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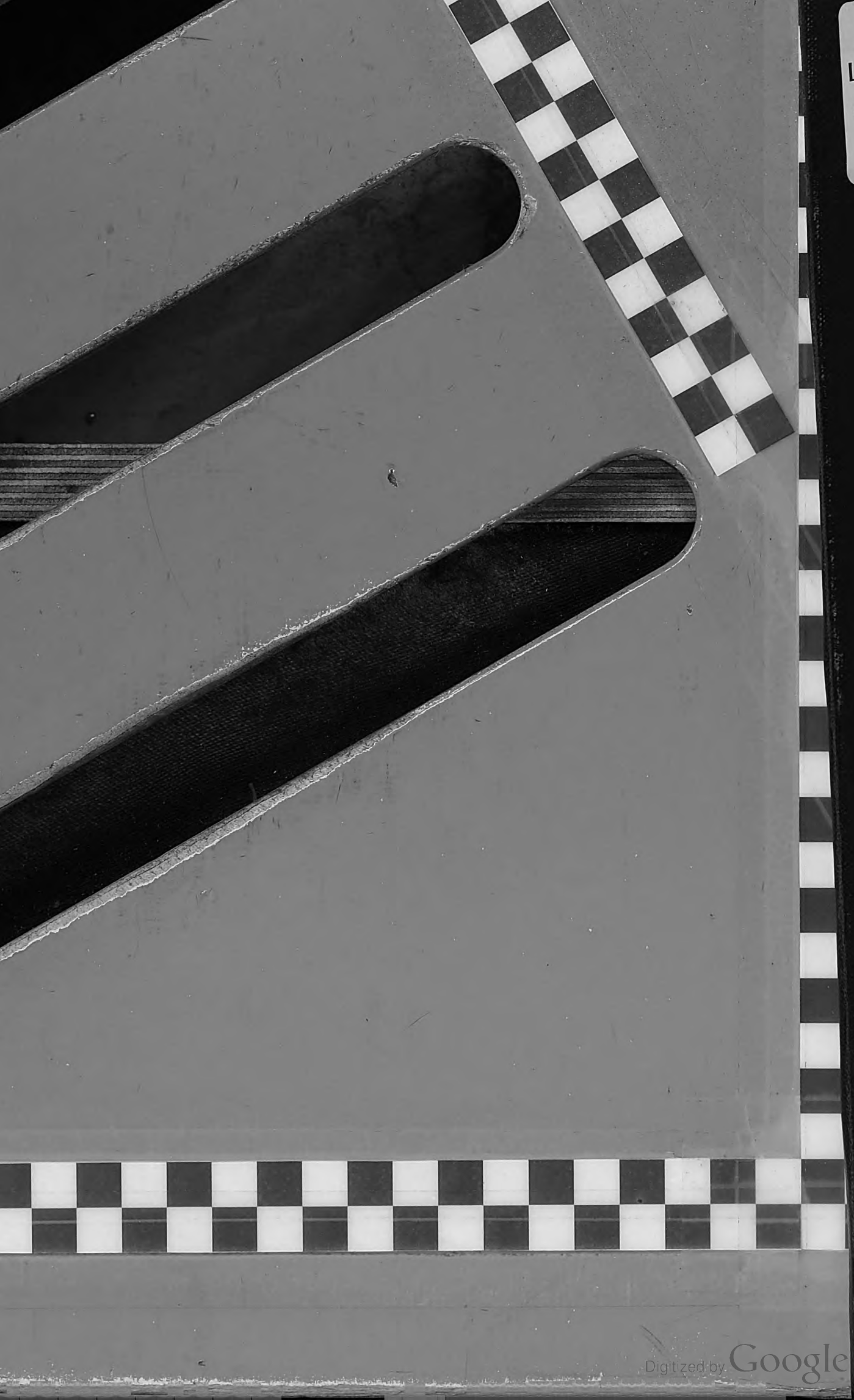

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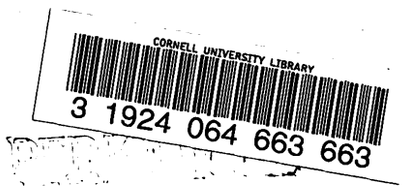

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Volume 72

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Getting the Most from the Inc

THIS is essentially a subject index, not an index of titles, and articles treating a number of different subjects are listed under each of them. In addition, a geographical reference is published wherever the article relates to any particular railway company, city, state or nation. Entries about an electric railway are under the name of the city in which the main office of the company is located.

In the subject index, the alphabetical method is followed. If there is a choice of two or three keywords the one most generally used has been selected, cross references being supplied. The headings which appear in the index itself are in small type under the general classifications. The main headings in capitals below do not appear in the index.

As an example of how to use the index, if a reader wishes to locate an article on special trackwork he obviously would look in the list below at the general subject "Track." Under this caption, only "Special trackwork" could apply to the article in question.

The large number of articles brought out on the monthly maintenance data sheets, together with the increasing number of maintenance notes in other issues has resulted in the substitution of three keywords, for inde formerly appearing under "Repair tice": (1) Maintenance data, un all articles appearing on the mont tenance data sheets are grouped; (tenance equipment, with classified under which all articles in the wee ment "New Equipment" are includ Maintenance practice, also with cl heads, under which all articles in department "Maintenance Notes," the articles on the data sheets, The heading "Repair Shops and has been reserved for general ar design of repair shops and their Otherwise the plan used for many y preparation of this index has been f

In addition to the groups of a ered by these headings, papers from railway associations are gr the names of the various organiz ceedings of other associations are indexed in general only i with the subject discussed.

Signed articles also are in name of the author. When t author is known to the read the simplest method of locatir

CLASSIFIED LIST OF KEYWORDS

ACCIDENTS AND ACCIDENT PREVENTION
Accident claim department
Accident prevention
Accidents (including wrecks)
Insurance, Fire
Safety work
Storm and fire damage

ELECTRIC CARS AND SERVICE CARS
Cars (including car design)
Locomotives
Service and tower trucks
Trackless trolley

CAR EQUIPMENT
Bearings
Brakes and compressors
Doors, car
Electrical equipment for cars (except motors)
Gears and pinions
Heaters, electric
Lighting and lighting fixtures
Motors, Electric
Seats
Trucks
Wheels and axles

EMPLOYEES
Education
Employees
Insurance and pensions
Labor
Strikes and arbitrations
Wage decreases
Wage increases
Wages and working agreements

FARES
Fare collection (including apparatus)
Fare decreases
Fare increases
Fares
Traffic investigations
Traffic stimulation

FINANCIAL, LEGAL AND STATISTICS
Accounting
Appraisal of railway property
Blanks and forms
Discontinuance of lines
Financial (methods of financing)
Financial reports
Franchises
Insurance, Fire
Insurance and pensions
Legal
Legislation for railways
Market conditions
Operating records and costs
Public service and regulative commissions
Statistics
Taxes

HEAVY ELECTRIC TRACTION
Heavy electric traction (general)
Locomotives

MAINTENANCE OF EQUIPMENT
Car cleaning
Lubrication
Maintenance data
Maintenance equipment
Maintenance practice
Maintenance tools, Suggestions for
Motor buses, Operating practice
Painting
Repair shops and equipment
Stores
Tests of materials and equipment
Welding

MOTOR BUSES
Motor buses, design
Motor buses, gas-electric
Motor buses, installations
Motor buses, jitney competition
Motor buses, Operating practice
Motor buses, regulation

POWER
Energy checking devices
Energy consumption
Fuels

POWER—Co
Overhead contact sy
Power distribution
Power generation
Power stations and e
Power transmission
Substations and equi

STRUCTURE
Bridges
Carhouses and storage
Loading platforms
Power stations and eq
Repair shops and equ
Substations and equip
Terminals and waiting

TRACK
Pavements
Rail joints and bonds
Rails
Special trackwork
Ties
Track construction
Track maintenance

TRAFFIC AND TRA TATION
Advertising
Dispatching
Freight and express
Interurban railways
Merchandising transportation
Parking of cars
Publicity
Public, Relations with
Rapid transit (elevated and subway)
Schedules and timetables
Signals
Street traffic congestion
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MISCELLANEOUS
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Management
Noise reduction
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Railways (general)
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Standardization
Wood preservation

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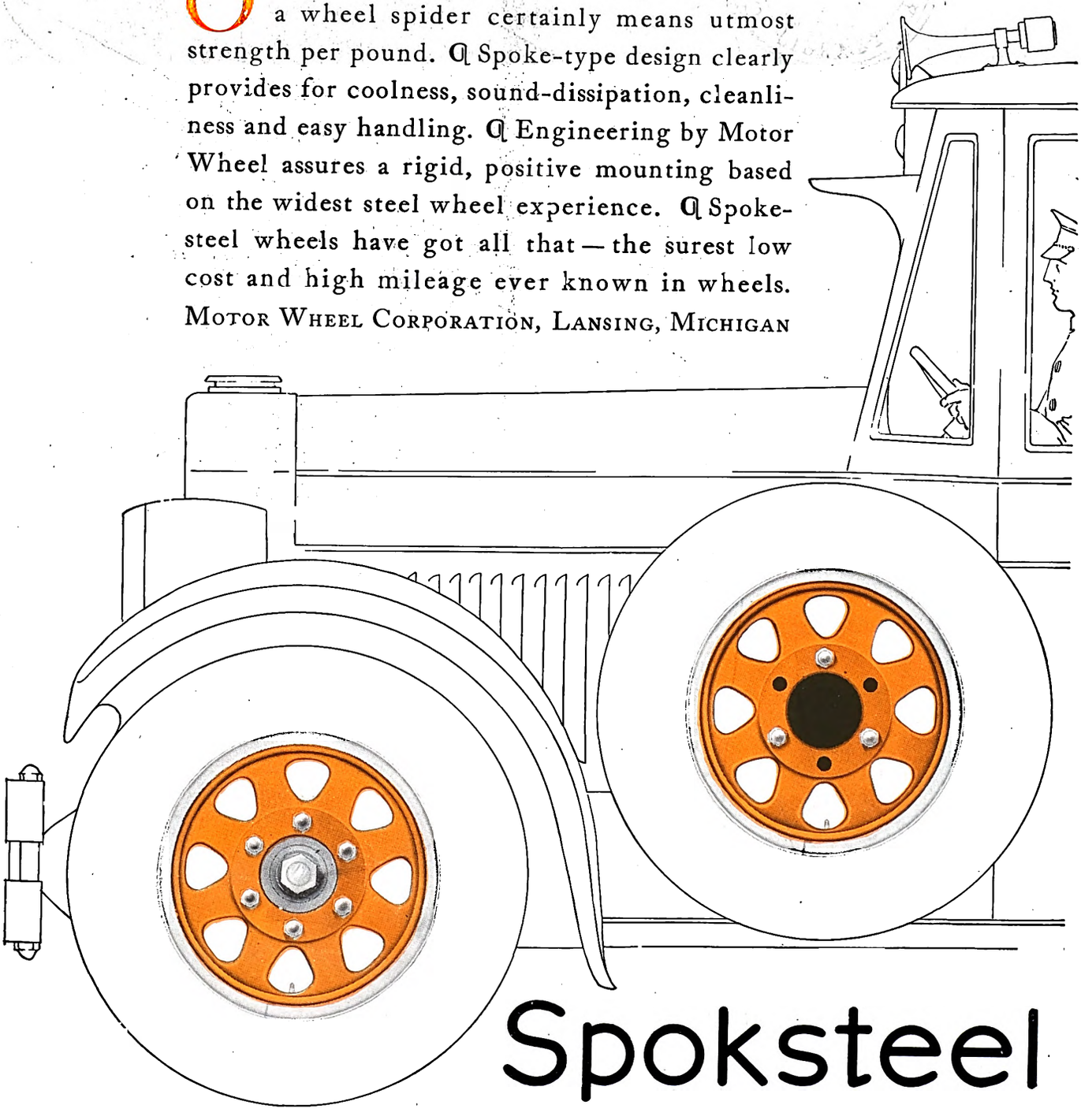

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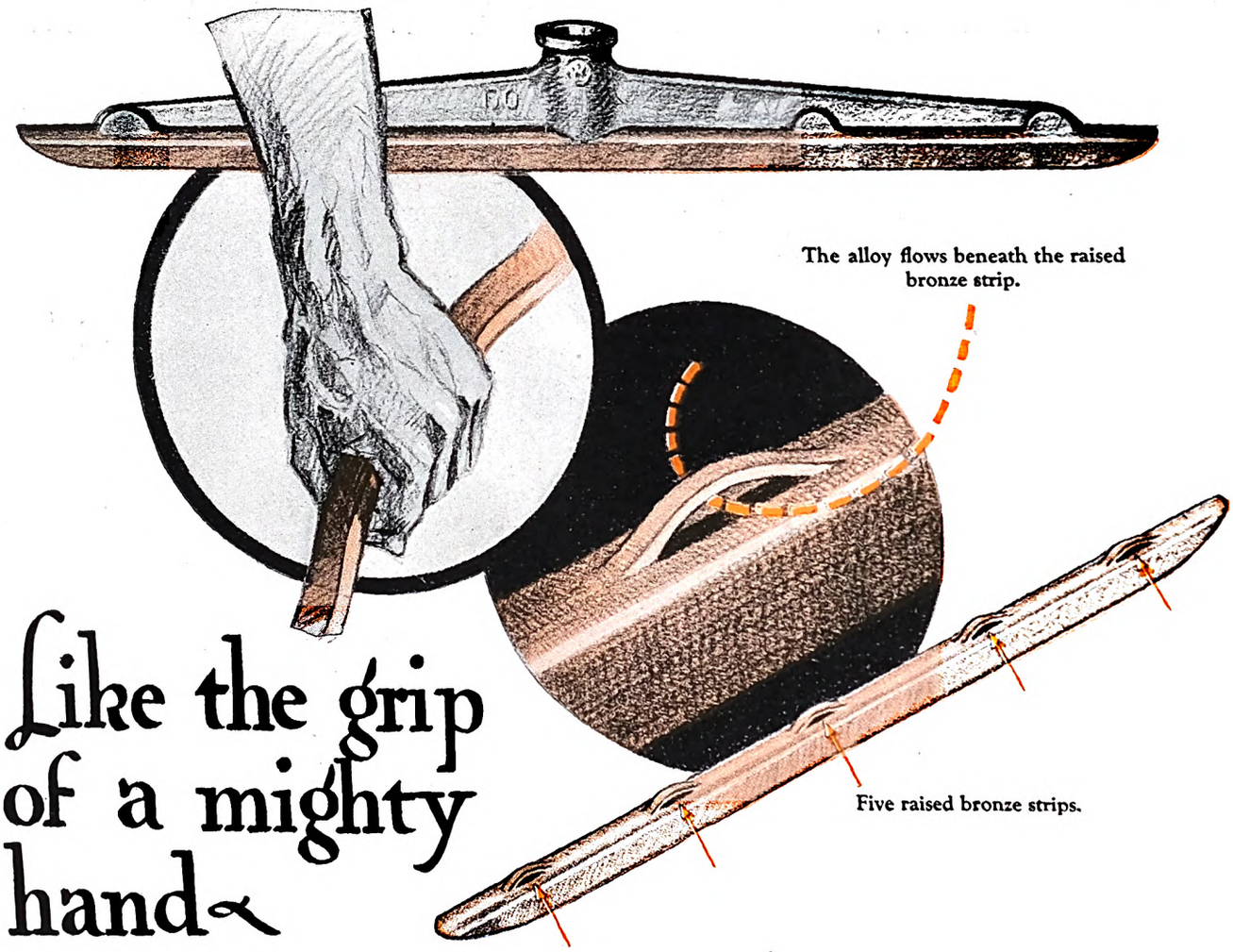

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Electric Railway Journal

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JAMES H. MCGRAW, *President*

Consolidation of Street Railway Journal and Electric Railway Review
CHARLES GORDON, *Editor*

LOUIS F. STOLL,
General Manager

Volume 72 — New York, Saturday, July 7, 1928 — *Number 1*

ELECTRIC RAILWAY JOURNAL is a consolidation of *Street Railway Journal* and *Electric Railway Review,* effected in 1908.

In November, 1884, *Street Railway Journal* began publication, having been started a few months earlier as the street railway department of the *Journal of Railway Appliances.* The new paper was edited during various periods by Robert Grimshaw, George L. Fowler, Emerson P. Harris, C. B. Fairchild and Edward E. Higgins.

In May, 1908, *Electric Railway Review* was purchased and consolidated with *Street Railway Journal* to form ELECTRIC RAILWAY JOURNAL. Henry W. Blake, who joined the staff of *Street Railway Journal* in 1891 and in 1894 became its editor, continued as the editor of ELECTRIC RAILWAY JOURNAL until 1925, when he was made senior editor. Harold V. Bozell was co-editor from 1920 to 1922 and Harry L. Brown was co-editor from 1923 to January, 1925. Charles Gordon became editor in February, 1926.

The present staff is as follows: Editor, Charles Gordon; managing editor, Morris Buck; senior editor, Henry W. Blake; editorial staff, John A. Miller, Jr., Clarence W. Squier, George J. MacMurray, C. A. Faust, J. W. McCloy and L. H. Church (Chicago). Paul Wooton is Washington correspondent and Alex. McCallum is London editorial representative.

Signals Should Move Traffic, Not Stop It

LOSSES through traffic delays amounting to some $540,000,000 in the city of New York alone form a staggering record of the inefficiency in our methods of handling one of the nation's most pressing problems. Its importance was brought out at the recent meeting of the New York Electric Railway Association in the paper by John A. Miller, Jr., and the discussion by H. S. Simpson. This enormous sum, which is greater than the total annual expenditures of several European and Latin-American governments, also exceeds the budget of New York City by $28,000,000. What the total sum for the nation is when all the cities of the country are taken into account can well be left to the imagination.

Whenever traffic control lights are installed with little study as to their adequacy, but merely to save the salaries of policemen, the citizens more than pay for what the city administration thinks it has saved. As a writer remarked in Detroit, when a senseless mechanical contrivance winks its illuminated eye and keeps thousands waiting for no purpose, the value of the thing is indeed questionable. It is more than that; it is vexatious and wasteful.

Three kinds of control are in general use. These are the synchronized type, in which all lights for an entire street show green for a given period and then red for a given period; the wave or platoon system, which is similar to the former, all lights changing at the same time, but in which alternate signals or groups of signals give different indications, and the co-ordinated lights such as have been installed on certain streets in Chicago and Cleveland, carefully adjusted to the needs of each intersection. The value of the last was attested by Mr. Simpson when he stated that its installation in Chicago, together with the no-parking restriction in the Loop area, has done far more to alleviate traffic congestion there than the very much more expensive and much talked about $22,000,000 Wacker Drive improvement. Expensive and visionary double and triple-decked street projects appeal to the popular imagination, but it is through intelligent utilization of existing street facilities that the greatest improvement in traffic movement will come.

From the General to the Specific in Employee Training

SALES training of platform employees has been for several years the subject of discussion among electric railway executives. Much of the expressed thought on this important phase of the local transportation business, however, has been in broad generalities bordering dangerously on platitudes. Little progress seems to have been made in the definite application of "transportation selling" talk to the daily performance of the man on the platform.

All this is not to say that the industry has made no progress in the important matter of better-trained employees; quite the contrary. In the very fact of the wide attention that has been given the subject is the best possible evidence that the industry recognizes, as it has probably never recognized before, the enormous power for good or evil of the daily contacts between its employees and passengers. Merely the general recognition of their importance is in itself substantial progress.

Nevertheless, the fact remains that the expressions, "merchandising transportation," "selling service," "making salesmen of platform men" and similar phrases, have had little interpretation into daily performance on the platforms of local transportation vehicles. For this reason there is more than passing interest in the thoughts expressed by Clinton D. Smith of Cleveland and R. N. Graham of Youngstown, at the recent meeting of the Central Electric Railway Association. Mr. Smith drew a clear distinction between the several branches of personnel work—ranging from selection and routine training to welfare activity—and the specific matter of sales training. In Cleveland a separate division of the personnel department has been established to deal exclusively with sales training.

Mr. Graham, on the other hand, endeavored to define the kind of selling which the platform man has the opportunity to perform. His analysis led to the conclu-

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sion that unfailing courtesy to passengers is the highest form of transportation salesmanship, and that specific training to make men more adept at handling difficult situations on a car platform is entirely feasible and necessary.

These views seem to represent distinct forward progress in thought on employee training. They suggest that there are several alternatives in the procedure for training better platform men. As an initial step he may be "told to be" courteous. In too many instances this represents the total extent of training activity on some railway properties. Then again, he may be "told how" to be courteous. Some properties have gone that far. But before the average man may be expected to make much definite improvement in his manner of handling passengers, he must be "shown how" to be courteous by actual reproduction in training of the situations which he is called on to meet in service. If that be true, the industry still has considerable room for improvement in its training methods.

New Basis for Cleveland Suburban Riders

TWO significant things have occurred recently in Cleveland. These are the decision of the arbitrators in the East Cleveland fare dispute and the suggested trial of the zone system. The fare differential in the East Cleveland case is fixed at 2 cents, but the two occurrences are linked since the zone suggestion, made by the Cleveland Railway to the Council, followed a recommendation of this kind by the arbitrators in their findings in the East Cleveland case. So far as East Cleveland is concerned, that matter is settled, but there still remains the question of dealing with the fares to Cleveland Heights and Lakewood. It seems unlikely that the Council will consider the zone proposal seriously unless some arrangement is made to put the higher fare into effect in the suburbs just mentioned.

The 2-cent differential, however, is more than tangible. It is a fact. As the Cleveland *Plain Dealer* sees it, the decision of the arbitrators in the East Cleveland fare dispute is far more important than the number of car riders or the amount of money involved might indicate. It is likely to set a precedent that will control the fare question in other important suburbs. This means progress, since the arbitrators' decree in the East Cleveland case marks the first acceptance in principle of a recommendation made by the Metropolitan Transportation Commission three years ago that changes be made in the Tayler ordinance calculated to strengthen the finances of the company and to enable it to serve the public better.

Several of these recommendations were adopted, but the proposed fare differential between Cleveland and the suburbs long remained merely a topic of discussion. In substance, the proposal was that new franchises be negotiated with Lakewood, East Cleveland and Cleveland Heights whereby each would agree to pay the prevailing Cleveland fare plus 1 cent for a through ride. The arbitrators in the East Cleveland case went farther than the commission proposed and fixed the differential at 2 cents. This means that East Cleveland passengers will pay 9 cents for a ride to Cleveland. The supposition is that the other suburbs will be asked to fall in line on a similar basis. No matter what may come out of the zone proposal, it remains a fact that the East Cleveland settlement has the obvious virtue of being a painstaking attempt to put suburban transportation at Cleveland on a real service-at-cost basis.

The Manufacturer's Responsibility for Repair Parts

RESPONSIBILITY for the operation of a piece of apparatus rests with the original builder, according to E. C. Brandt, speaking before the New York Electric Railway Association last month. The main business of the railway is selling rides and transporting the passengers. When a vehicle is tied up for repairs it is imperative that everything should be done to get it back on the road as expeditiously as possible. This, he holds, is the reason why in some shops the repair is made with whatever part is at hand and why on other systems the railways turn to the home manufacture of their own maintenance parts.

As Mr. Brandt sees it, it is to the advantage of the railways to have renewal parts furnished by the original supplier in that he can furnish standard maintenance data, information and engineering service as well. Every large manufacturer and many of the smaller ones have the equipment and facilities to furnish promptly repair parts both of high quality and particularly suitable for use with the original apparatus. The manufacturers can reduce their costs of making parts and at the same time give better service by the development of a renewal and maintenance parts department where all of their customers' requirements can be centralized in one place to insure quantity production. Since the original manufacturer of any equipment cares more about the performance of his product than does anyone else he is anxious to see that the customer has the best of renewal parts and service. This can be made possible only by reference to the drawings, specifications, materials and engineering used in the original apparatus.

The underlying cause of home manufacture of parts, according to Mr. Brandt, is that the manufacturer has shirked his responsibility. All renewal parts should be standardized as to sizes, materials and specifications in a manner similar to new parts. Parts with over and under sizes must be standardized as well as those of original dimensions.

In its final analysis the renewal parts problem is largely attributable to the manufacturer's failure to understand adequately the operator's requirements.

Track Resiliency and Its Effect on Noise

THIRTY years ago, in laying its underground conduit track, the Third Avenue Railway, New York, inserted a small leaf spring between the base of each rail and the seat in the yoke on which the rail rested. The purpose was to produce a resilient track. The springs soon flattened out under the weight of the traffic on them and became useless. Although the experiment was a failure, it is noticeable that even in those early days the advantages of resiliency in track were recognized.

European tramways have done more in this direction than electric railways here. This is undoubtedly one reason, though not the only one, for the quietness in operation of European street cars mentioned by many returning travelers. An article in the June 16 issue of ELECTRIC RAILWAY JOURNAL told how Cologne obtains resiliency. The rails rest on a base of asphalt composition, $1\frac{1}{8}$ in. thick and $7\frac{3}{8}\frac{3}{2}$ in. wide, or the width of the rail base. Much the same construction is used in other cities in Central Europe. In Paris, where the form of track construction used calls for iron chairs embedded in

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concrete to hold the rails, a block of Chinese teak wood, ½ in. thick, is inserted between the base of the rail and the chair. The purpose of this block, like that of the asphalt in Cologne, is to provide a more elastic support than if the rails were held rigidly. The author of the article on the Cologne construction says that on track laid in this way corrugations almost never develop in service. More quiet operation is a by-product.

If those who are seeking more quiet car operation are fearful of the expense involved in a flexible rail base, there are other means of noise reduction which are not so expensive. Observers of European practice have listed the following as among the reasons for the more quiet operation of street cars in Europe than in America: better maintenance of track and cars, slower speed of cars, greater use of wood in car construction, extensive employment of fixed window sash, fewer car parts to get loose, more general use of flange-bearing special work and more thorough greasing of curves. European managers may have a great deal to learn about certain features of American electric railway practice, but there is also much of benefit which could be obtained from European practice. Some of the methods listed above for noise reduction may not easily be applied or be appropriate here, but there is no valid excuse for poor maintenance of cars and track. It is one of the lessons we can learn from Europe.

Conserving Man Power

FEW persons realize the extreme importance of thorough and regular physical examinations in conserving their own lives and keeping in the best of health. Neither do the managements of transportation companies always appreciate the value of such examinations in conserving the man power of a system and protecting the public.

Whether the work of the car or bus operator is more exacting than the corresponding work of 30 years ago is a question. Certainly the mechanical devices that have been introduced have taken away the necessity for heavy manual labor which at one time was demanded of the motorman. The old requirement that the operator stand while on duty has almost entirely been done away with, and the touch of a finger will actuate practically any of the devices. On the other hand, years ago when the automobile was a luxury and few were seen on the city streets there was no traffic problem such as we know today. Certainly a keener eye and a quicker hand are essential now. Whether the working life of the average motorman today is greater or less than that of the motorman of twenty years ago cannot be proved. But it is more essential that there be no man failure on duty.

As yet there is not a general realization among electric railway executives that a rigid physical examination is essential as a requirement for employment. Even several railways that maintain medical departments do not consider it of prime importance and few of those which demand physical excellence for applicants give health rechecks at regular intervals. The importance of doing this was stressed by Dr. W. L. Weber of the Pacific Electric Railway in a recent paper before the California Electric Railway Association. His company has found through this system that a certain small proportion of men are suffering from serious maladies. Most of these are curable through proper treatment, and the few men who should not be allowed to take the lives of passengers in their hands through physical unfitness are transferred to positions where they can be useful parts of the railway system and of the community.

It is this desire on the part of the management to conserve the men as well as the patrons that has removed the usual attitude of opposition. There is still a certain prejudice against physical examinations on the part of the average man and it is likely to be accentuated when there is a possibility that his job will be lost as a result. But opposition will give way to co-operation when the individual realizes that not only may his health be conserved and perhaps his life be prolonged, but that he will be continued in employment to the best advantage of his employer and himself.

Milan Adopts American Ideas in Cars and Fare Collection

AMERICANS can hardly realize the importance attached by European tramway managers to the decision in Milan, Italy, to change the system in that city to prepayment collection of fares. The practically universal practice abroad has always been hand collection and the issue to each passenger of a printed receipt for the fare paid. Use of this receipt, which is retained until the passenger leaves the car, had some justification with zone fares because it recorded the distance for which the passenger paid to ride. But with a flat fare—and many of the large city roads on the continent of Europe charge a flat fare now—the reason for the fare receipt, except as a means of auditing the conductor's collections, has largely disappeared. For auditing purposes, the fare box and register possess many advantages over the paper receipt.

But Milan is going much farther in its modernization policy than simply to introduce prepayment and abandon fare receipts. It has put in regular service two modern pay-pass cars, and they have met with such popular approval that 460 more are to be built. It is expected that by 1929 all the obsolete cars in Milan will be retired and shortly thereafter all cars in Milan will be of the pay-pass type. An interesting fact has been that many leading European managers, returning from the Rome convention, had an opportunity to inspect this pay-pass operation. It may thus be the precursor of like changes elsewhere in Europe.

It is appropriate that a step in advance such as this should have been undertaken in Milan. Northern Italy has always been noted for its industrial enterprise and achievement, as well as for the pioneer work which it has done in many branches of electrical engineering. It is of greater importance that a decision in favor of modernization of all the rolling stock should follow as a natural consequence closely after the selection of a model. Good electric railway service is considered in Europe as essential to public welfare, even more so than it is in this country. This view of the importance of electric railway transportation to the public was emphasized by Premier Mussolini in his address at the Rome convention. In spite of the great development of bus transport in Europe—it is at least as extensive as here—the fundamental fact is recognized that electric railways are still the cheapest means of mass transportation in cities as well as the most economical in the amount of street area used per passenger carried.

Americans should be gratified at the compliment accorded them through the frank adoption in Milan of American rolling stock designs and fare collection methods on so large a scale.

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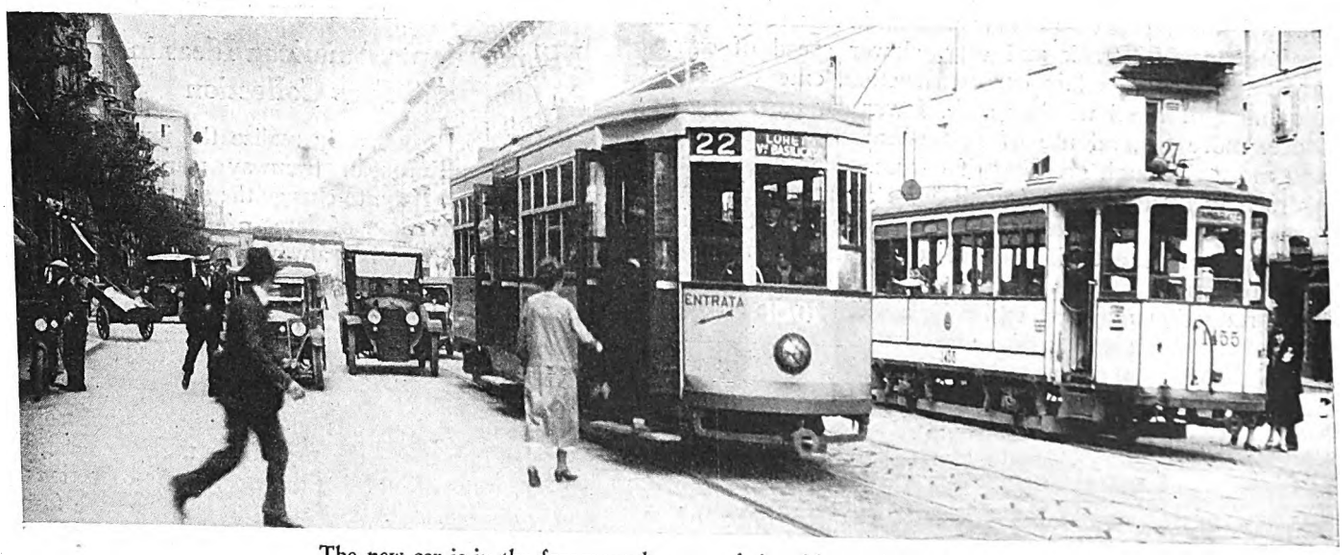
Milan Adopts Pay-as-You-Pass Cars

Large Italian city will retire all obsolete cars by end of 1929 in favor of this type. Fare boxes and registers replace paper receipts. Other features of American practice followed. Innovations attract attention of delegates returning from Rome

By Marquis Ferdinando C. Cusani
Milan, Italy



The new car is in the foreground; a car of the old type is at the right

Marquis Cusani has long been interested in electric railways and was a member of a commission which visited the United States in 1921 to study American operating practice. In his early life he was a resident of the United States while his father was Ambassador at Washington from Italy. The F. C. Cusani Company of Carate Brianze, Italy, of which he is the head, has built all-steel bus bodies for service in Milan. Its principal business is the manufacture of fire extinguishing apparatus.—EDITOR.

MILAN, a city of 1,000,000 people, the industrial capital of Italy, has always been in the forefront in the adoption of modern methods in its public utilities. 'Way back in the early '80s, the first Edison electric illuminating company to begin operations in Europe was organized in Milan, by Milanese shareholders. It has since developed into one of the most powerful superpower systems of all Europe. A few years later, as soon as the early positive experiments of street railway operation by electric power had met with success in the United States, Milan started planning one of the most extensive and up-to-date traction systems. For a long time it was considered as the best and cheapest in Europe.

At a time when a car ride in the United States sold for 5 cents, you could stop a car anywhere on a street of Milan, pay a fare of 2 cents (1 cent in the morning rush hour) and get off anywhere you chose, as cars, at that time and up to 1916, had no fixed stops.

The change in money values brought about by the war did not affect the fares very much. In fact, during certain periods the fare, translated into dollars, was practically less than the pre-war rate. But through all difficulties the Milan Tramway management stuck to its one unchangeable rule: a universal straight fare with a universal half fare during the morning rush hours.

No better field could be found for the introduction of American operating methods, and it took only the advent of a general manager whose broadmindedness should grasp the enormous advantages to be gained by the abandonment of quaint old-fashioned European operation and the substitution of the latest and best American practice, to effect the change.

The Milan Municipal Tramways, a city-owned utility, operated as a distinct unit from the other city utility services, at the end of 1926 found itself in front of obstacles that looked much like a blank wall. These were the conditions:

Many lines filled to capacity and the public clamoring for more service.

A central loop system whereby most all of the lines converged at Cathedral Square into a maze of tracks out of which it took minutes for the cars to clear themselves.

The cumbersomeness of operating two-axle motor and trail-car trains, employing three men per train.

The existence of a number of new two-axle cars weighing more than 13 tons that kept merrily hammering away all the track on the busiest routes.

Continuous power breakdowns due to the overloading of the distribution system.

Such were the difficulties with which the new general manager of city transportation, Gaetano D'Alò, was called to cope right away, in front of a clamoring public opinion and of the pressure brought to bear upon the

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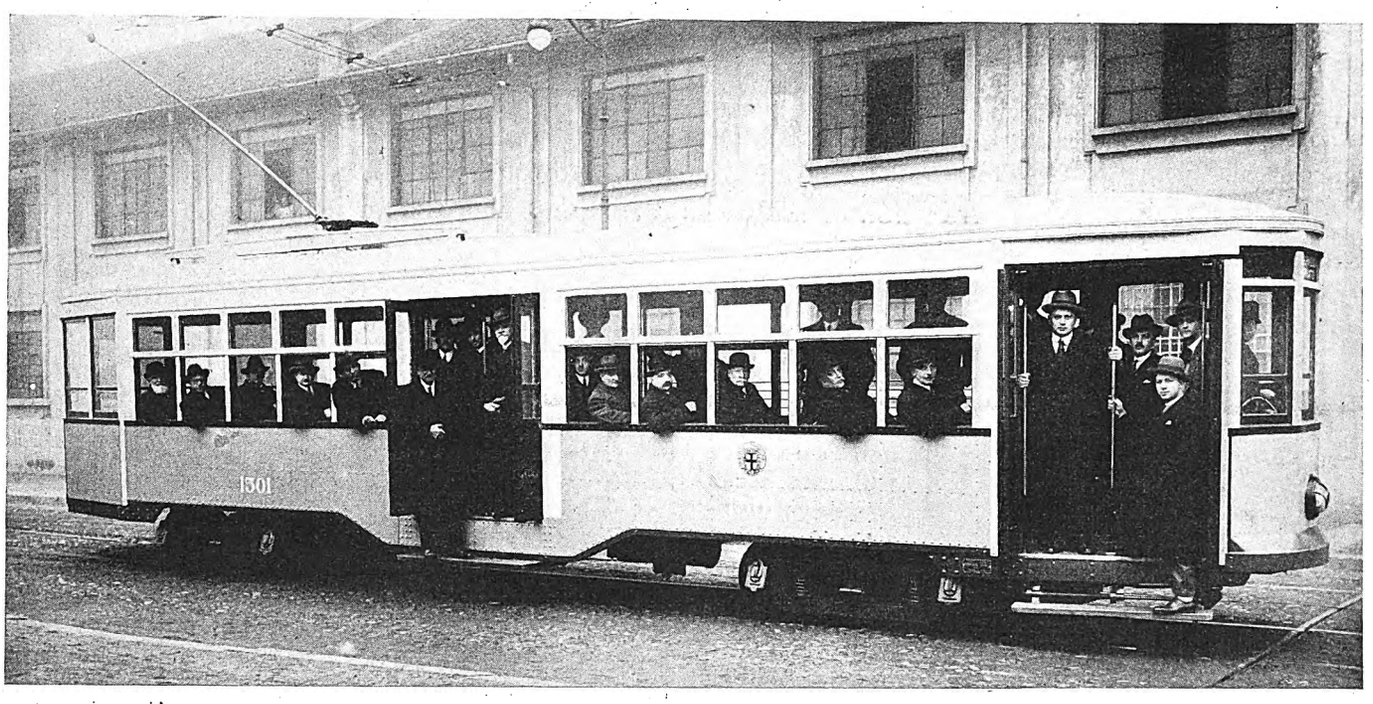


The Rotary Club of Milan accepts an invitation to ride on the new car

Municipal Tramways by all public bodies for a radical change and improvement in the city transportation system.

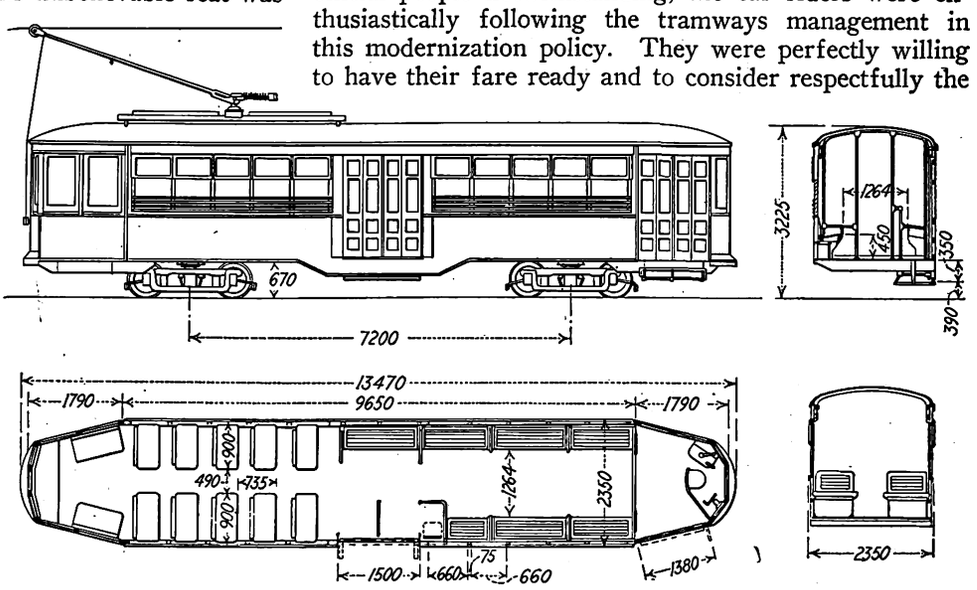
The first sweeping change was brought about during the last two months of 1926 by the complete rerouting of all car lines and the abolition of the Cathedral Square loop. The rerouting plan was prepared by Giovanni Cuccoli, engineer of the tramways corporation, under special instructions from the general manager and in accordance with the latest American practice, as set forth by ELECTRIC RAILWAY JOURNAL.

The problem had become so acute that Premier Mussolini had already taken a hand in the proceedings. Understanding that the only way out was a complete rerouting, he had given instructions to the Hon. E. Belloni, city manager of Milan, that the plan suggested by General Manager D'Alò and Engineer Cuccoli should be completely accomplished within two months.

Details of the way in which this unbelievable feat was completed in less than the specified time have already been given by Mr. Blake in the issue of ELECTRIC RAILWAY JOURNAL for July 2, 1927. But after the rerouting had been finished the difficulties facing the system were by no means over. The rerouting had practically given a 25 per cent increase in car-miles with the same number of cars, but this was really only a drop in the sea of transportation requirements. A very difficult condition with which the Milan Tramways has to cope is the existence of four rush periods each day, due to the fact that mostly everybody goes home to lunch at noon. This means that many more cars must be kept in service during long hours than would otherwise be needed and makes necessary the employment of a much greater force for trainmen.

Early in 1923 the Lombard Electric Traction Company (which operates quite an extensive system of interurban lines around Milan) had begun operating double-truck motor cars arranged for "pay within" fare collection on some of its suburban lines. Although the conductors still had to sell tickets and make change, owing to a rather complicated system of zone fares, the experiment had met with signal success.

The first move of Mr. D'Alò was therefore to borrow some cars from the Lombard Electric Traction Company and put them in service on the city lines to ascertain the feasibility of double-truck prepayment operation and the reaction of the riding public to the proposed new method. After only a few days of experimental service it became quite clear that, the contrary opinion of many official people notwithstanding, the car riders were enthusiastically following the tramways management in this modernization policy. They were perfectly willing to have their fare ready and to consider respectfully the



In spite of the limitations on over-all width imposed by narrow streets, the designers have been very successful in caring for the comfort of passengers. Dimensions in this drawing are in millimeters

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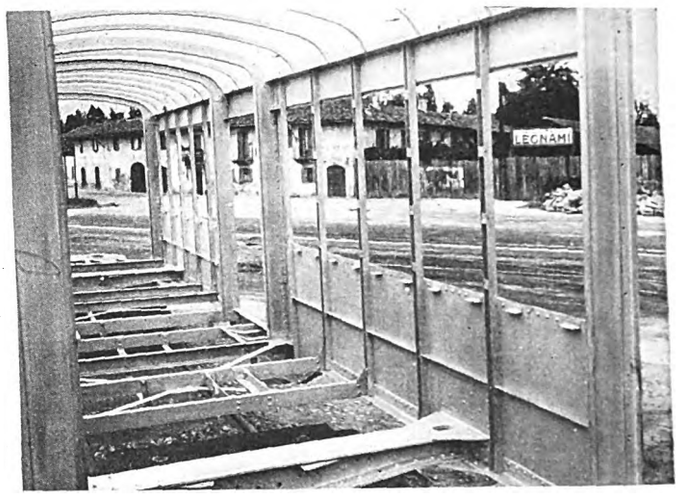
controlled doors and steps which had been fitted to some cars in an experimental way.

Pay-as-You-Pass Type Selected

The tramways management having decided to introduce double-truck prepayment operation, Mr. Cuccoli was set to work designing an appropriate type of all-steel light-weight car which should strictly conform to American standard practice, when during the spring of 1927 Henry W. Blake, senior editor of Electric Railway Journal, in the course of his trip through Europe was fortunately brought into contact with the Milan tramways management. After an accurate, if short, examination of the conditions governing rapid transit in Milan, he recommended with Mr. D'Alò that the "pay-as-you-pass" car be adopted as standard, that tickets be dispensed with and that fare boxes and registers be substituted.

The public soon learned to like the interior arrangement and method of paying fare

The strength of his arguments was such that Mr. D'Alò was not only able to impress upon the City Manager the necessity of building some cars of this type for experimental purposes, but in fact won the battle for pay-as-you-pass operation by removing the last semblances of zone fares and introducing the strictest policy of "only one fare for any ride on a municipal street car." Flat fares had been practically the standard before, as already explained. Engineer Cuccoli was again asked to work out a complete design of a pay-as-you-pass car which would follow all constructional standards that had been already fully proved in American operation and that would fit track and traffic conditions in Milan. The cars hitherto operated in city service had a maximum outside width of 7 ft. 1½ in. Therefore, both the devil strip on straight double track and the clearance in curves were in many instances entirely too small to allow the operation of two cars with a width sufficient to accommodate four crosswise seats and a center aisle, which were considered as absolutely essential in a car of the "pay-as-you-pass" type. The method resorted to in some American cities of building the car bodies off center on the trucks would not have been a fitting solution, as in a number of streets where the distance between tracks was ample to clear two cars in opposite directions, the vehicular lane on the outside would have been narrowed to a point where the operation of a moving vehicle between a street car and a parked conveyance would have been dangerous.



The framework during construction

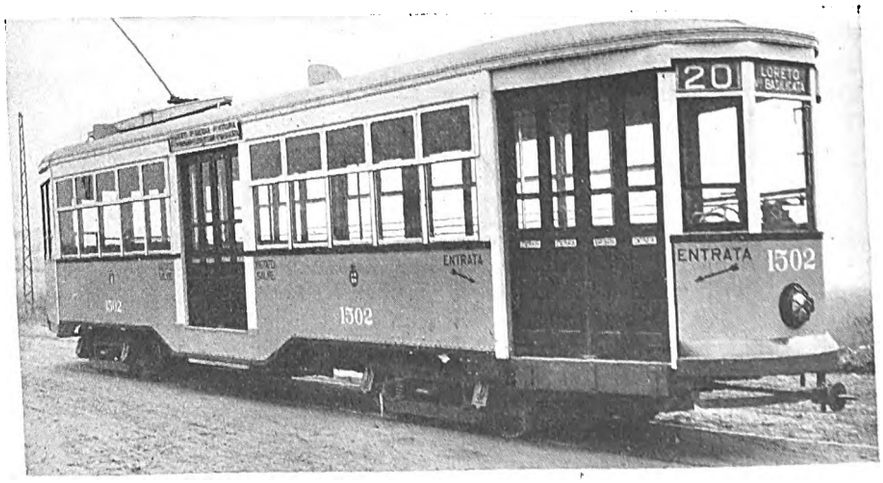
A careful survey of the whole system showed that a complete realignment of track would be, after all, the best course to follow, as it would allow the design of cars of greater capacity. The expense, which at first appeared as rather heavy, was practically reduced to a much smaller amount, as in many cases budget allowances had already been made for ordinary track renewal in the sections considered.

As soon as it was ascertained that a "pay-as-you-pass" car with a maximum outside width of 7 ft. 8½ in. could be operated on all municipal lines after the changes in track previously outlined, the work of designing such a car was pushed through.

Owing to the very peculiar conditions under which this experiment was to be started, the management decided to use only such equipment as had been developed for this particular design in America.

American Construction Practice Followed

Cast-steel frame trucks of the St. Louis pattern, pony motors and all other details of car equipment were ordered from the United States, not in the belief that Italian manufacturers could not make them, but because the American designs had been evolved after years of



The new pay-pass car at Milan is of distinctly modern design with entrance and exit and power operated doors and steps

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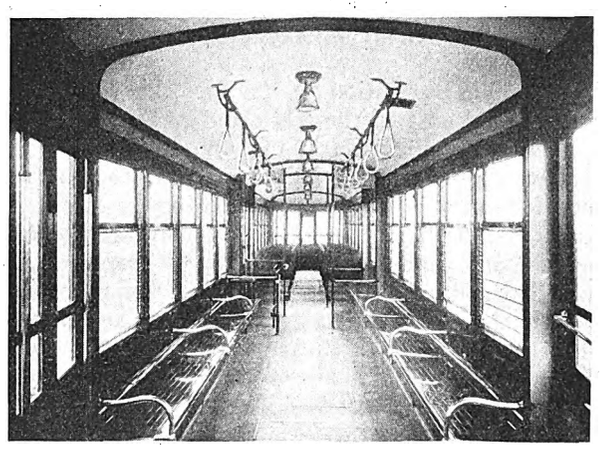
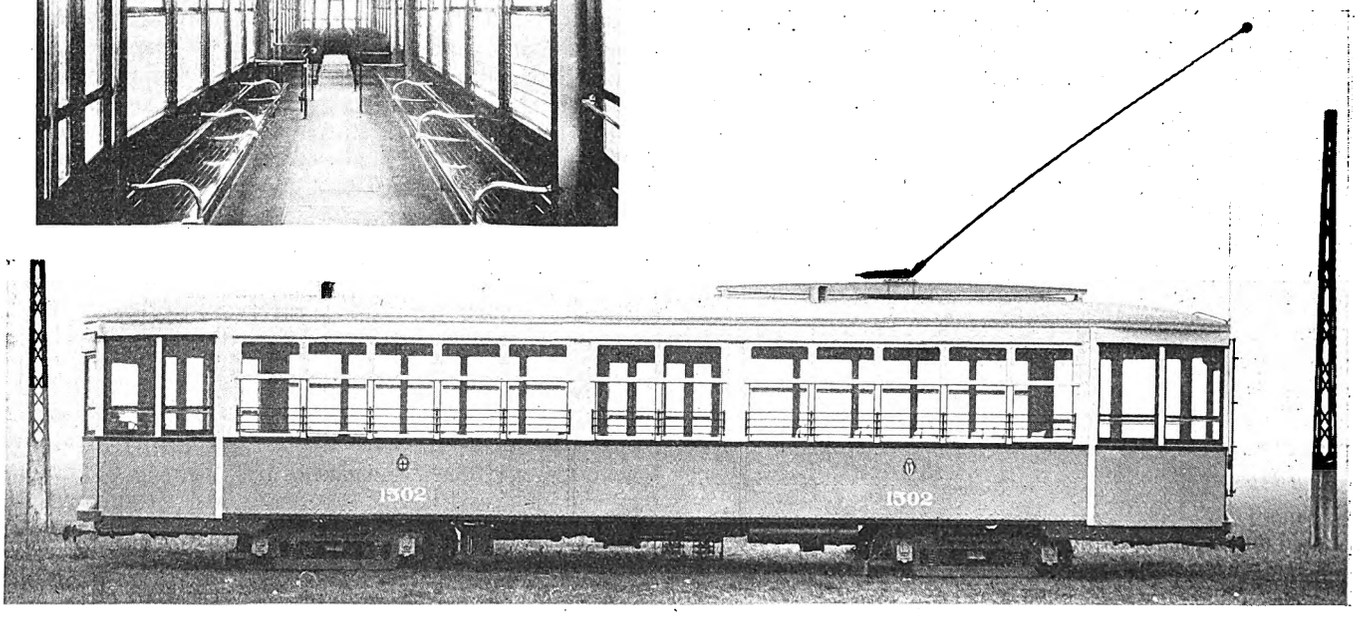
experience in pay-pass operation, and there was not sufficient time to design something special which would have to be submitted to prolonged tests before it could be put in actual public service.

The Italian General Electric Company and the C.E.M.S.A. Company, representing the Westinghouse interests, put their organizations at the disposal of the Municipal Tramways. In fact, they acted as the purchasing agents in America of the tramways system in order to speed up the construction of the first cars. The car bodies were built under the personal supervision of





The pay-pass car just put in service in Milan is a notable innovation to the usual European practice in cars and trucks. Its lines give it a pleasing appearance

Engineer Cuccoli at the Carminati & Toselli Company Car Works in Milan, and were finished within five months from the date of the order.

This may be considered as a record feat, when one realizes that these were the first two cars in all Europe ever to be built strictly in accordance with American car building practice and were produced by engineers, draftsmen and workmen who had never been in America, had never seen an American car and had never built anything similar.

Rotary Club Invited to Ride

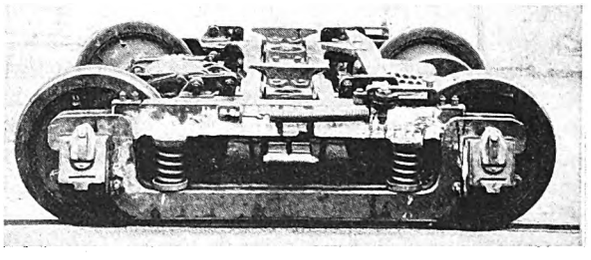
On Nov. 29, 1927, car 1501 was put through its first running test and on the next day the Milan Rotary Club was invited by the tramways management for an extended ride.

The members, among whom were many technical men, were astonished at the comfort, easy riding qualities and absence of noise of the cars and especially at the quick acceleration and braking rates which were possible without any discomfort to the passengers. They pronounced the car a wonderful step in the development of transportation facilities.

Within a few days the car was put in public service. In so doing, the management took a step which required a lot of courage, but proved, to the absolute exclusion of any doubt, that the cars could easily perform everything that was required from them. The difficulties to be met were more of a psychological than of a technical nature. The people who had only a superficial knowledge of the situation had decreed that the introduction of this system would meet with a signal failure, but the tramways management, being not devoid of a certain sense of humor, thought that if it could just throw these cars in the midst of an unsuspecting public without any dire results, the problem would be solved.

Public Likes New Cars

Therefore, car 1501 was started in service just after a one-hour tie up on the most important line. Although it was taken by storm, at the first stop, the results were



very gratifying and such as to allay any further fears of lack of success. The public of Milan was perfectly willing to adopt the new type of car. In fact, it would patronize it under all circumstances possible. People would even let an earlier car pass by in order to wait for the new ones. The public's co-operation was such that passengers would instruct their fellow riders on how to board, alight and pay fares, feeling that it was in their interest to follow the management's move for better transportation.

After six months it has been found that the cars came up to all expectations. The public has thoroughly understood how to get aboard and how to leave the car, and it has completely followed the idea of Mr. Witt that it is much more comfortable to ride on an upholstered cross-seat than on a lengthwise one.

Conductors were supplied with coin changers of the

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type commonly used in America, and within a few weeks Johnson fare boxes with International registers will be installed, doing away with the use of tickets. This is certainly an epoch-making step in Europe, as it goes against all the time-worn practices of issuing a ticket for each fare paid.

Cars Attract the Attention of the Conventionists from Rome

During the first months in service, the experiment was not brought to the attention of operating officials outside of the city as it was thought that the cars had to prove their merits before being talked about, but, after the close of the recent International Electric Railway Convention in Rome, many of the delegates made it a point to visit Milan and were astonished at the wonderful performance which the cars were giving. It can certainly be surmised that many an engineer is now going back home thinking that it takes not only knowledge, but pluck, to operate electric railway transportation systems in a modern way.

260 Cars Ordered, More to Follow

In the meantime the Milan Tramway management, on the basis of data gathered during the operation of the experimental cars, could easily figure out that an enormous saving in operating expenses could be reached by their wholesale adoption, and the City Manager was brought to the decision of ordering, right away, a first lot of 260, soon to be followed by a second lot of 200 cars. This will allow for the retirement of all the obsolete cars during 1929, and it is probable that within a further short period all the thousand-odd cars in operation in Milan will give place to those of the pay-as-you-pass type.

Americans who are not conversant with the various and often quaint methods of street railway service in Europe cannot appreciate the extent of a reform which has swept away all sorts of zone fares and tickets, which has introduced a car which promotes safety, speeds up the service and lowers enormously the expenses of operation.

To them it will appear just as a thing which is all in the day's work, but to the European, accustomed to the slowness, the high steps, the grab handles onto which all the male population could hang for dear life, and to the mixed blessings of a zone fare and of the conductor's feet marching on the passengers' corns, this appears as something revolutionary.

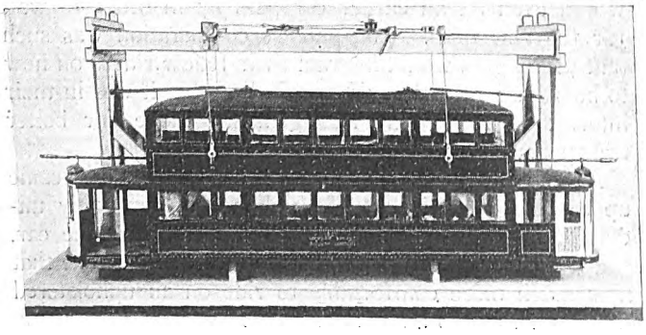
The Milan tramway management has not only solved its own problem. It has pointed out the right and modern way of operating an electric railway transportation system in the interest of the public and to the advantage of the operator.

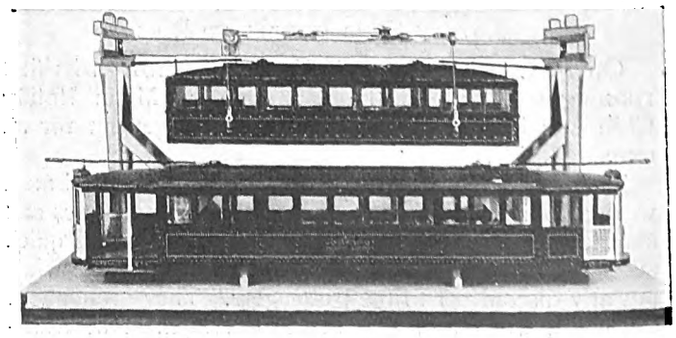
Signs Tell of Railway's Part in Street Work

SIGNS calling attention to the fact that 47 per cent of the total cost of the track and paving reconstruction is borne by the electric railway were displayed by the International Railway, Buffalo, N. Y., to inform the public of its part in the street rebuilding program. The buckboard sign shown in the accompanying illustration is one of many similar signs prominently displayed along Seneca Street during its reconstruction last year. Most of the signs were placed at highway intersections used by motorists coming to Buffalo from the western part of New York State and Pennsylvania.

Removable Double-Deck Car Suggested Traffic Aid

GETTING sufficient cars to handle rush-hour traffic in available space on San Francisco streets is a problem that has led A. W. Brohman, superintendent of transportation of the Market Street Railway, to design the double-deck car shown in model form in the accompanying illustrations. A feature of Mr. Brohman's idea is a removable upper deck for use only during rush hours. A traveling crane at carhouses would be used to place the upper deck on the main car body or remove it. The idea includes locking the upper deck automatically to the main car body and also making electrical connections and opening and closing doors at the head of stairways automatically as the upper deck is lowered into place or removed. The car would have an over-all length of 50 ft. and an over-all height of 16 ft. Seating capacity of the main car would be 44 and of the upper deck 40, making a total of 84. Total weight is estimated at 45,000 lb., of which the upper deck would weigh 8,000 lb. Spacious one-step platforms would avoid loading congestion and enable passengers readily to enter the top deck by a stairway from the rear platform and to leave by a front stairway. Patents have been applied for by Mr. Brohman on some of these features.





Model of double-deck car seating 84 passengers proposed by A. W. Brohman of Market Street Railway

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Bus Terminal Offers Many Conveniences

Mitten Tours terminal, located in the heart of Philadelphia, shares quarters with bank. Buses for New York, Atlantic City and Western points stop at the terminal

TRAVELERS arriving at the bus terminal of the Mitten Tours find themselves in the heart of Philadelphia, convenient to hotels, theaters, office buildings and the shopping center, the terminal occupying the ground floor of the Mitten Building, at Broad and Locust Streets. In addition to the advantage of the location, this terminal offers many conveniences. All night long the lights welcome the arriving traveler, and the day and night bank, situated on the same floor, cashes or sells travelers' checks, or serves its clientele in other ways.

The terminal may be entered from two sides. The Broad Street entrance faces a wide stairway leading to the mezzanine floor, which is occupied by the Mitten Bank departments for women and for workers' loans. The general banking services are on the first floor. At the rear of the waiting room are the ticket and information office and the corridor leading to the elevators. American walnut has been used in all woodwork, seats and desks in the quarters.

It has been found desirable to place bus terminals in the best locations the various cities served can afford. The bus has the advantage of being welcome anywhere and the company is capitalizing this advantage. At the Philadelphia terminal passengers find themselves near everything they could possibly need.

If the arriving traveler has only a few minutes to stay, the terminal building itself offers rest, information, money arrangements, telephone service and parcel checking. An information agency has been developed that is helpful to the traveler. Itineraries are planned for the pleasure-touring vacationist on the Mitten and connecting lines, with estimated cost and times of arrival and departure. This class of passenger traffic is found to increase yearly. Another convenience of this terminal is the lost and found department which adjoins the waiting room. This department also handles articles found on the local buses, the street cars and the taxicabs which are under the same management.

Interior view of the Mitten Tours ticket and information office

Every 1½ hours between 6:30 a.m. and 6:30 p.m. a bus leaves for New York, and one arrives every 1½ hours between 11 a.m. and 11 p.m. On the spring and summer schedules, a bus leaves for New York at 12:15 a.m. and one leaves New York for Philadelphia at the same hour. Every two hours between 7 in the morning and 7 in the evening a bus leaves for Atlantic City, and every two hours between 10:30 a.m. and 8:30 p.m. a bus arrives from there, with a late bus arriving at 11:30 p.m.

These schedules are adequate only for the working days of the week. On week-ends the service is augmented to meet the demands from every half hour to every ten minutes. On Easter Sunday of this year the company sent a bus away from the terminal for Atlantic City every ten minutes from early morning until mid-afternoon. Additional buses are used also on Saturday and Sunday over the New York route.

This current of travel deposits a great many transients at the terminal. The New Yorker wanting to go to Atlantic City by way of Philadelphia can make his stay cover the hour from 12 to 1 or from 6 to 7. Connecting with the Washington or Baltimore buses, the traveler from New York can enjoy stopover periods of three hours or less.

To the doors of the Philadelphia terminal come the buses of the Greyhound lines, which are direct connections with the Middle West, Southwest and Great Lakes

Banking quarters are situated on the same floor as the bus terminal, convenient for travelers

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Bus unloading at the Philadelphia terminal. After unloading the buses are kept in garages until needed for another run

region, and this makes Philadelphia an important point in long-distance travel. From this terminal point many transportation lines radiate to other Eastern cities, and a general transfer takes place here. Passengers from the West, many of them from the Pacific Coast, may change for New York and Boston, or Atlantic City, Baltimore and Washington.

Line Breakers Regularly Tested in Kansas City

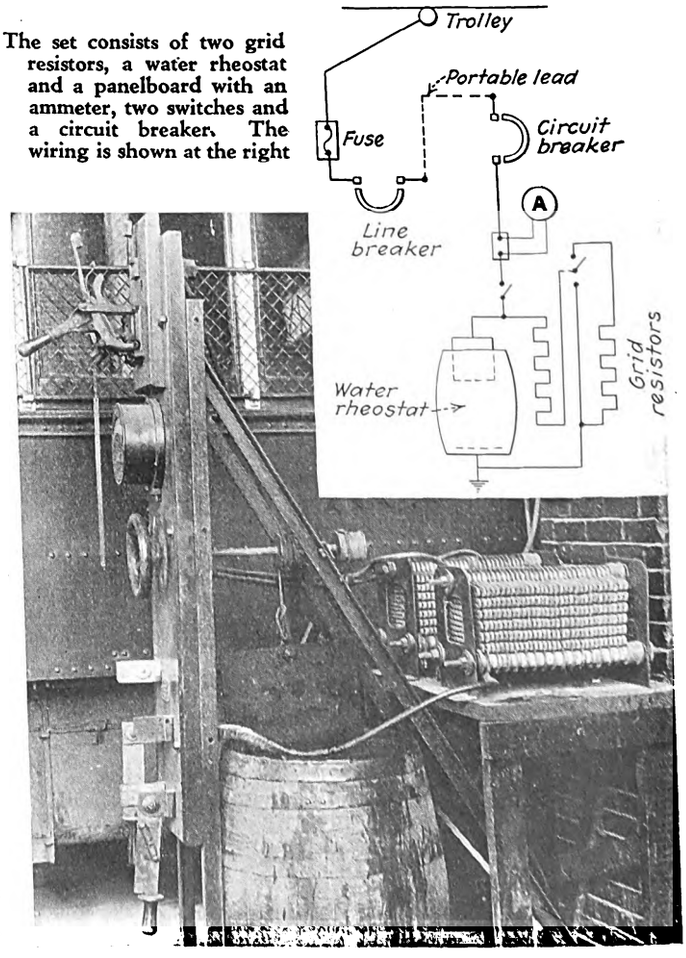
By J. W. Weir
Assistant to General Superintendent of Maintenance
Kansas City Public Service Company, Kansas City, Mo.

EQUIPMENT has been devised and installed in all of the carhouses of the Kansas City Public Service Company for testing the line breakers on the company's modernized street cars. Twice each year, during February and August, all the breakers on the system are checked and, where necessary, recalibrated. This is done to find defective breakers, particularly those with high or low settings. Incorrect settings are somewhat hazardous and usually result in traffic tie-ups. In addition to routine testing, checks are made of line breakers reported by trainmen as being unsatisfactory.

The equipment used for the tests consists of a line breaker, ammeter and two switches, all mounted on a panel, and two grid resistors and a water rheostat. To conduct a test the trolley lead of the car is removed at the controller and connected to a portable lead from the testing set. The controller handle is then advanced, admitting current to the holding coil and causing the line breaker to close. With the breaker closed, a circuit is completed through the main fuse, the line breaker itself and the testing set.

By means of a single-pole, double-throw switch one grid resistor or two in series can be placed in parallel with the water rheostat. With this switch closed a second one between the line breaker and the joint resistance is closed. The current then is increased by lowering the free plate of the rheostat into the solution. The plate is raised or lowered by a cord which is wound on a small drum, the drum being turned by a wheel on the front of the panel. The capacity of the rheostat is changed by varying the strength of the salt solution.

As the current increases its value is observed on an ammeter and the value at which the breaker trips is recorded. Predetermined current values at which the breakers should trip are charted on a graph located near the set.



The set consists of two grid resistors, a water rheostat and a panelboard with an ammeter, two switches and a circuit breaker. The wiring is shown at the right

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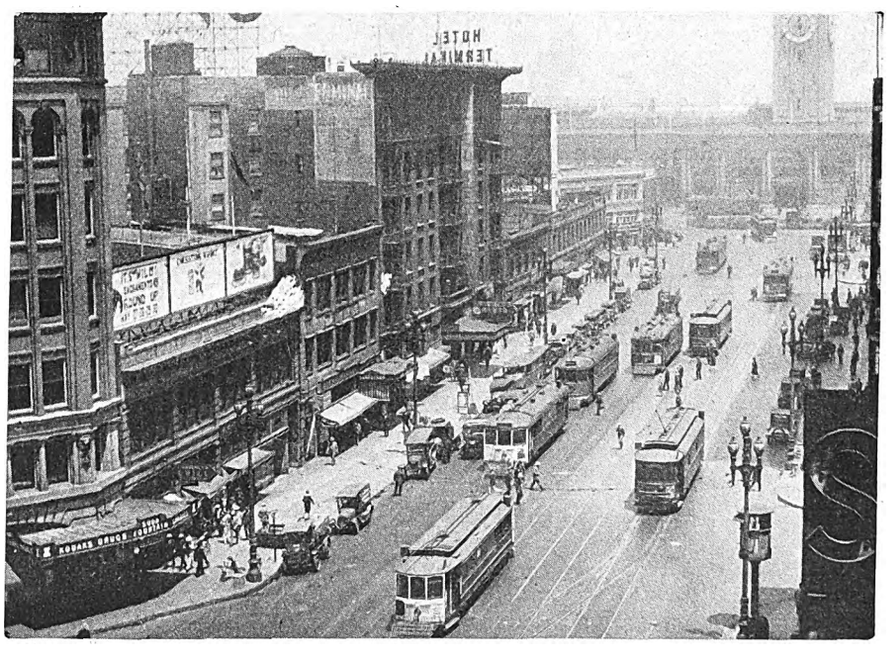
San Francisco Needs

Street Traffic Control

Concluding portion of McClintock report points to need of pedestrian control, restricted automobile parking in business district and installation of traffic signals. A complete traffic ordinance is proposed

SECOND ARTICLE



"Jay walking" is practiced even on Market Street, with its four lines of cars

IN THE issue of ELECTRIC RAILWAY JOURNAL for June 30 a summary was given of the first portion of a traffic report in San Francisco, prepared by Dr. Miller McClintock, director of the Albert Russel Erskine Bureau for Street Traffic Research of Harvard University. The recommendations made in the report were outlined in the first article and the characteristics of traffic flow and the electric railway situation treated. The report also gives a great deal of attention to pedestrian movement and the question of street congestion caused by automobile traffic and parking. These are treated in the following paragraphs.

OBSTRUCTIONS HINDER PEDESTRIAN TRAVEL

San Francisco is fortunate in possessing unusually wide sidewalks. Even so, the high concentration of traffic in certain parts of the central district during the peak hours of the day results in uncomfortable crowding. An intensive check of pedestrian movement at various intersections during a typical eight-hour business day revealed that there are more than 1,000,000 pedestrian movements to downtown intersections each day. In comparing the pedestrian flow studies made by the survey with those made at various periods in the past by the San Francisco Building Owners' and Managers' Association, the discovery was made that during the past three years there has been a substantial reduction in volume.

The survey staff also conducted all-day studies of pedestrian movements in the shopping and financial districts to determine the relation between the speed with which walkers could move and the density of sidewalk traffic. These studies proved conclusively that as the crowd increases, the speed decreases. This means a greater length of time for movement between shops.

The city has been careless in the protection of sidewalks against unnecessary obstructions, both private and public. A comprehensive study of the central business district revealed a great many obstructions, but those most numerous were trolley and light poles, fire plugs, open elevator covers, news stands, trash boxes and parking signs. The obstructions which occupied the greatest per cent of the sidewalk width were open elevator covers, flower stands, merchandise, bicycle stands and signs.

By far the great majority of fatal traffic accidents in San Francisco are the result of collisions between motor cars and pedestrians in the roadways. The responsibility of both motorist and pedestrian is mutual. This condition is due largely to a lack of definite standards of

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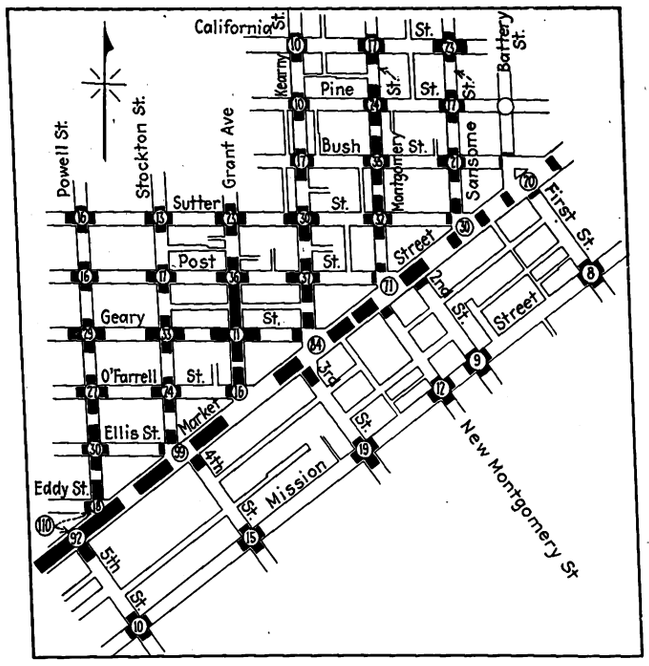

Pedestrians entering intersections in central business district of San Francisco on a typical week day of eight hours in October, 1926. The numbers indicate thousands of persons

rights and responsibilities of walkers and drivers in the public streets.

As a substitute for the present common law rule which provides that the rights of pedestrians and drivers shall be exercised at all places on the highway in accordance with equal and mutual rights, the report recommends that in certain portions of roadways pedestrians be given absolute and exclusive right of way over motor vehicles, and that at other places motor cars be given a qualified right of way over pedestrians. Pedestrian right of way is desirable where crossing of roadways is normally most frequent; that is, at or near street intersections. Between intersections drivers of vehicles should be given the qualified right of way over pedestrians.

In order that pedestrians at intersections may be given definite knowledge as to the precise places where they may cross, a system of marked cross-walks is proposed. The metallic cross-walk markers which are at present in general use are believed adequate for the greater number of intersections. A more visible marking, however, is required in certain places. Under certain conditions the volume of pedestrian and vehicular traffic is so great and the area of control so large that it is impossible to bring about suitable adjustment by means of regulations. Under these circumstances it is recommended that physical construction be resorted to which will make possible

Abstract of Proposed Ordinance Regulating

BE IT ORDAINED by the people of the city and county of San Francisco as follows:

Article I—Definitions

Section 1. (This section gives the definitions for the following terms: street, roadway, alley, sidewalk, intersection, crosswalk, safety zone, loading zone, vehicle, street car, pedestrian, operator, traffic, central traffic district, business district, right-of-way, park and official warning and direction signs).

Article II—Authority of Police, Traffic Signs and Signals

Section 2. *Obedience to police.* Officers of the police department are hereby authorized to direct all traffic by means of visible or audible signals, and it shall be unlawful for any person to refuse or fail to comply with any lawful order, signal or direction of a traffic or police officer.

Section 3. *Signs.* The board of supervisors shall by resolution determine and designate the character of all official warning and direction signs and signals. All signs authorized hereunder for a particular purpose shall be uniform.

Section 4. *Obedience to traffic signs.* It shall be unlawful for any operator or pedestrian to disobey the instructions of any mechanical or electrical traffic signal, traffic sign, or marks upon the street placed in accordance with the provisions of this ordinance. No public utility or department in the city shall erect or place any barrier or sign unless of a type first approved by the Board of Public Works.

Section 5. *Traffic stop and go signal legend.* Stop and go mechanical or electrical signals must use the colors, red, green and amber to indicate stop, go and prepare for a change, respectively.

Section 6. *The Board of Public Works is required to establish cross-walks.*

Section 7. *Display of unauthorized signs prohibited.*

Section 8. *Emergency vehicles are exempt from certain rules.*

Article III—Pedestrians

Section 9. *Pedestrian's right of way at intersection.*

(a) It shall be unlawful for the operator of any vehicle to drive into any cross-walk while any pedestrian is engaged in crossing the roadway.

(b) The foregoing provisions of this section shall not apply at intersections where traffic is being directed by an officer or a traffic stop and go signal, at which intersections the rights of pedestrians and operators of vehicles shall be exercised under the direction of the officer or traffic signals.

Section 10. *Pedestrian's limited right to use of roadway.* When within the central traffic district or a business district, no pedestrian shall cross a roadway other than by a cross-walk.

Section 11. *Pedestrians to obey signals.* At intersections where traffic is directed by a traffic or police officer or by a traffic stop and go signal, it shall be unlawful for any pedestrian to cross the roadway other than with released traffic.

Section 12. *Pedestrians standing on sidewalks.* In the central traffic district or in any business district it shall be unlawful for any pedestrian to stand on the sidewalk except as near as is practical to the building line or the curb line.

Article IV—Rules for Driving

Section 13. *Method of approach for left turn.* The operator of a vehicle intending to turn to the left at an intersection or into an alley or driveway shall approach the point of turning in the line of traffic next to the center of the roadway.

Section 14. *Method of turning to left at intersections.* Operator shall pass to the right of the center of the intersection before turning.

Section 15. *Location of turning markers.* (Locations for markers specified.)

Section 16. *Left turns prohibited at certain intersections.*

Section 17. *Method of approach for right turn.* The operator of a vehicle intending to turn to the right at an intersection or into an alley or driveway shall approach the point of turning in the line of traffic nearest the right-hand edge or curb of the street.

Section 18. *When right turns may be made.* In the central traffic district right turns may be made only on "Go" signal.

Section 19. *Turning around at intersections prohibited.*

Section 20. *Driving from alleys.* The operator of a vehicle emerging from an alley shall stop immediately prior to driving onto a sidewalk.

Section 21. *Vehicles shall not be driven on sidewalks nor in safety zones.*

Section 22. *Traffic lanes.* The Board of Public Works is hereby authorized to mark traffic lanes upon the roadway where a regular alignment of traffic is necessary.

Section 23. *Certain vehicles prohibited in central traffic district.*

Section 24. *Arterial streets.* (Twenty-four streets or parts of streets were declared to constitute arterial streets.)

Section 25. *Restricted traffic streets.* (Parts of five streets were designated as restricted traffic streets.)

Section 26. *One-way streets.* (Fourteen streets and parts of streets were designated as one-way.)

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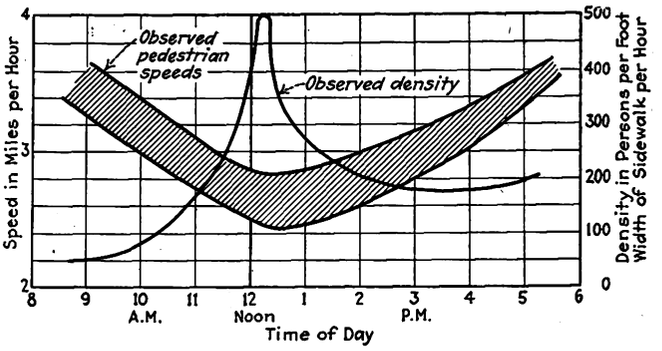
a separation of the conflicting types of traffic. Further consideration of the development of safety zones for the use of street car patrons is held to be essential. Operating conditions of the street cars make it necessary for persons to stand in the roadway, in places that are dangerous unless there is a definite rule protecting them from vehicular interference. It is important both from the standpoint of greater protection to pedestrians, as well as to the driving public, that button safety zones be marked in the most visible manner. Atmospheric conditions in San Francisco require that special precaution be taken. To this end several recommendations are made in the report for marking the safety zones.



Observed pedestrian speeds and density between Geary and Post Streets on a typical week day in March, 1927

Automobile Storage a Severe Problem

Storage of automobiles in San Francisco, the report says, presents a severe problem. There is an extreme lack of curb parking space and many users of automobiles are dissatisfied with the present 40-minute parking ordinance. To indicate the present parking practices, the survey made intensive studies of the entire central business district and also of a typical outlying business district. In the central district study, which covered 112 blocks, it was discovered that 59 minutes is the average parking time, notwithstanding the 40-minute rule. Of the 18,958 cars which were checked, 791 parked more than three hours, 88 parked more than eight hours and 14 more than ten hours. Altogether, approximately 36 per cent of the cars were parked in violation of the law. In the typical outlying business district, where the study covered six blocks, 803 cars were parked during the interval of the study. Forty-six minutes was found to be the average parking time for the typical vehicle, though fourteen parked longer than three hours, three more than six hours and one longer than nine hours.

Difficulty in enforcement of parking ordinances arises from two principal sources. In the first place it is difficult

Traffic Upon the Streets of San Francisco

Article V—Stopping, Standing and Parking

Section 35. *Stopping prohibited in specified places.* It shall be unlawful for the operator of a vehicle to stop such vehicle in any of the following places except when necessary to avoid conflict with other traffic or in compliance with the direction of a police officer or traffic sign or signal: in an intersection, in a crosswalk, between a safety zone and the adjacent curb within 20 ft. of a point on the curb immediately opposite the end of a safety zone, within 20 ft. of an intersecting roadway, and within 20 ft. of an entrance to any fire station.

Section 36. *Standing for loading only in certain places.*

Section 37. *Parking prohibited on certain streets.*

Section 38. *Parking time limited in the central traffic district.* The operator of a vehicle shall not park such vehicle longer than 40 minutes within the central traffic district between the hours of 7 a.m. and 6. p.m. of any day, except Sundays or legal holidays, and subject to the special restrictions imposed by Sections 35, 36 and 37.

Section 39. *Parking time limited in business districts.* The operator of a vehicle shall not park such vehicle for longer than 60 minutes within any business district between the hours of 7 a.m. and 6 p.m. of any day, except Sundays or legal holidays, and subject to the special restrictions imposed by Sections 35 and 36.

Section 40. *Early morning parking limited.* It shall be unlawful for the operator of any vehicle to park said vehicle on any street for a period of time longer than one hour between the hours of 3 a.m. and 5 a.m. of any day.

Section 41. *Standing or parking close to curb.* The operator of a vehicle shall not stand or park such vehicle in a roadway other than parallel with the curb and with the two right hand wheels of the vehicle within one foot of the regularly established curb line, except upon those streets which have been marked for angle parking.

Section 42. *Parking on grades regulated.*

Article VI—Street Cars

Section 44. *Rules applicable to vehicles passing street cars.* The driver of a vehicle overtaking any railway, interurban or street car, stopped or about to stop, shall bring such vehicle to a full stop at least 10 ft. in the rear of such street car and remain stationary until passengers of the car have boarded such car or reached a place of safety, except that where a safety zone has been established, or at an intersection where traffic is controlled by an officer or a traffic stop and go signal, a vehicle need not be brought to a full stop before passing any such car, but may proceed past at a reasonable speed.

Section 45. *Driving on street car tracks, passing safety zones.* It shall be unlawful for the operator of any vehicle proceeding upon any street car tracks in front of a street car to fail to remove said vehicle from tracks as soon as practicable after signal from the operator of street car. On Market Street from the Embarcadero to Van Ness Avenue, it shall be unlawful to drive any vehicle to the left of any safety zone established at a regular street car stop. It shall be unlawful to drive any vehicle to the left of any safety zone established in the city if the roadway to the right of said safety zone is immediately available for travel.

Section 46. *Street car speed.* The operator of a street car upon a street shall operate the same at a careful and prudent speed and subject to limitations, may lawfully proceed at a speed not exceeding 15 m.p.h. in a business district, 20 m.p.h. in a residence district, or 40 m.p.h. under other conditions.

Section 47. *Boarding or alighting from street cars or vehicles.* It shall be unlawful to board or alight from a street car or vehicle in motion.

Article VII—Penalties

Section 48. *Penalty.* The penalty for the violation of any provision of the ordinance is $50 fine or 5-days imprisonment or both for the first offense, $100 fine or 10 days imprisonment or both for the second offense and $300 fine or 30 days imprisonment for the third and each additional offense, if committed within a year of the date of the first offense.

Section 49. *Disposition of fines and forfeitures.* All fines or forfeitures collected upon conviction or upon the forfeiture of bail of any person charged with a violation of any of the provisions of this ordinance shall be paid into the city treasury and deposited in a special fund, which is hereby created, to be known as the "Street Traffic Fund." There may be appropriated out of said fund such moneys as from time to time may be authorized by the Board of Supervisors for the purchase and maintenance of official traffic signs, signals, lights, and paint marks necessary to designate the provisions of this ordinance, and the balance of said fund shall be used exclusively in the construction, maintenance and improvement of public streets within this city.

Section 50. *Effect of ordinance.* If any portion of this ordinance is for any reason held to be unconstitutional, such decision shall not affect the remaining portions.

Section 51. *Repeal.* All ordinances in conflict are hereby repealed.

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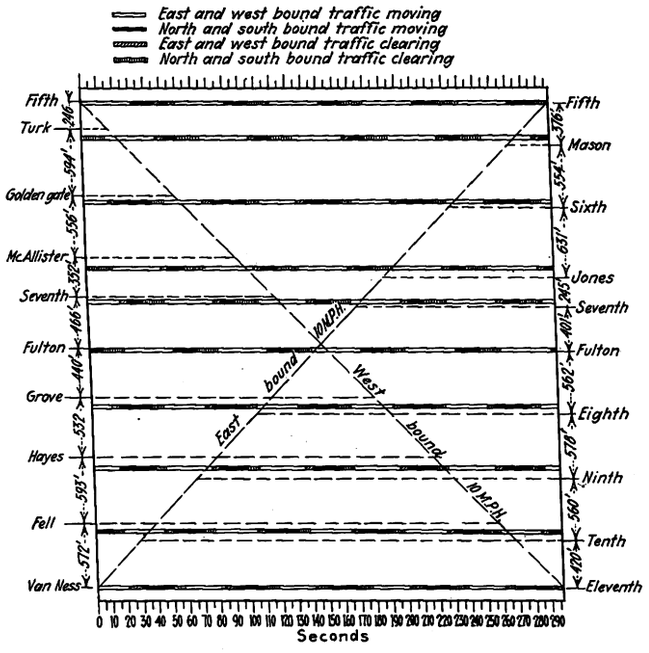


Proposed progressive timing of traffic signals on Market Street, from Fifth Street to Van Ness Avenue, based on speed of 10 m.p.h.

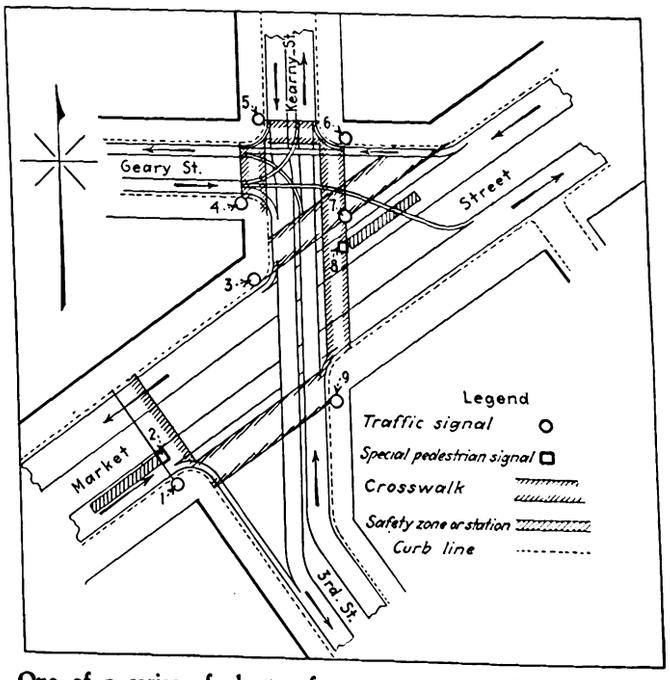
to get sufficient police personnel assigned to the task of checking parked cars. Secondly, for conviction, it is practically necessary for the police to obtain personal service upon the violator. Of the total of 18,958 cars which were studied, only 6,798 were found to be violators of the 40-minute rule, and of these, 2,298 were only mild violators, parking for from 40 minutes to one hour. The central district was monopolized by a comparatively few long-time violators. It is concluded, therefore, that the 40-minute rule as it now applies to the central district is sufficiently exact to warrant a continuation. For outlying business districts the report recommends that the parking limit be one hour, which is also a continuation of the present practice.

Each normal business day, 8 a.m. to 6 p.m., finds approximately 81,000 vehicles entering the central business district. The question as to the capacity of this district to store these vehicles while the drivers are transacting business is one of the very greatest importance, both from a standpoint of reasonable facility of traffic movement and from the standpoint of good business. The curbs of the central district in San Francisco into which the 81,000 vehicles come daily have a total length between property lines of 47,934 ft. On the assumption of 18 linear feet per car, these curbs are physically capable of accommodating at one time 2,663 cars. This figure is reduced to 2,010 cars by legal parking restrictions. With a strict obedience to the 40-minute rule, the legally available curb area would accommodate in a ten-hour day, from 8 a.m. to 6 p.m., 30,150 motor cars. With present practice, an average of 59 minutes parking time, these curbs can accommodate only 20,450 automobiles. Even with a strict observance of the 40-minute rule only 37 per cent of the automobiles entering the district could be accommodated. This pressure for parking is further indicated by the almost complete utilization of the available space at the present time. From early in the business day until approximately 5 o'clock in the afternoon, almost every legally available space is filled, which means that late-comers find it difficult to obtain a stopping place.

San Francisco shows the double line parking evil to a greater extent than practically any other city in the United States. In one single block as many as nineteen vehicles have been checked standing in double line, a large number of them trucks. A comprehensive check of the central business district, equivalent to an instantaneous view of the entire area, showed 77 automobiles standing in double line, of which 32 were passenger cars and 45 trucks.

Modes of Transportation of Retail Customers Studied

To determine the relation between motor car traffic and more especially between the curb parking of motor cars and retail business, an all-day study of the modes



One of a series of charts of recommended traffic control and vehicular traffic flow for a typical week day (eight hours) in November, 1926. This chart is for the intersection of Third, Geary, and Market Streets

and habits of transportation of customers was conducted. During the one-day study, 32,000 customers cast ballots indicating the means of transportation used by them on that day. Of the total of 32,312 patrons arriving at the stores, 60.2 per cent arrived in street cars, 21.8 per cent walked and 18 per cent came in automobiles. The figure of 18 per cent using automobiles is comparatively high, the report says, because a

TABLE SHOWING PATRONS ARRIVING BY VARIOUS MEANS OF TRANSPORTATION, BASED ON ONE DAY'S STUDY

	Department Stores		All Other Stores		Office Buildings		Banks		Restaurants		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Walking	4,201	19.3	966	23.3	624	28.5	567	24.3	691	36.7	7,053	21.8
Riding on street cars	13,755	63.2	2,322	56.1	1,094	49.6	1,391	59.7	877	46.5	19,439	60.2
Arriving in automobiles, total	*3,797*	*17.5*	*851*	*20.6*	*482*	*21.9*	*374*	*16.0*	*316*	*16.8*	*5,820*	*18.0*
Arriving, parked at curb	2,300	10.6	562	13.6	316	14.3	231	9.9	185	9.8	3,594	11.1
Arriving in garage, driven by chauffeur	1,497	6.9	289	7.0	166	7.6	143	6.1	131	7.0	2,226	6.9
Total of all patrons	21,753	100.0	4,139	100.0	2,204	100.0	2,332	100.0	1,884	100.0	32,312	100.0

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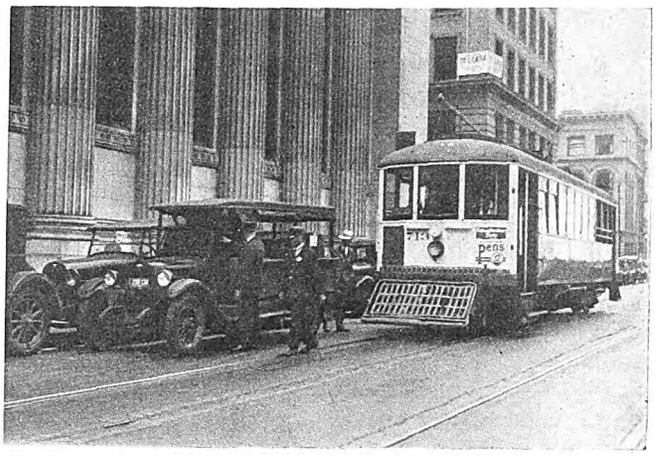
similar study conducted in Chicago shows that but 8 per cent of the patrons could be attributed to motor-car transport. Further, approximately one-half the motor car users, or 11 per cent of the total number of patrons interviewed, were able to park their motor cars at the curbs in the central district. In other words, curb parking still plays an important part in retail trade in San Francisco and severe restrictions on it should be proposed only with the greatest care. The survey has consequently recommended only such restrictions as are moderate and essential.

As to off-street storage of motor cars, the development of garage facilities in San Francisco is very encouraging. The storage garages within the district or closely adjacent to it have a capacity of 4,202 cars. In other words, the garage capacity already is more than 200 per cent of the curb space.

Temporary stopping of vehicles for loading and unloading merchandise is one of the essential factors in commercial traffic. The ease and speed with which this loading can be consummated is no small factor in the cost of commercial deliveries. San Francisco, unfortunately, is not well provided with alleyways making possible rear access to commercial houses. This necessitates an unusually large volume of merchandise transfer over sidewalks. This type of transfer is disadvantageous for the person making the delivery, and likewise to the public because of the interference which it offers to pedestrians.

Recommendations in the report, for parking control, include the prohibition of the stopping of cars at certain places except for the receipt and discharge of passengers or material, when the limit for passenger vehicles would be set at three minutes and of commercial vehicles at twenty minutes; the provision for loading zones wherever possible; continuing the 40-minute parking, and limiting parking in all business districts to one hour. Regarding the manner of parking, a provision is proposed which would permit parallel parking alone on the main street and angle parking only where indicated. To eliminate the undesirable practice of leaving cars upon the street all night a provision is suggested that parking for more than one hour between 3 a.m. and 5 a.m. be prohibited.

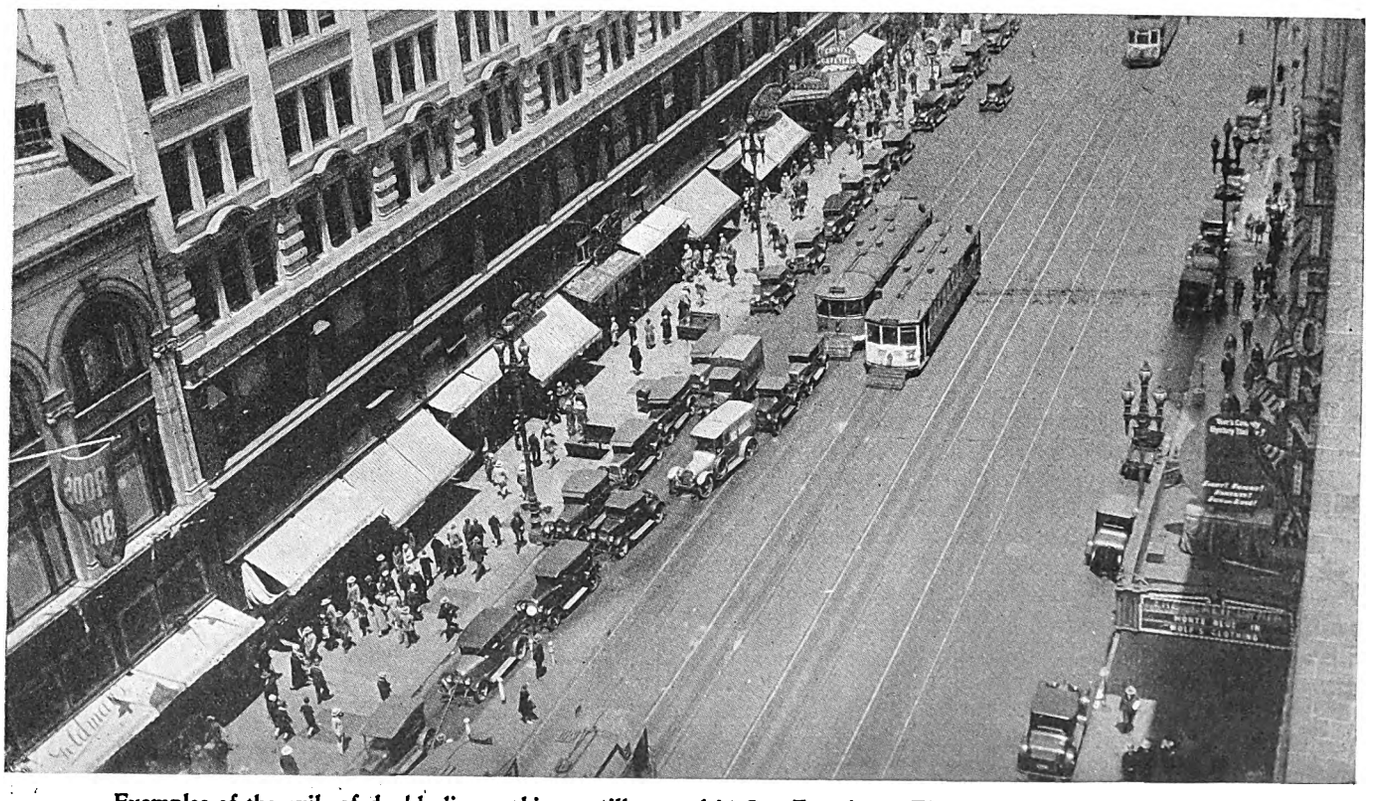


This view also shows the evils of double line parking in San Francisco

Signal Installation Program Recommended

All California cities are fortunate in having a uniform system of traffic warning and direction signs. These standard signs are so satisfactory that no general changes are recommended.

The present signal installation in San Francisco was started in 1922 and has been expanded to the point where it now covers twenty intersections in the central district, five along Van Ness Avenue and twelve elsewhere in the city. To assure a systematic signal policy for the city and maximum value from funds expended for



Examples of the evils of double line parking, as illustrated in San Francisco. Electric cars on the outside tracks of Market Street are being delayed from this cause

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this purpose, a definite program of installation is recommended. The program may be divided into four parts in the order of their importance: Market Street, the remainder of the central traffic district, Van Ness Avenue, and outlying installations.

Market Street Problem Unique

According to the report, it is probable that there is no traffic artery in any American city which possesses more than a fraction of the complexities to be found on Market Street. The street is a key artery, acting as the principal collector and distributor for the important traffic from the north, west and south. Its physical characteristics are of the utmost irregularity. Practically all of the intersections are of the five-point type, making standard and normal control methods impossible. Not only are the intersections along the north side of the street irregular in their design but in their relation to the arteries entering the street from the south. The width of the street—120 ft. between property lines and 80 ft. between curbs—and the character of traffic add further to the difficulties of control.

It is also unusual among larger city thoroughfares in congested districts in that it has for its entire length through the central district, four tracks carrying short headway traction traffic, with frequent turns into and off of the street. A final element of complication is to be found in the varying character and volume of vehicular traffic.

Notwithstanding the many physical difficulties of Market Street the survey developed a control plan for this key artery of traffic which, it is claimed, will vastly improve conditions without costly physical alterations. The peculiar characteristics of Market Street were the determining element in the type of signal recommended. The survey advises the adoption of a three-light electric signal device designed to meet the charted control as set forth in special plans of control designed for seventeen intersections along Market Street. The design for one of these intersections is shown in an accompanying illustration.

For the protection of pedestrian traffic it was necessary to design a series of cross-walks for the entire length of Market Street. These were placed at the points of greatest demand for pedestrian crossing, at locations where the routes to the opposite curbs are shortest and where visibility is highest. Furthermore, it was necessary to co-ordinate the cross-walk locations with the street car stops to facilitate the movement of traction traffic, and to provide complete freedom for pedestrians who are crossing the roadways.

Progressive timing is recommended for all of the central district installations. The detailed plan for Market Street contemplates a potential speed of between 8 and 10 m.p.h. for the entire distance between the ferries and Van Ness Avenue, with not more than one required stop for vehicular traffic in this distance, and with a minimum of signal delay to traction units. The progressive control provides practically non-stop movement in both directions. Detailed plans were designed also for progressive control on other typical streets in the central district, and for Van Ness Avenue.

For pedestrian regulation on Market Street special pedestrian signals in addition to the regular vehicular signals will be required. This requirement is due primarily to, first, the irregularity of the intersections and the necessary location of the cross-walks, which makes it impossible in many cases for pedestrians in crossing at their designated places to have in view the signals which are placed for the control of vehicular traffic, and, second, the width of the street, 80 ft. between curbs, which requires a clearance interval of not less than fourteen seconds for the protection of pedestrians. Obviously, no system of pedestrian signaling will be satisfactory on any street if pedestrians crossing with the "go" signal are to be left stranded in the middle of the street in the midst of heavy traffic. Therefore, the recommendation is made that special pedestrian signals be installed in accordance with the special plan indicated in the charts for seventeen intersections along Market Street.

Recommendations Listed

The more important recommendations of the traffic survey committee fall into five well-defined classes: (1) installation and use of various safety and regulatory devices; (2) enforcement of law through the police department; (3) punishment of violators; (4) administrative organization for a more systematic handling of future traffic problems; and (5) a specific and balanced system of traffic regulations.

The first four of these classes were summarized at the beginning of the article in the issue of June 30. The fifth, which is in the form of a completed traffic ordinance, is presented in brief form on pages 12 and 13. Because of its length, a few sections and parts of the text of other sections were omitted.

World's Biggest Passenger Station at Melbourne, Australia

WERE one asked to name the biggest passenger station in the world, some prominent terminal of New York, Chicago, London, Paris or Berlin would come to mind. It will therefore surprise many that, so far as known, the premier passenger plant of the world is the Flinders Street Station, Melbourne, Australia. The following Melbourne figures, as well as the accompanying illustrations, are due to the courtesy of W. O. Strangward, secretary Melbourne and Metropolitan Tramways Board:

FACTS ABOUT FLINDERS STREET STATION AND VICINITY

Daily number of passengers	283,000
Daily number of trains arriving and departing	2,400
Daily number of street cars crossing the intersection of Flinders and Swanston Streets	3,312
Number of cars crossing the same intersection between 5.15 and 6.15 p.m.	529

A comparison on a 340-day basis with the biggest stations of New York, (see New York Transit Commission figures for 1926 published in Electric Railway Journal, page 780, April 30, 1927), indicates that Flinders Street Station certainly "out-busies" anything in New York, at any rate.

ANNUAL PASSENGER TRAFFIC (340-DAY BASIS)

Flinders Street, Melbourne	96,220,000
Hudson & Manhattan Terminal, Cortlandt Street	70,649,035
Pennsylvania Station	54,908,953
Grand Central Station	43,662,056

Accompanying illustrations show not only the Flinders Street Station but also specimens of the Victorian State Railway's splendid dining and observation cars, as well as a car and bus of the Melbourne system.

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Maintenance Methods *and* Devices

Ignition Test Outfit*

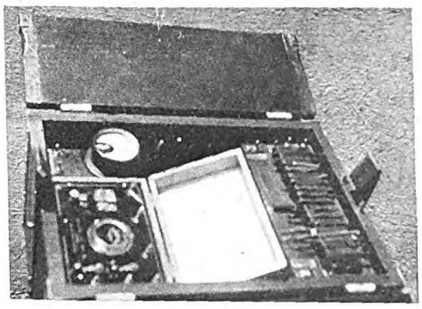
By Charles Herms
General Foreman San Diego Electric Railway, San Diego, Cal.

REPAIRING and adjusting the ignition equipment of buses by the men assigned to this work by the San Diego Electric Railway, San Diego, Cal., is facilitated by a test box with necessary instruments and a full line of tools. The accompanying diagram shows the connections for the equipment, and the halftone gives an idea of its arrangement in the box.

The $\frac{5}{16}$-in. spark gap gives a positive method for checking coils for defects. The condenser in the test set is used for comparing the condenser on a bus with a good one, to make certain that it is up to standard. Referring to the diagram, this is done by throwing switch *S*-2 to make contact with *B*. When thrown to *A* the test condenser is out of circuit. To operate the vibrator the switch *S*-1 is thrown to *C*. If an intermittent spark is desired switch *S*-1 is thrown to *D*. The knob of the switch must be pressed down each time to make contact, as with a telegraph key. An ammeter is used for checking the current in the primary winding of ignition coils, and the voltmeter is used principally for checking batteries. In making a voltage test the battery is given a load of at least 10 amp. for one minute previous to taking a reading.

A test bell which forms a part of the equipment is used for locating trouble. Test lamps are used on distributors with two breaker points, the object being to have both points make and break at exactly the same instant. In this test a piece of paper is inserted between one pair of contacts and the other is adjusted to 0.030 in., or not less than 0.025 in. The engine is cranked until the contact closes. One side of the lamp terminal is connected to the positive side of the battery and the other to the primary terminal on the distributor. Care is taken to disconnect the primary lead from the distributor. Then by turning the engine slightly either way the lamp will be lighted or extinguished. The point is found where it will just light, and then the paper is transferred to this contact. Without moving the engine the other contact is adjusted until it will just light the lamp. With a little experience accurate adjustments can be made quickly with the test outfit.

Submitted in Electric Railway Journal Prize Contest.



Equipment as arranged in test box

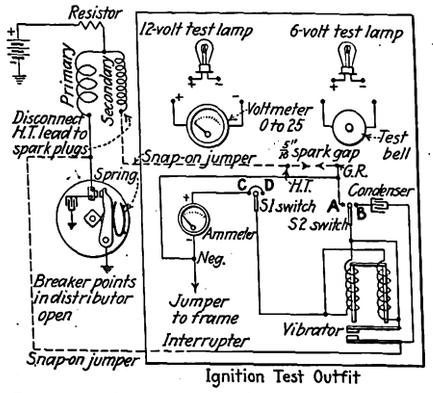


Diagram of connections for ignition test box

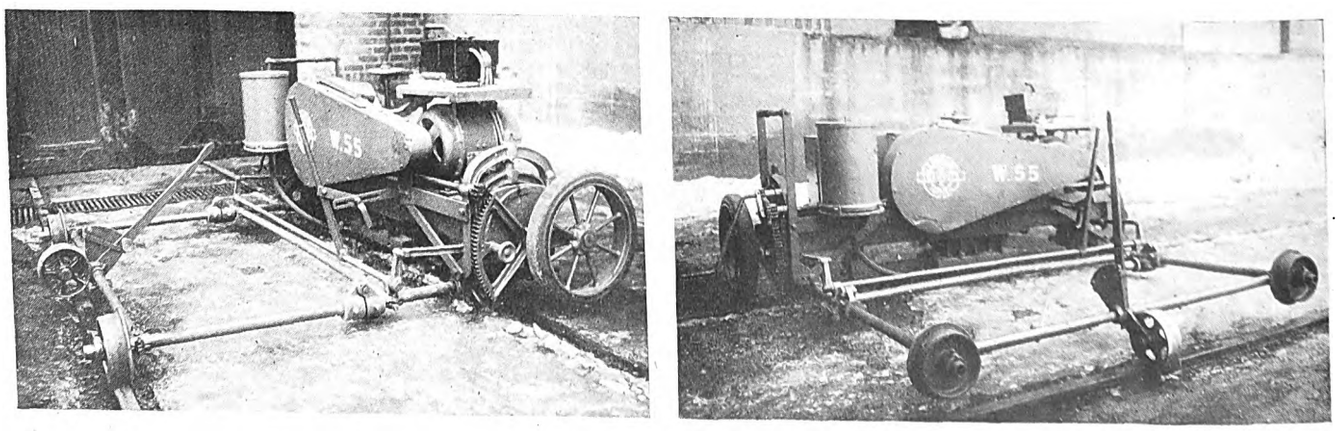
Lifting Device for Track Grinder*

By J. Mercier
General Foreman Track Service Division, Montreal Tramways, Montreal, Canada

USUALLY a track grinder is too heavy and unwieldy to be wheeled readily from the rails by one man. As one man can run the machine, it is a distinct advantage, particularly where headways are short, if he can roll the grinder off and on the track alone. A simple device was constructed by the track service division of the Montreal Tramways by which one man can lift and roll a Vulcan grinder rapidly from the track in half the time ordinarily taken by a crew of two men.

The device is shown in the accompanying illustrations. A star wheel of 8-in. diameter and $2\frac{3}{4}$ in. wide is mounted on a 1-in. axle. This is attached to the lower end of a lever 2 ft. 6 in. long, which is bent at an angle of 135 deg. at a point $5\frac{1}{2}$ in. from the lower end, a boss being

Submitted in Electric Railway Journal Prize Contest.



A lifting device that allows one man to run a track grinder

At left, the grinder is in normal position on the track; at right, the small wheel carries the weight so that the grinder may be rolled free of the rails

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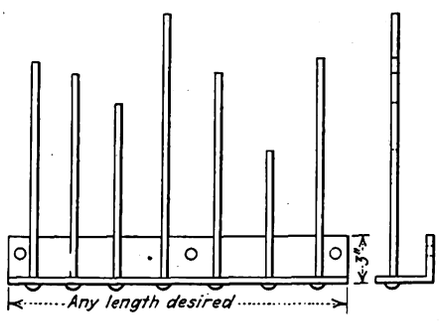
welded on at this point to revolve on the horizontal rod which connects the two flanged wheels of the grinder. On one side a collar held by a set screw keeps the lever in place, and on the other it presses against a sector plate also held to the horizontal rod. This sector plate has two holes placed 6 in. apart, and so located that a spring latch pin on the lever will drop into one or the other as the lever is turned about its fulcrum.

With the lever in the lower position the small wheel is free of the road surface and the flanged wheels roll on the rail, holding the machine in correct position for grinding. By lifting the latch pin out and pulling the lever upward the small wheel is lowered to the roadway and the flanged wheels are lifted clear of the rail. The pin drops into the upper hole in the sector plate to hold the lever in position so that one man can push the grinder clear of the track. When it is desired to put the grinder back on the rails the action is reversed.

Material Storage Rack Prevents Waste

LOSS of such small material as nuts, lock washers, bushings, flat washers, etc., has been prevented in the shop of the New York, Westchester & Boston Railroad, Westchester, N. Y., by the use of a rack for the storage of this small material. The rack consists of a piece of 3-in. angle to which a number of $\frac{1}{4}$-in. to $\frac{5}{8}$-in. round rods have been welded. This angle is bolted to the shop wall. The shop mechanics and sweepers were instructed to salvage all of this material found upon the floor and place it on these rods according to size. This material is consumed before any new material is withdrawn from the storeroom.

The saving in this material through the plan has been very noticeable.

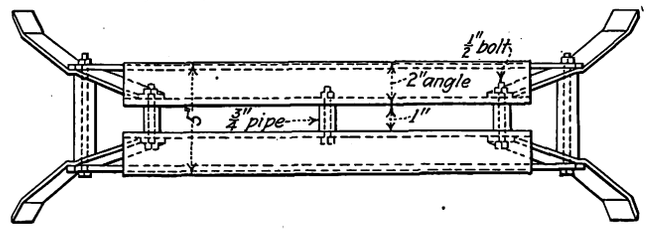


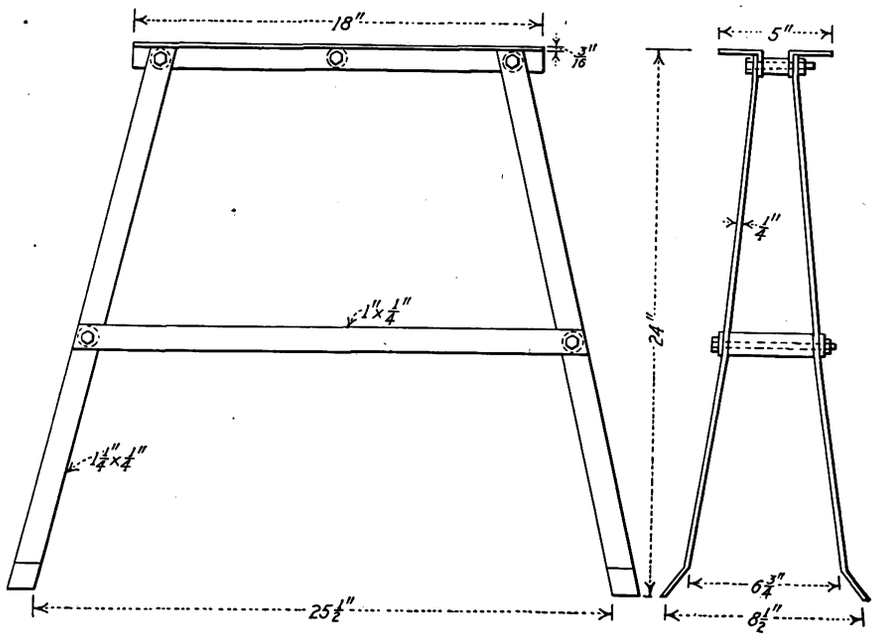
Rack for nuts, washers and small material

All Steel Portable Horse

REPAIRING of horses in the shop of the Richmond Railways, Inc., Staten Island, N. Y., was a large item in the annual expense of maintaining the shop equipment until all-steel horses of the type shown in the accompanying sketch were adopted. These were designed and manufactured in the shop. These horses are used in various departments and occupy a floor space of $8\frac{1}{2}$x$25\frac{1}{2}$ in. They are constructed of angles and bar steel, and the over-all height is 24 in. The top is made from two 2x$\frac{3}{16}$-in. angles bolted together and spaced 1 in. apart. Three pieces of $\frac{3}{4}$-in. pipe 1 in. long form the spacers. The legs are made of $\frac{1}{4}$x$1\frac{1}{4}$-in. flat steel and are bolted to either corner of these angles. The top of the horse is 18 in. long and 5 in. wide, and the over-all base dimension of the feet is $25\frac{1}{2}$x$8\frac{1}{2}$ in. The flare of the legs gives a firm footing and prevents over-balancing. The legs are reinforced by 1x$\frac{1}{4}$-in. flat steel on the front and a $\frac{1}{2}$-in. bolt passing through a $\frac{3}{4}$-in. pipe spacer on each end.

These horses have been found portable, strong and light to handle. The expense for maintenance has been negligible.

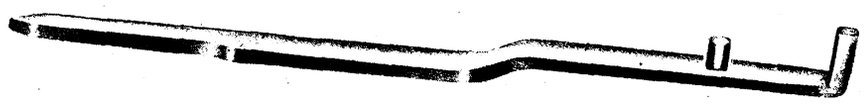




Strong steel horses used by Richmond Railways, Inc.

Brake-Adjusting Tool

MAKING an adjustment of the truck dead lever in the dead lever rack was a slow and tedious job in the shop of the New York & Queens County Railway, Long Island City, N. Y., so the tool illustrated was designed for this purpose. It consists of a flat offset bar 29 in. long, forged from $\frac{1}{2}$x$1\frac{1}{2}$-in. stock. A $\frac{3}{4}$-in. square pin 2 in. long is welded to the flat surface of the bar near one end. A $\frac{3}{4}$-in. round pin 1 in. long is also welded to the bar on the same surface. These pins are spaced at $3\frac{1}{4}$-in. centers.



Tool for adjusting truck dead lever

This tool is very simple to use. The round pin is inserted in a rack hole and the square pin is placed behind the dead lever. This provides a fulcrum and sufficient leverage to make any adjustment with a minimum of manual labor.

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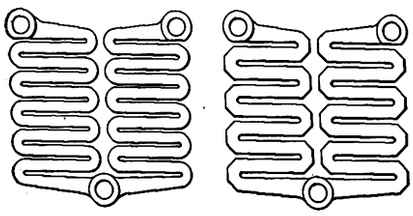
New Equipment Available

Change in 8-In. Resistor Grids

STANDARD 8-in. three-point suspension resistor grids of the Westinghouse Electric & Manufacturing Company have been redesigned to improve ventilation, reduce localized heating, increase mechanical strength and to facilitate manufacturing. The mechanical interchangeability of the grids is not affected, as they still come well within the outline dimensions of the end frame. The important clearances are therefore unchanged.



Changes in design of 8-in. resistor grids
At left, old style; at right, new style

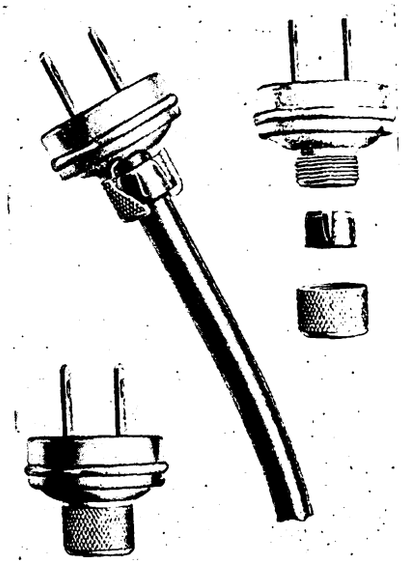
Electrically the improved grids are also interchangeable with previous ones, as the resistances of the various styles remain unchanged. In a few the continuous and intermittent current ratings have been increased. Each individual grid of the improved design is interchangeable with the one of the old design of the same style number.

Improved Grip for Attachment Plug

SHORT-CIRCUIT hazards are lessened, it is claimed, by an unbreakable attachment plug cap with an improved type of cord grip announced by the Cutler-Hammer Manufacturing Company, Milwaukee, Wis. The cord grip acts as a positive strain relief. Fastening of the cord grip is extremely simple and can be done without tools as it is necessary only to screw down the knurled collar.

The collar wedges a fiber bushing tightly against the cord. Parts are so designed that a natural pressure from the inside prevents loosening of the knurled collar and insures a firm grip. A fiber grip bushing serves to insulate the cord from metal parts and prevents damage to the cord. This bushing also acts as a clamp and is the only part that actually touches the cord.

The cap is the same as the unbreakable "Dreadnaught" line of caps made by the company. A rustproof armored shell made of heavy brass prevents breakage when dropped. Sheet bakelite is used to hold the blades firmly in place.



Cord grip plug cap

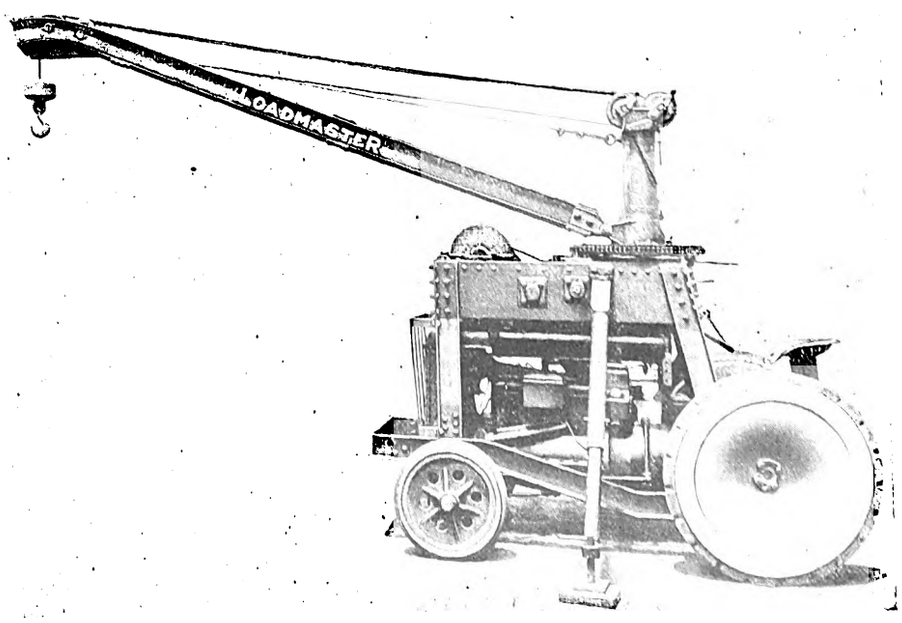
Small Swinging Crane

DESIGNED to meet the growing need for a small locomotive type crane in storage yards, repair shops, warehouses, machine shops and garages, the Loadmaster swing crane is offered by Frederick H. Poor, Inc., New York, N. Y. It is capable of easily handling loads which cannot be advantageously handled by manual labor, which are either too small to justify the installation of large crane units, or loads which, by reason of their location, are not within reach of ordinary hoist service.

To provide stability specially weighted wheels are employed at both rear and front to counterbalance loads in suspension from the boom; and broad tires upon these wheels sustain the loads without undue tire loading. The frame upon which the mast is located consists of a fabricated plate and channel structure secured at the rear to the axle-housing of the tractor, and is suspended at the front in such a way as to compensate for irregularities in the floor or roadbed over which the machine travels.

The hoisting drum is connected directly to a self-locking worm gear, and is operated from the power take-off, through a clutch and bevel pinions by a control lever within easy reach of the driver. When the drum is not in motion the self-locking worm gear holds the load in suspension on the boom without use of friction brake.

The swinging boom is constructed of two steel channels braced firmly together, and equipped with necessary sheaves and hook weight. The "bull wheel," by which the boom is swung about the mast, is power driven by means of chain and sprocket, and is equipped with an expanding brake of design such that the boom may be controlled in its swing, or, when not under power, may be set in any fixed position. Adjustable telescoping outriggers allowing heavier loads to be swung over the sides will be furnished at extra cost. These outriggers may be folded alongside the machine.



Swinging crane of the small locomotive type

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Association Activities

C.E.R.A. Takes Stock of Present and Future

IT WAS quite generally agreed among the 200 members of the Central Electric Railway Association attending the two-day convention held at Cedar Point, Ohio, June 28-29, that to classify the electric railway men of the Middle West simply as optimists or as pessimists was to deny the less fortunately situated of the transportation fraternity due recognition of their avowed determination to bring their properties through the difficult period of declining revenues to more prosperous times.

Two exceptional analyses of the trend in railway business were provided in papers by Charles W. Chase, president Gary Railways, Gary, Ind., and by Harold V. Bozell, Bonbright & Company, New York City. The conclusions reached by Mr. Chase in his discussion of the future for interurban and city railway lines so closely checked with those expressed by Mr. Bozell in his observations of the industry from outside its ranks as to gain added significance from their joint agreement.

Both speakers expressed the opinion that there prevailed a feeling that as a business the electric railway industry has been in much worse throes than it is now; that while considerable remains to be done in securing more traffic, the industry is apparently on the upgrade once more. Electric railways, both men agreed, have been the victims of such factors as the psychology of the fixed 5-cent fare, the load of burdensome and misplaced taxation, the enormous increase in paved streets, the unanticipated increase in the number of automobiles, and in some localities, still, unrestricted competition from buses.

The conclusion is forced, said Mr. Chase, that for an indefinite period the electric railways must look for only a moderate increase in revenue; that the principal hope of betterment lies in devising ways and means of reducing expenditures where such can be done without impairment of necessary and justifiable service. That traffic now using automobiles and motor transportation can be induced to return again to the electric railways has been shown by the successful rejuvenation of some of the electric lines in the Middle West territory.

One very definite thought which occurs to many people analyzing the railway industry today, according to Mr. Bozell, is that the principal competitor of the electric railway is the private automobile. In considering the probable extent of the increased use of highways for shipment of both passengers and freight by commercial carriers it is well to bear in mind, said Mr. Bozell, that the system of hard roads which is being rapidly extended throughout the country was made possible by the demands of the private car owners. Just how far these roads may be pre-empted for commercial hauling without producing a popular reaction and consequent restriction of their use, must not be overlooked in considering the relation between railway and highway transportation of the future.

President W. S. Rodger, general traffic manager Detroit United Lines, in his address opening the Thursday morning session, urged the need for smooth roadways and comfortable cars comparable with the best vehicles supplied by competitive lines of transportation. Continuing, Mr. Rodger said that while it is true revenues in some territories show a decline, it is no more than is reflected in the general business of the company by the drop in steam road revenues and car loading figures. Changing conditions will cause setbacks here and there at times, but everything tends to show that under properly regulated competition the electric railway has a field of its own which is certain to prevail where satisfactory service is rendered. Unreasonable competition can only be kept at a minimum or eliminated by maintaining proper relations with the various communities, the governing bodies, the public, and the newspapers.

Thursday's session was enlivened by an unusually spirited discussion of the problems confronting the industry. Those contributing to the discussion included F. D. Carpenter, president Western Ohio Railway & Power Corporation; H. A. Nicholl, general manager Union Traction Company of Indiana; J. F. Collins, general manager Michigan United Lines; J. M. Pogue, general manager Indiana, Columbus & Eastern Traction Company; George R. Green, general superintendent Chicago, South Bend & Northern Indiana Railway; W. H. Sawyer, president Stevens & Wood, New York City; Charles Gordon, editor ELECTRIC RAILWAY JOURNAL; H. A. Cowgill, manager Ohio Public Service Company; R. N. Graham, manager of railways Penn-Ohio Electric Company; C. L. Van Auken, managing editor *Electric Traction;* Charles H. Jones, general manager Chicago, South Shore & South Bend Railroad, and F. H. Wilson, vice-president and general manager Cleveland Southwestern Railway & Light Company.

Clinton D. Smith, superintendent of personnel Cleveland Railway, in his paper on employee welfare emphasized that industrial relations work is prompted by a recognition that the employee, particularly the trainman, is the "key man" in establishing and maintaining a sales contact with the public. We have observed, said Mr. Smith, that the sale of the automobile, the radio, telephone service, and other commodities and services have been in some ratio to the quality of salesmanship exerted. Patronage is not an item of chance. The present traffic does not consist merely of those who have to ride. A definite ratio exists between the amount of traffic and the type of car, coach, condition of roadbed, schedule speed and personal service. However, the greatest attainment with any or all of these factors favorably disposed will be disappointing if we slight the development of the salesman, if we fail to establish a sales division in our railway organizations for the purpose of giving specific sales instruction to our trainmen. Throughout his paper Mr. Smith laid especial emphasis on the idea of specific sales training, asserting that a general welfare or personnel routine pursued with an indefinite program will not produce salesmen. He granted that it is impossible properly to organize a sales division without special consideration to employment and welfare, as well as accident prevention. The latter

COMING MEETINGS OF *Electric Railway and Allied Associations*

***July 8-12*—Public Utilities Advertising Association and International Advertising Exposition. Detroit, Mich.**

***July 12*—New York Railroad Club, annual outing, Indian Point, N. Y.**

***July 13*—A.E.R.A. Executive Committee on yacht "Florida," New York, N. Y.**

***July 17-20*—American Society of Civil Engineers, annual convention, Buffalo, N. Y.**

***July 19-21*—Pacific Claim Agents' Association, annual convention, San Diego, Cal.**

***July 25-27*—Electric Railway Association of Equipment Men, Southern Properties. Cincinnati, Ohio.**

***July 27-28*—Central Electric Railway Accountants' Association, Detroit, Mich.**

***Aug. 16-17*—Wisconsin Utilities Association, Transportation Section. Sheboygan, Wis.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

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especially is so interwoven with good salesmanship, said Mr. Smith, that in his opinion any sales training must include the elements which are responsible for a reduction in accidents. The best salesmen are likely to result from the careful selection of employees by the employment division, sufficient training of these new men, the promotion of practical welfare work, and specific sales instruction for all trainmen. Outlining some of the organization details of the proposed sales division in his own company, Mr. Smith reiterated that the first concern is to make a business family out of the official organization. A feeling of suspicion and frequent misstatements of facts will result if any employee is left to his own conclusions on company policy. There must be a coordination of effort to obtain the prestige that should be attached to the various positions held by "key men." Concluding, Mr. Smith declared that while volume of traffic has increased on some properties the improvement for the industry as a whole does not cause complete satisfaction; that while considerable progress has been made in the physical plant, in speeding up schedules, etc., corresponding strides in sales activities have been lacking. "We must cast aside any negative attitude, cease telling how the transportation industry differs from all others and urge that our railway associations, in particular, make special research on the problem of definite sales instruction for transportation employees.

Making Salesmen of Trainmen

R. N. Graham, manager of railways Pennsylvania-Ohio Electric Company, Youngstown, Ohio, discussed the education of the platform employee in salesmanship, pointing out the analogous relationship between the type of salesmanship needed by the trainman and that used by the hotel employee. In Mr. Graham's opinion salesmanship as expressed by the trainman is almost wholly a point of view. If the platform man has it firmly fixed in his mind that the relation of the passenger to the company is determined by his own dealings with the passenger, and that his own prosperity and his job depend on that relationship, then the best salesmanship, so far as the trainman is concerned, is achieved. "I would not measure the efficiency of platform employees as salesmen by their active capacity to sell some intrinsic article or by their ability in arguing controversial questions in which the company is interested, but solely by the reaction that they produce upon the passenger in carrying out their duties," concluded Mr. Graham.

Of considerable interest among the committee reports which occupied a portion of Friday morning's program was the one made by L. G. Tighe, assistant general manager Northern Ohio Power & Light Company, Akron, Ohio, and chairman of the committee on the promotion of more profitable business. The report comprised a detailed résumé of conditions existing on Middle West railway properties with information concerning the efforts being made by the different companies to encourage more passenger and freight business. A brief summary was made of the factors deciding the abandonment of the interurban division of the Northern Ohio Power & Light Company between Akron and Canton and the substitution of a fleet of Twin Coaches to handle the traffic.

Entertainment features of the sessions at Cedar Point included a banquet Thursday evening, golf and baseball games both afternoons of the two-day meeting, and bridge for the attending ladies.

The next convention of the association will be held in Indianapolis, Ind., Jan. 24-25.

A.A.A. Motor Bus Division Meets

CINCINNATI was the center of interest to bus operators when the Motor Bus Division of the American Automobile Association held its annual meeting at the Hotel Gibson in that city, June 27-30. Welcomed to the city by the Hon. Murray Seasongood, Mayor of Cincinnati, the delegates and visitors made up in interest and enthusiasm for what they lacked in number. An interesting program of business and entertainment had been provided and the meetings were distinguished by the high character of the papers presented and by the discussion which followed. A. M. Hill, chairman of the Motor Bus Division, presided and was ably seconded by John M. Meighan, secretary. An official tone was imparted to the gathering by the presence of R. O. Self, motor bus commissioner of North Carolina; W. W. Goodwin, motor bus commissioner of South Carolina; and Judge F. A. Sanders, bus supervisor of West Virginia.

In his address of welcome Mayor Seasongood spoke of the difficulties that were confronting bus operators and expressed the opinion that federal aid alone would solve the vexing question of interstate operation. In presenting the report of the legislative committee S. A. Markel detailed the numerous meetings that had been held and the appearances made before various public service commissions and legislative bodies in an effort to iron out the perplexing questions of interstate operation, restrictions as to dimensions, fees, etc. He expressed the opinion that legislative work constituted the major activity of the Bus Division.

Opposition to the Parker bill as at present pending before Congress and as supported by the Bus Division appears to come principally from the N.A.C.C., and the activities of this organization in obstructing the passage of the bill were the subject of a bitter denunciation by Mr. Markel.

Responding for the N.A.C.C., E. F. Loomis, secretary of the bus and truck division of that organization, defended the position taken but expressed belief that differences could be adjusted in conference. The N.A.C.C. takes the view, according to Mr. Loomis, that bus operation should and can be a monopoly, but that Congress should not have to consider economic questions as to the equities of rail and trolley as predominant factors in regulation.

In spite of certain onerous restrictions and vexing regulations it was the sense of the meeting that the bus had, in most cases, received very fair consideration and that it had thrived under regulation of state commissions. The future of the industry, according to those present, is dependent upon a continuance of this spirit.

In presenting the report of the committee on equipment development, Chester Moore, secretary Illinois Motor Bus Association and Eastern representative of the Pickwick interests, drew attention to the advance that the past year had brought about in refinements of body design. Fred Klock presented the report of the committee on uniform specifications. It was the opinion of the committee that rules should avoid limiting width and length of vehicles and that future legislation should permit of such flexibility as would encourage rather than retard the development of the art. That bus men are already confronted with the problem of the free or reduced-fare rider was emphasized in the report of the clergy bureau. In view of the fact that certain practices had already developed which it would be difficult to abolish, it was decided to take no official action but to leave matters to the discretion of the individual operator. The committee on schedule information and terminal development reported that great advances, particularly in the appearance and make-up of time-tables and the dissemination and better arrangement of schedule information, are being made.

At the noon luncheon, held at the Hotel Gibson on the first day, a paper entitled "The Motor Bus—a Specialistic Transportation Unit," was presented by Frank R. Fageol, president Twin Coach Corporation, Kent, Ohio. Mr. Fageol cited the progress of the bus during its comparatively short existence and predicted that its economic use would continue to increase.

Howard F. Fritch, president Boston & Maine Transportation Company, Boston, Mass., set forth in his paper at the afternoon session how bus service of his company was being successfully coordinated with the railroad service of the Boston & Maine Railroad, the parent company.

"Equipment Maintenance and Its Importance in Bus Operation," was the subject of a paper by A. E. Hutt, analytical engineer Vacuum Oil Company. Mr. Hutt stressed the value of lubrication as "preventive maintenance" and outlined a system for motor coach maintenance, based on practices employed by many successful operators.

On Wednesday evening those in at-

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tendance were guests of the Cincinnati Motor Coach Association at a banquet, held at the Hotel Gibson.

The Thursday morning session opened with the presentation of a paper on "System in Motor Bus Operation," by Guy A. Huguelet, president Consolidated Coach Corporation, Lexington, Ky. In addition to explaining the duties of the various officials and committees of his company and the organization of each department, Mr. Huguelet described in detail the system's safety department and emphasized the importance of safety work in bus operation.

The paper of E. Blythe Stason, professor of law, University of Michigan, on "Commission Control Over the Certificate of Convenience and Necessity," told in detail of the intricacies of the very complicated and perplexing legal phases with which the state public service commissions are constantly confronted. Professor Stason indicated the nature, source and general limits of the power given commissions to control the certificates, pointed out the importance of a fair and scientific development of the rules of law under which commissions exercise their power and showed by actual cases some of the problems met in the development of these rules.

Edward A. Keenan, advertising manager Philadelphia Rapid Transit Company, in his paper "Merchandising the Bus Business," explained the methods employed by his company in promoting traffic on its bus tours and pointed out that almost 4 per cent of the total estimated receipts from bus operations are being set aside for advertising. His talk was illustrated by samples of billboard and poster advertising used by his company.

The American Automobile Association sponsored a luncheon for the delegates on Thursday. At the final business session of the division on Thursday afternoon, Arthur M. Hill and John M. Meigham were re-elected chairman and secretary of the division, respectively. In the evening the delegates assembled for an informal banquet. The remaining two days, Friday and Saturday, were devoted to various forms of entertainment, including several sightseeing tours.

Organized Safety and the Electric Railways*

By F. C. Lynch
Director Kansas City Safety Council

WHERE the accidental death rate in an industry has been reduced more than 50 per cent in a period of fifteen years, it might seem needless to present any further arguments for an increased participation in organized safety work. However, with the personal injury and property damages running as high as 40 to 50 per cent of the legalized net earning, we can still afford to give some thought to the relation of organized safety to the electric railway industry.

In the organized safety within the industry itself, we find two general classifications for consideration, the maintenance department and the transportation department. In the maintenance department, safety can be introduced by adopting the principles which have proved so effective in industrial plants. The introduction of safety into the industrial end of the organization improves the relationship between the men and management. It affords a common ground where both can meet with the same objective in view and one where the benefits will be shared alike. The efficiency of the organization will be increased because the attitude of the men will be better. Organized safety means a more scientific analysis of the job each workman is to do and includes the proper education of the workman in his particular duties and responsibilities. The increase in efficiency will bring the third result of safety—cost reduction. The reduction in costs is not alone due to increased efficiency, but also to the reduced compensation payments and the losses which accidents contribute. It has been estimated that the indirect cost to a shop from an accident is four times the direct cost of compensation and medical expense.

For safety work in the transportation department the basic principles are the same. Usually the men on the cars are more receptive than the men in the maintenance departments since hardly an hour passes in their daily routine but what they see the need and the effect of accident prevention. With the platform men there is an increased efficiency in the manner in which the work is performed, a reduction in the cost not only in the direct compensation and medical expense, but in the elimination of indirect charges and costs such as interruptions to service and the loss of the use of the equipment and the operator's services.

The management should keep in mind that safety work is unlike most progress in that it must begin at the top and work down through the organization. Likewise, the management should not forget that it must establish the right to make the appeal for co-operation from the men before the appeal is made by analyzing its problems, planning its campaign, and performing the preliminary work of furnishing safe equipment and safe operating regulations.

Just as the differences between the men and management are more easily eliminated when an opportunity is provided of meeting upon common ground to discuss their respective problems, so the electric railways by supporting the local safety council are able to establish an avenue of contact with the public in which no prejudice exists. A local safety council, properly organized, is governed by a board of representative citizens. The investigations and recommendations furnished this board of governors are produced by special committees upon which are represented every phase of civic life.

Educating the Public a Big Task

Most students of accident prevention have unanimously agreed that in public safety work the principal task is educating the people so that they will properly recognize and avoid hazards. The steam railroads for some time have had their representatives visit schools and talk to the children on the subject of community safety, emphasizing the matter of trespassing upon the steam railroad property. However meritorious this work may be, these men are working against the resistance which is set up in the minds of the audience by the realization that they are promulgating this idea for selfish purposes.

Contrast that scheme with the plan which is used in a city having a local safety council. The street railway presents its problem to the safety council. This is immediately referred to the children's activities committee, which is made up of about 50 per cent representatives of the Board of Education with the balance of the committee being composed of representatives from the Parent-Teacher Association and business men. Through this committee, the message is taken to the children by the school teachers in a prepared course of instruction in safety which is used as a guide in teaching accident prevention work. There is no resistance as the children quickly realize that the sole purpose is to protect them from possible injury. In submitting this problem, the committee quickly realizes that the benefactors are not the electric railways but the children and their parents. This same problem receives a favorable position in the press, because when it is presented by the children's activities committee the editors quickly realize that they have a moral responsibility in the protection of the children of the city and they are quick to recognize it. Their participation in the work is a very definite contribution towards the successful accomplishment of the program.

Street Safety a Real Problem

There is no problem confronting the electric railways today any greater than the problem of street capacity and street safety. This matter of street safety is of course one in which the safety council is primarily interested and, inasmuch as it is so closely related to street capacity, both are receiving constant attention. There has been no one item which has contributed so greatly towards the street safety and street capacity as the establishment of safety zones. At the same time, there

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perhaps is no other practice which is as much misunderstood as is this particular one. There are many people who look upon the safety zone as something which is established for the benefit of the electric railways. It does little good with these particular people to point out to them that safety zones are for pedestrians and are even established on streets where there are no street cars. With a safety council's traffic committee, composed of representatives of the administrative, legislative, enforcement and judicial branches of the city government, together with representatives from the park board, transportation corporations, the Automobile Club, the Merchants' Association, Real Estate Board, and a group of eminent engineers recommending the establishment of safety zones, it is obvious that the public will accept these recommendations in the light of safety regulations, not as special concessions to the electric railway industry.

The electric railway industry has long since realized the inequitable regulations which require street cars and motor vehicles to obey traffic control signals and at the same time permit the pedestrian to move with an utter disregard for such signals. The traffic committee of a safety council opens up an avenue where such questions and needs may be presented without incurring the ill will of the public. In this type of safety campaign, the street railway is able, through the safety council, to take the position of a public benefactor rather than the position of an agitator for additional regulations.

The humanitarian appeal of this work together with the advantages which your participation will bring, are sufficient to justify support of an organized safety movement. Accidents do not happen, they are caused. By removal of the cause you prevent the accident. Some of the industries have reduced their accidents as much as 90 per cent over a period of fifteen years. The same opportunities exist in public accident prevention work. Would it not be immensely worth while to reduce personal injury and property damage charges by 10 or 20 per cent and credit this to the profit and loss ledger, if by so doing we could win the good will and support of the public and speed up our schedules?

Rigid Track Construction*

By A. E. HARVEY
Superintendent of Construction Kansas City Public Service Company, Kansas City, Mo.

IN DESIGNING a modern paved track there are three important points to be considered:

A foundation amply sufficient to carry cars and trucks of maximum weight.

A track that will have the longest life.

A pavement of such material as is most satisfactory for use in car track areas.

These three points should be combined in such a way that there may be no movement of one part in relation to the other. Movement is bound to produce fractures and openings permitting wear, the entrance of water, increasing maintenance costs, and eventually the disintegration of the entire structure.

In the design of paved track probably the most important question is whether it should be rigid or resilient. If track is made resilient there must be some movement of parts in relation to the others, thus sacrificing permanency. A ballasted track which is resilient and, in many cases, flexible, may be considered as constructed in three layers: the ballast, upon which is laid the track, and the pavement which is placed on top of this. In this kind of track much dependence must be put on a heavy bed of ballast well tamped, and on the stiffness of the rail, calling for heavy sections 7 in. or 9 in. deep. A greater depth of structure is required and more material and labor than to secure equal stability in track built in solid concrete.

The solid or rigid type of track consists essentially of a concrete beam of the width of the track, reinforced with rail and steel ties. Such a structure gives a more even distribution of the loads upon the subgrade, and a greater beam strength with less depth of concrete and rail than in the ballasted track, making a saving in cost of rail, excavation and ballast without sacrifice of strength or permanency.

Careful consideration should be given in the designing of this type of construction to the detail of the various parts that go to make up the track proper. The rigid or monolithic construction does away with the necessity of a high rail section designed to secure stiffness, and paving practices are being adjusted to the use of rail of lower sections. Where the general design of the track permits, the low sections of T-rail have a decided advantage on account of lower cost and because the rail head is generally deeper, giving a longer wearing life.

Ties have been the most perishable part of a track structure, so that in their selection the most permanent material should be specified. Wood ties should be either of white oak or, if more perishable woods are used, they should be treated. In the use of solid concrete the importance of a tie or bearing is largely eliminated, as the bearing is largely concentrated under the rail, so that steel ties are better adapted to use in solid concrete than are wood ties.

Two points should be considered in the designing of a steel tie: a large bearing area between the tie and concrete and a secure method of fastening the tie to the rail. It must be kept in mind that the rail must not only be held up against the load but that it must be held down securely. The failure of ties, whether of wood or steel, is generally due to the rail cutting into the tie. This can be prevented only by the most rigid fastening.

Bad joints have been the curse of track since the beginning. Paving of tracks has only multiplied the trouble. The designer of a modern track may have the choice of many improved joints, but there is but one complete answer for this trouble; eliminate the joint and make the rails one. For general use the thermit weld appears to be the most practicable both from convenience of installation and results. There are a number of other joints of the seam-welded type, but in the strictest sense of the word they are not welded joints because the joint is not eliminated, plates being used and secured by seam welds to the rail instead of by bolts.

Proper drainage of the subgrade must not be overlooked. Whenever there is any question as to accumulation of water a drain tile should be installed beneath the ballast or slab. This is most important in stone ballasted track, as there is a greater liability of the entrance of water through the paving on such structure.

An equally important feature of good track construction is the final work of placing the concrete and paving. Only the best stone and sand should be used. Bad aggregates will give poor results. Concrete should be mixed in as large a machine as practicable and turned the full time specified. The last few turns of a mixer have much to do with the final strength and the workability of concrete.

Concrete must be thoroughly tamped as it takes its initial set to give a full bearing under not only the tie but the full length of the rail. No matter what the consistency, concrete will not flow naturally under these surfaces and give a complete bearing. If left untamped or tamped too soon it will shrink away from such surfaces; however slight this shrinkage is, the bearing will be incomplete, permitting movement and resulting in cracks and crevices for the entrance of water.

Whatever the form of pavement, it should be laid in a plane with the top of the rail. Crowning results in heavy shock to pavement and track where heavy loads cross at high speed. The impact of a heavy load will in a short time cause breakage in anything but the heaviest pavement and foundation and will also produce a blow upon the rail, which, if transmitted through the rail and tie without similar pressure or blow upon the pavement, will separate the track in a downward direction from any paving structure that lies above the base of the rail. The only variation from this practice that should be made is, first, that the pavement on the outside of the rail should be low enough so as not to form contact with the tread of any worn wheel that is wider than the head of the rail; second, that the flangeway where T-rail is used should be made

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only of such width as will accommodate the flange and of such contour as will free any material lodged in the flangeway and permit it to be pushed up and out of the way by the passing wheel.

Where tram sections of rail are used the bevel on the outside edge of the rail prevents any damage that might occur on account of the worn treads. On the gage side of the rail the paving material must necessarily come flush with the top of the lip of the tram. This leaves a difference in height of pavement and the top of the rail on the outside edge to the amount of the chamfer on the edge of the rail and the top of the lip of the tram on the gage side. This is a variation which still exists and may be the cause of a blow under heavy loads but it will be small and need not be considered as serious. It can only be removed by making extensive changes in rail sections.

A study of practices of the more important properties show a decided increase in the use of solid concrete construction and steel ties and in the use of concrete pavement. The fact that some of the early construction along this line gave indifferent results was due to lack of experience, information, specifications and workmanship. The decided trend of the past few years toward the use of this type of construction is an indication that these matters have been largely solved. It is too much to expect that there will be a definite standard of track construction adopted by any association, but the indications are that the modern track constructed in the next few years will be along the lines described.

Economic Aspects of Renewal Parts Problem*

By E. C. Brandt
Assistant Works Manager
Westinghouse Electric and Manufacturing Company

SOMETIMES renewal parts are furnished at normal cost for six months, and then at a little higher cost as time goes on. Certain automobile manufacturers replace parts for seven years at a normal cost and from then on at extra cost; other corporations furnish maintenance and renewal parts for any apparatus which they have ever built and which is still in service.

Several years ago, the service to our customers in supplying maintenance and renewal parts became one of our major considerations. A selected group of men, who were acquainted with the company's apparatus, its development and progress over a period of years, made a complete study of this situation. They had all the company's records of the apparatus sold, its users, etc., together with the past sales records showing the parts purchased, engineering data and tests, and the approximate life of every wearing part. They also had a complete analysis of what the user manufactured himself, purchased from other suppliers and what they purchased from our company. This made it possible for the group to estimate the total production and requirement of each individual part for all equipment which was in service.

Several types of equipment were classified, namely—current apparatus, or that which is up to date and of the very latest design and is in production at the plants; non-current apparatus, or that which is in service by our customers, giving good service and still having a long time to operate but requiring maintenance and renewals; and obsolete apparatus which is no longer economical to run and has been scrapped, or should be scrapped. The latter two classifications are the ones for which the Westinghouse renewal parts plant is supplying parts for today.

The group that studied this situation made the recommendation that a plant devoted exclusively to the manufacture of these parts should be erected. With the information available it became a comparatively easy problem. The Westinghouse Company is now in a position to produce by a group of skilled workmen, engineers and plant supervisors, renewal parts for any Westinghouse apparatus still in operation. We are promoting the idea that the original manufacturer should furnish all renewal and maintenance parts and service his own equipment so the customer will obtain the best results and maximum output at all times.

The maintaining of stock for renewal and maintenance parts was given considerable thought and study. This was arrived at from records which had been kept for years and in this way knowledge was obtained and a minimum available stock established. Parts were manufactured in the largest quantities possible in order to obtain the very best cost; other parts had to be built on special orders due to their activity not being high enough to warrant manufacturing in quantities for stocking purposes.

Based on our past experience and by having activity records we are able to carry a stock of parts either at the manufacturing works (whose stocking facilities are limited) or in the district or zone warehouse, where immediate shipment to the customer can be made. However, in the case of special parts required by any customer, the order is immediately referred to the manufacturing plant and every effort is made to expedite an early delivery. We have found it difficult to carry a finished parts stock at all times with the many hundreds of thousands of parts which Westinghouse may be called on to furnish for its apparatus which has been manufactured in the last 40 years, but by having available the activity records (which are being kept every day) better results can be obtained.

The main advantage which is being gained by the promotion of the renewal and maintenance part factory is that the customers are buying renewal and maintenance parts direct from the original equipment manufacturers, and by centralizing all our customers' requirements in one place, quantity production is being realized more each day, and the general cost tendency to everyone concerned is being brought lower.

The original manufacturer of any equipment cares more than anyone else about its operation and the satisfaction it is giving the customer. Therefore, he is very ambitious to see that the customer has the best renewal and maintenance parts and the best service possible at all times. Parts are made from the same specification, drawings, best materials and backed by scientific engineering, the same as the original apparatus purchased many years ago by the customer.

The automotive industry has placed the matter of service and genuine renewal and maintenance parts on a sound basis throughout the world. All the people who own and operate cars for their own personal use, insist that the car be maintained and have genuine parts for the particular make of car purchased from the nearest authorized service department.

It must be remembered that when you require renewal and maintenance parts for any equipment, you cannot buy good, and at the same time buy cheap, genuine renewal and maintenance parts. It is a fact that any part for a repair or renewal will work, but how long and how well is another matter. In the majority of cases the cost of the part is only a small item of the total cost of installation. Your decision as to what kind of service and parts are installed on any kind of equipment can be based on the importance of the work it is to do, how long and how well it will do the work before another replacement is necessary. The law of average has proved it is always best to use high-grade, genuine renewal parts made by the original specifications, serviced by the original equipment manufacturer, backed by scientific engineering and also—the most important factor—backed by the one who cares how your equipment operates and the service you obtain from it.

I believe it was the laxness of the equipment manufacturer in realizing the equipment users' problems. Therefore, the different properties using equipment analyzed their situation in different ways and by different people. The various executives saw things differently; the maintenance supervi-

**Abstract of a paper presented at a meeting of the New York Electric Railway Association, Coney Island, N. Y., June 14-15.*

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sors saw things differently and this reflected down the line through the master mechanic who has different ideas and ways of doing things in the many shops all over the country.

The usual way to make a repair is with the equipment and material available or most easily and quickly obtained, although it is not the most economical. The traction properties main business is selling rides and a car or a bus tied up in a shop for repairs cannot carry passengers. Therefore, in order to keep and put cars on the tracks the different companies resorted to nearly every measure and the World War is largely responsible for the neglect which was shown by the equipment builders in not paying enough attention to their customers' maintenance and renewal part requirements and the equipment users were forced to do something themselves. Some companies have made a very good job of this entire situation while others have only added difficulties to their many problems.

Every traction property should have a modern and well laid out maintenance shop where the proper repairs could be made in the most economical way. All renewal parts should be furnished by the original equipment supplier who must furnish standard maintenance data information and engineering service to its customers and in this way the standard will be nationally established. This is an absolute necessity to meet our national economic situation.

The railway properties should not manufacture parts but should have a standard set-up for maintenance machining of worn surfaces so that the standard renewal parts can be quickly put in place and cars put back on the street in a minimum time. Spare standard parts are recommended as a solution.

A standard part is one which can be used on a certain type of motor in Boston, New York, Chicago, Cincinnati or San Francisco and can be produced in a central shop in large quantities and sold at a minimum price to the users. However, if we are going to make such apparatus in more places in small quantities, we must pay more and every time a new place is established for making the same things, somebody pays for a set of patterns, dies, drill jigs, fixtures, machine tools, buildings, engineering drawings and specifications, coil formers, moulds, etc. Surely the time must come when we must consider this situation broadly from a national viewpoint.

The larger manufacturers have all the facilities for handling and manufacturing, not only for complete apparatus but for maintenance parts. They have specialized in the study of the time required to perform every operation in all its branches. We feel quite sure that if all the facilities which the larger manufacturers have to offer are taken advantage of a more economic national condition can be realized.

American Association News

Brady Awards Offered Again

NICHOLAS F. BRADY has again authorized the award of the Anthony N. Brady Memorial Medals for best accomplishment in accident prevention and health promotion by electric railway organizations in the United States. These awards will be for the year ended Dec. 31, 1927, and, as in the past, will be made under the joint auspices of the American Electric Railway Association and the American Museum of Safety. The gentlemen who were members of the committee on the award and the committee on the conditions of the competition have kindly consented to serve again. They are:

Committee on the Award — Lewis Gawtry, chairman, president the Bank for Savings; Col. A. B. Barber, manager transportation and communication department U. S. Chamber of Commerce; James H. McGraw, president McGraw-Hill Company, Inc., Lucius S. Storrs, managing director American Electric Railway Association.

Committee on the Conditions of the Competition—Thomas Fitzgerald, chairman, vice-president Pittsburgh Railways; H. K. Bennett, safety manager United Electric Railways, Providence, R. I.; C. H. Evenson, superintendent of transportation Chicago Surface Lines.

As was done last year, three medals are to be given, one of gold, one of silver, and one of bronze, all as first prizes in the folowing classes, respectively: (a) Electric railway organizations operating more than 5,000,000 vehicle-miles; (b) those operating more than 1,000,000, but not over 5,000,000 vehicle-miles; (c) those operating less than 1,000,000 vehicle-miles.

The committee of award may also, in its discretion, make honorable mention of one or more electric railway organizations, based on the same criteria as the award of the medals, or any other factors that may appeal to the committee as especially worthy of commendation.

Attention is called to the fact that the conditions, through their general terms and comprehensive requirements, make it possible for all electric railway companies, no matter how small, or of what nature, or having whatever conditions of operation, to present their own cases in the way permitting the best consideration of their records and the conditions under which their accomplishments have been made.

The conditions, as announced by Arthur Williams, president of the American Museum of Safety, are as follows:

Every competing company shall include data covering all electric railway and bus operations comprising the entire system of which it is a part, without regard to technical ownership. The test ordinarily would be operation under the jurisdiction of a single president.

The attention of companies is particularly called to the fact that their presentations should cover broadly, and as completely as possible, all of the factors prescribed by the committee as conditions for obtaining the award. Weight will be given by the committee to these factors in each company's presentation, based upon their relative accomplishments under each heading. The factors are:

1. The success in gaining good will as indicated by the initiative, skill and enterprise manifested in improved safety conditions.
2. The improved safety conditions which have resulted from original ideas, as well as the extent to which the company has taken advantage of new development of safety in operating and maintenance practice and equipment originating with others.
3. Improvements in safety practice which have resulted in reduced maintenance, or greater reliability of service.
4. Particular success in conducting a safety program and actually reducing the number, seriousness and cost of accidents reported on the association's form. It is understood that all accidents (including miscellaneous) should be included whether chargeable or non-chargeable.
5. Outstanding accomplishments in development of co-operation between management and employees in safety promotion.
6. Outstanding accomplishment in measures to promote sanitation and health.

Additional conditions of the contest are as follows:

7. All presentations must be in the hands of the American Museum of Safety on or before Oct. 1, 1928.
8. Submission of a presentation gives to the committee permission to publish it in whole or in part over the name of the company after the award has been decided on. (If desired, a company may mark certain parts as confidential and these will not be published, although they must be available for reference at Association headquarters to members.)
9. Presentations must cover, as far as possible, accomplishments occurring in the year ending Dec. 31, 1927. (Accomplishments, however, extending over a period of years and reaching their fruition before Dec. 31, 1927, will be considered by the committee.)
10. Presentations should be written on standard typewritten sheets and accompanied by such supporting figures and drawings as may be required. (Permission is granted to print presentations, although the committee prefer that this be not done.)
11. Statistics on a car-mile or other unit basis for the year 1927 in comparison with the previous three years are desirable as evidence of actual accomplishments. These should be reported on the association's forms 342 and 343, copies of which will be furnished upon request.
12. The committee on award may also take into consideration other factors or conditions, if any, which in its judgment have a bearing on the relative accomplishment of any electric railway or railways in the field of safety.

Have You Completed Your Plans to Attend the

A. E. R. A. Convention

at Cleveland? September 22 Will Soon Be Here

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News of the Industry

Three Measures Suggested for Boston Elevated Situation

The special committee of the Massachusetts Legislature, appointed in response to a special message from Governor Fuller to draft new legislation for the Boston Elevated Railway in a final attempt to settle that situation this year, has unanimously reported three measures in the Senate.

The first is a bill calling for the extension of public control of the Elevated for a period of twelve years and a dividend rate of 5 per cent on the common stock; the second is a resolve asking the Governor to appoint a special commission to study the question of further rapid transit line extensions in Boston, and the improvement of existing lines; the third is a resolve authorizing the Boston Transit Department to construct an extension of the Boylston Street subway under Governor Square, which appears to be the most sensitive spot on the Elevated lines today.

It is provided in this third measure that the work in Governor Square shall be paid for by bonds issued by the city of Boston, but before the work is started the Boston Elevated would be required to lease the extension at a rental of one-half of 1 per cent of the net cost plus the interest on the bonds.

These measures will be discussed first by the Senate and then by the House.

Ten Cents Sought in Decatur

The Illinois Power & Light Corporation has filed with the Illinois Commerce Commission schedules which, if approved, will establish a 10-cent cash fare basis for buses and street cars in Decatur, Ill. Three tickets will be sold for a quarter.

Transportation revenues of the Illinois Power & Light Corporation in Decatur have declined materially this last year. The rate is the first increase sought in Decatur since 1921, when the 5-cent tariff was raised to 6 cents. Similar schedules are to be filed for the Quincy, Burlington, Jacksonville and Champaign lines.

New Agreement in Connecticut

The second vote by trolley workers showed definitely that the Connecticut Company would not be hampered in its operations by a strike. Several weeks ago the workers voted to authorize union leaders to declare a strike, but apparently did not understand the real significance of the power they were delegating to others.

Under the agreement now arranged the workers will receive the same wages and serve under practically the same working conditions as in force previously. The agreement does, however, embody minor changes. A bus driver under the new status can switch to trolley service or vice-versa. The Connecticut Company does not recognize the trolleymen's union, but agrees to recognize committees representing the trolleymen. The new agreement will terminate on June 1, 1929. It has been the subject of long negotiations, reviewed step by step in the JOURNAL.

10 Cents Cash in Sandusky

The City Commission of Sandusky, Ohio, on June 25 accepted an ordinance under the terms of which the Lake Shore Electric Railway will be allowed to charge a 10-cent cash fare with seven tickets for 50 cents. The present fare is 5 cents cash with six tickets for a quarter. The company will not be allowed to abandon lines without the city's consent and may be required to substitute buses should a railway line be abandoned.

Subway Problem in Philadelphia

Mayor wants terms fixed for operation of Broad Street subway, soon to be placed in service. Asks commission's aid. City to prepare to run road

AT MAYOR MACKEY'S request, the City Council of Philadelphia, Pa., has unanimously passed a resolution calling on the Philadelphia Rapid Transit Company to join with the city in a petition asking the Public Service Commission to formulate an equitable agreement for operation of the Broad Street subway for two years.

In a message to the Council Mr. Mackey said he would propose to the commission that the P.R.T. pay the carrying charges of $4,900,000 a year which the city has been paying on the $87,656,000 line in return for the operating privilege during the two-year period, and that the company provide that rental amount in advance the first year as an earnest of good faith.

The customary procedure has been reversed in having the commission define the terms of a city-company contract preliminary to its official review of the agreement which the Council will ultimately pass.

It is expected that the Broad Street subway will be ready for operation over two tracks from its northern terminus at Olney Avenue to the Race Street station, with a single-track extension into its temporary terminus under City Hall, by Sept. 1, 1928. The extension to South Street should be ready for operation some time within the next twelve months or shortly thereafter. The Mayor said:

This administration found the Broad Street subway on its doorstep when it took office on Jan. 2, 1928. It was projected and financed long before I became Mayor, and it was obviously my duty to hasten construction to the point where the subway could be put into practical use as quickly as possible.

The portion of the subway from City Hall to Olney Avenue has cost the city $87,656,000. The magnitude of this undertaking is apparent when it is realized that this is close to one-third the value of the entire transit system now serving the city.

The Broad Street subway, with carrying charges of $4,900,000 a year, will have total gross earnings, under the most optimistic estimate, of only $4,000,000. The Philadelphia Rapid Transit Company system, with carrying charges of $14,000,000, has an annual gross of $58,000,000.

The total cost of the subway, Olney Avenue to South Street, will exceed $100,000,000, with total carrying charges of about $6,000,000 a year. Thus a transportation line of 6 miles in length requires carrying charges close to one-half those of a system with total mileage of 1,000 miles. To merge these two systems economically is no easy task.

The estimates of the City Transit Department, based on a traffic survey conducted during March and April of this year, indicate that approximately 75,000,000 passengers a year will be diverted from the Philadelphia Rapid Transit Company surface lines paralleling the Broad Street subway, if these lines are so routed as to bring the maximum number of passengers into the subway, with free transfers as now.

It would be unjust and futile to ignore the effect which this diversion will have on the Philadelphia Rapid Transit Company's earnings, and this has been the principal factor in convincing me of the necessity of looking at this problem from the standpoint of the final result to the city-wide system.

Whatever the terms of the contract upon which the city and the Philadelphia Rapid Transit Company might agree, it must have the approval of the Public Service Commission before it becomes effective. This contract is definitely affected by special considerations which are particularly and exclusively the function of the commission to decide.

The rerouting of Philadelphia Rapid Transit Company lines so as to serve the subway adequately, the fare and transfer arrangements, and the effect of both on the return possible to the city for the support of the city-built system, are all mat-

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ters upon which the commission will have the ultimate and deciding voice, and because of this the city cannot bind the Philadelphia Rapid Transit Company by making them a matter of contract.

Attention is then called by the Mayor to the fact that the Public Service Commission last year disapproved a contract between the city and the Philadelphia Rapid Transit Company, providing for the lease and operation of the Frankford Elevated Railway and Bustleton Surface Line, entered into only after months of negotiations and numerous public hearings. To avoid a repetition of this experience, the Mayor has asked the Council to request the Public Service Commission to proceed under the public service company law, to signify in advance the form and character of contract that it would approve for operation by the Philadelphia Rapid Transit Company of the Broad Street subway. He also asks that the commission be requested to investigate the expected revenues and the necessary adjustment of lines by rerouting so as to make possible the maximum use of the subway with the greatest possible return to the city.

The Mayor contends that the operating company should be required, as a consideration for a city lease, to assume the full carrying charges of the loan for a period of two years, and as an evidence of good faith and earnestness of the undertaking, to pay to the city the first year's carrying charges in advance, and then to conform, in addition to these terms, if approved by the Public Service Commission, with all the other terms and particulars as suggested by that body, the adoption of which will move the commission to approve the whole lease.

Meanwhile, Mayor Mackey has declined to disclose the details of the operating lease submitted by the P.R.T. for the approval of the city administration.

As if to anticipate possible rejection of the lease the Mayor has since forwarded an ordinance to the City Council which provides for establishment of a bureau of operation in the Department of City Transit so the city can operate the Broad Street subway in September in the event the administration and the Philadelphia Rapid Transit Company fail to agree on terms for an operating lease. The measure has been referred to the transportation committee.

Ten Cents in Savannah

Permission has been granted the Savannah Electric & Power Company by the Georgia Public Service Commission to increase its rates in Savannah, Ga., to 10 cents for a cash fare instead of 7 cents, as at present. Customers may purchase three tickets for 25 cents, or twelve tickets for a dollar. School children will pay a 5-cent fare during the nine months' school term, and children between the ages of five and twelve may use tickets sold at the rate of 24 for $1. Higher rates were sought because of losses sustained by the railway department of the company.

Mr. Sheridan's Resignation Refused

The Missouri Committee on Public Utilities Information has refused to accept the resignation of J. B. Sheridan, secretary of the committee since its inception seven years ago. Members of the committee stated it had no desire to dispense with Mr. Sheridan's services. A statement made public about the matter follows in part:

The purpose of the committee is to disseminate fair and authentic information about public utilities and public utility service, and its members have not changed their belief in the propriety and importance of this work to the users of public utility service, to the utility companies and to the public at large.

Hearing Set for Fare Plea of Queens Lines

The New York State Transit Commission on June 27 laid over for one week consideration of the application of General Lincoln C. Andrews, receiver of the New York & Queens County Railway, for permission to continue a 6-cent fare on the lines of the company. The present permit was due to expire on June 30, but the company is legally entitled to continue charging the extra cent, in view of the fact that an application for an extension of the permission had been made to the commission by the railway company in question before the expiration date.

The commission also set July 10 as the date for a public hearing on the application of the railway to abandon portions of its franchises in Queens. The petition sets forth that no portion of the particular line has been operated since Dec. 4, 1926, due to lack of patronage.

They Find It Out in Poughkeepsie

POUGHKEEPSIE has a population of between 35,000 and 40,000, yet in 1927 more than 3,000,000 fares were paid to the Poughkeepsie & Wappingers Falls Electric Railway, Poughkeepsie, N. Y. The public has discovered that it can ride to and from the business district of the town about as cheaply as it can drive to work in its own cars. For that reason there has been no great decrease in the amount of business done by the railway.

If you leave your car at home, you do not have to worry about parking regulations. There is no confusion, and you arrive safely at your destination. For women and children, the trolleys are safe. That is one important consideration in sending your children to school.

The trolleys pass near the theater district no matter what line you ride. You can reach the shopping district from almost any part of the city in a few minutes by trolley. The electric railway still appears to be a necessity.

—*Poughkeepsie Eagle-News.*

Suit to Determine San Francisco Franchise Expirations

City Attorney J. J. O'Toole, acting for the City and County of San Francisco, has filed a suit in equity in the Superior Court asking for declaratory relief in determining the dates when the disputed franchises of the Market Street Railway expire. This is regarded as the initial step to obtain court decision on the true date of the expiration of the key franchises.

In the complaint, the city states that on Sept. 15, 1879, certain franchises were granted by the city and approved by Mayor A. J. Bryant. Later, on May 29, 1882, amendments to the ordinances of 1879 were adopted by the Supervisors and approved by Mayor M. C. Blake. The complaint states that "an actual controversy has arisen and now exists between the plaintiff and defendant over which is the true expiration date."

The company contends that 1932 is the true expiration date of the following franchises:

Market Street, Ferry to Seventh.
Fifth Street, Market to Bluxome.
McAllister Street, Market to Divisadero.
Hayes Street.
Haight Street, Market to Golden Gate Park.
Valencia, Market to Mission.

Under the terms of a resolution adopted by the Board of Supervisors the City Attorney is directed to start negotiations with the company looking to a transfer of properties and equipment on the lines over which there is no dispute.

Southern Pacific Not the Buyer of Electric Power

J. H. Dyer, general manager of the Southern Pacific Company, San Francisco, Cal., denied reports that the road is negotiating with the American River Water Company for a supply of power to electrify lines over the Sierras. The company had no intention of installing electricity for motive power on its overland route in the immediate future and no negotiations were under way with any company for a power supply, according to Mr. Dyer.

The Southern Pacific Company was mentioned as a possible buyer of electric power to be generated by the American Power Company.

Bill Against One-Man Cars Lost

The committee on labor and capital of the Louisiana House by a vote of six to three has ordered an unfavorable report on the bill to prohibit street railways which operate in the state of Louisiana from running cars with one man.

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Railway Seeks to Prevent New Rates in Los Angeles

The Los Angeles Railway, Los Angeles, Cal., has filed a petition in the United States Court asking an injunction to prevent the Railroad Commission and all other persons, including City Councils, from enforcing a recent Railroad Commission order denying the company's application for a fare increase. The corporation also seeks to prevent the Railroad Commission from interfering with the charge and collection upon its system of 7 cents for each fare, or four tokens for 25 cents.

The commission has informed the Los Angeles Council that it had instructed its attorney, Carl I. Wheat, to appear and oppose the granting of these injunctions and asked the city to co-operate in resisting the move of the railroad. The hearing has been set for July 12, in Los Angeles.

Opinions on Seattle's Taxicab Venture Awaited

The City Council of Seattle, Wash., with three taxicab proposals before it, has asked T. J. L. Kennedy, corporation counsel, for an opinion on the legality of a proposition submitted by Sam Taggart, to take over the entire taxicab business of the city. Until it receives that opinion, and probably an opinion from the department of business administration of the University of Washington, the Council has decided to shelve all taxicab legislation. Mr. Taggart's proposal is to buy up all existing taxicab companies in the city, deed their equipment to the city, and take an exclusive operating franchise for 40 years, paying the city 2 per cent of the gross receipts, amounting at the start to approximately $50,000. The agreement would provide that at any time the city wanted to take over the operation, or any time any other company offered a better proposition, the city would be at liberty to accept it. This proposition is financed by Seattle capitalists.

One in Sixty Cleveland Overhead Record

Fifty-five linemen with their immediate superiors and officials of the Cleveland Railway, Cleveland, Ohio, bringing the total up to 70 persons, were tendered a dinner on May 14 as a mark of appreciation of their having completed a period of 60 days on May 3 without a break of the overhead line distribution system. On May 3 this long period of exceptional service by the department under the direction of James Scott, as superintendent, was interrupted by the breaking of a sectional insulator. It was the sixth break of the year. More than sixty days in a city the size of Cleveland is of course a record not easy to duplicate. But the system there has been going ahead steadily in this respect as the fanciful program for the dinner made plain, showing as it did by chart what has been achieved. Moreover, the bill of material, or the menu, was prepared with an especial appeal to the line boys. Incidentally this program was the product of the power department, of which Lawrence D. Bale is superintendent, the line division being a subsidiary of the power department. The bill of material, which, of course, contained its own hint as to what the items on the menu were all about, was as follows:

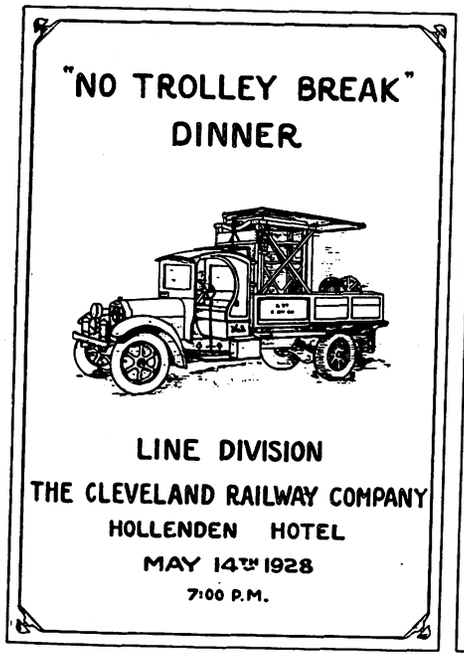
Bill of Material

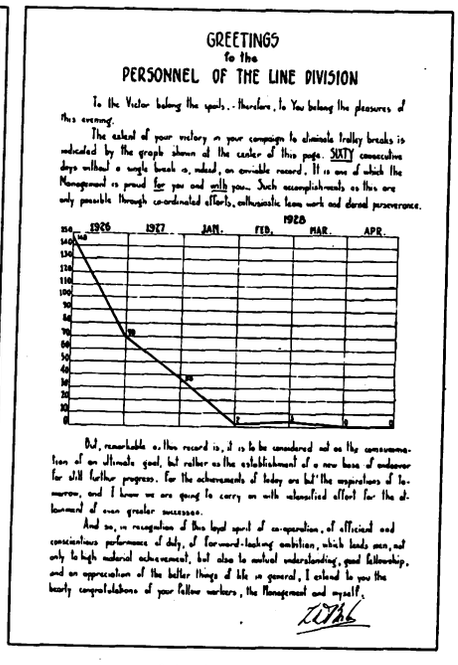
Hangers — Ears

Pole Paint
1,000,000 C.M. Cable

Crosbys — Chucks

Scraps
Make-Ups
Soldering Acid
Fuses





Menu card at Cleveland dinner was unusual in its display

New Accident Prevention Plan in East St. Louis

Each motorman, conductor and bus operator of the East St. Louis Railway, East St. Louis, Ill., and its subsidiaries who goes through a twelve-month period without a single chargeable accident will receive a bonus of $36. This is the gist of the accident prevention bonus plan announced by the affiliated railways effective on April 1. Each employee eligible to participate in the bonus plan receives a credit of 36 points. For each chargeable accident a certain number of points is deducted. A safety department board composed of members from various departments will investigate all accidents.

$14,000 Spent by Louisville Railway in Jitney Case

The Louisville Railway, Louisville, Ky., recently entered into an agreement to pay members of the Independent Jitney Bus Operators' Association approximately $200 each, under contract, whereby the established buses would be taken off the streets, blocking any legal battle regarding the new law taking away property without compensation. Sixty-six members of the association received $212.12 each, and settlements were made with about fourteen others not in the association. It was announced that no settlements would be made with any operators who had organized after the law was enacted and while the matter was in controversy.

All jitneys were ordered off the streets at midnight, June 30, at which time the law under which no bus can operate without a city franchise became effective.

Food Industries, a New McGraw-Hill Paper

The McGraw-Hill Publishing Company will publish, starting with the October issue, a new monthly, *Food Industries*, for the men interested in the manufacturing and processing of foods.

Food Industries will cover the technology of manufacturing food products, methods of food production, materials used in food processing and packing, materials of construction for equipment, handling of raw materials and finished products, research on food preservation and preparation, bacteriology, sanitation, improvement of processes and reduction of costs. In general, the paper will be devoted editorially to plant operation and production methods in the food industries.

Editorial direction of *Food Industries* will be under Dr. H. C. Parmelee, editor of *Chemical and Metallurgical Engineering* and vice-chairman of the editorial board of the McGraw-Hill publications, who will continue in those executive positions with McGraw-Hill. He will have as his editorial associates men selected from the food industries. Their names will be announced later.

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New York City Protests Surface Fare Increase

New York City on July 3 filed with the Transit Commission a formal protest against granting a 7-cent fare to the Drydock, East Broadway & Battery Railroad, a subsidiary of the Third Avenue Railway, which last month filed schedules calling for the increased rate. The city also objects to the granting of the petition to allow a 2-cent transfer charge between the Drydock line and the Third Avenue Railway system.

The protest was referred by the commission to Clarence M. Lewis, its counsel, to whom the company's petition has already been sent for legal opinion.

Increase Denied Chicago Elevated Railways

A denial of the Chicago Rapid Transit Company's application for 20 per cent increase in rates was issued by the Illinois Commerce Commission on June 28. The company had asked permission to discontinue the sale of three tickets for 25 cents and of $1.25 weekly passes and to substitute a straight 10-cent fare.

The commission based its rejection on the fact that the company had increased its business materially with the present rate structure and on the theory that a decrease in riders and income would follow an increase in fare. Although admitting that the company was not receiving the full return on its valuation as fixed by the courts, the commission declared that "it is equally true that the year prior to the installation of the present rates the predecessor companies lost more than 10,000,000 revenue passengers with a rate schedule in effect similar to the rates now proposed."

Need Seen for Higher Fares in Twin Cities

The St. Paul City Railway has dropped the idea of getting a higher rate of fare in St. Paul, Minn., than in Minneapolis, but the management may be forced to apply to the Railroad and Warehouse Commission for a higher rate in both cities than the present 8-cent cash fare and six tokens for 40 cents; which vice-president T. J. McGill of the Twin City Rapid Transit Company says will be necessary "in fairness to our stockholders, unless there is a turn for the better." Mr. McGill said:

> Officials of the company have decided that the only practical plan is to keep the fares of the Twin Cities uniform. A higher fare in St. Paul than in Minneapolis would result in irreparable injury to St. Paul and it would necessarily hurt us. There will be no further effort to increase fares in St. Paul until we take the same action in regard to Minneapolis.

An action of this kind in regard to St. Paul has been taken already and is pending before the commission.

Revenue in both cities is below the return of 7½ per cent set by the commission as a proper amount.

Mr. McGill cited that railway fares in the two cities are 1 cent under the average for large cities, 200 of which now have 10-cent fares. The St. Paul City Railway and the Minneapolis Street Railway are controlled by the Twin City Rapid Transit Company.

Protest in St. Louis

United Railways accepts new fares with reservations on valuation, depreciation and rate of return

THE straight 8-cent fare for adult passengers which became effective on July 1 has been accepted by the St. Louis Public Service Company, but the railway has expressed dissatisfaction with the Public Service Commission's order granting the company a rate-base valuation of $63,500,000 and limiting the annual depreciation allowance to $800,000.

On June 28 the company presented two communications to the state commission at Jefferson City. One, filed by vice-president and General Manager Samuel W. Greenland accepted the 8-cent fare but insisted that the railway is worth at least $75,000,000 for rate-making purposes and also contended that the company is entitled to earn at least 8 per cent on such valuation instead of the 7.14 per cent rate stipulated by the commission.

The other communication was a formal motion for rehearing prepared by Louis H. Landus, general counsel for the company. It asked for the rehearing chiefly on the grounds that the $63,500,000 placed by the commission on the operating properties is inadequate to produce sufficient revenue to give a fair and proper return on the money invested in the properties. Mr. Landus characterized the finding as unlawful, unjust, unreasonable, against the law, against the evidence in that the fair value of the property is in excess of $75,000,000 and that the finding is confiscatory and deprives the St. Louis Public Service Company of its property without due process of law.

It is also alleged that the commission was in error in allowing a return of only 7.14 per cent. Another point raised is that the allowance of only 5 per cent for construction overhead is entirely too low. A further error claimed is the $4,700,000 valuation placed on the real estate holdings of the company—a figure which should be not less than $5,702,218. Further, it is pointed out the commission was in error in placing the cost of financing the company at less than $4,180,000, while the working capital allowance of $600,000, exclusive of materials and supplies, should have been not less than $986,808. The railway contends that the "going concern value" is $8,700,000 instead of the $3,000,000 allowed by the commission.

Another error, it is contended, is the commission's attitude that stress should not be put on either the original or reproduction cost of the properties in fixing the rate-base valuation. The company said reproduction cost is the proper basis for valuations.

Would Dismiss Piedmont & Northern Suit

The answer of the United States of America to the suit of the Piedmont & Northern Railway, involving the extension of the road's electric lines in the Carolinas, has just been filed at the office of the clerk of the United States Court for the Western District of South Carolina, at Greenville, S. C. The document asks that the suit of the Piedmont & Northern be dismissed, mainly on the grounds that the United States District Court lacks jurisdiction to hear the case.

The electric railway company entered suit against the government and the Interstate Commerce Commission in an effort to set aside and annul a ruling of the commission in which a petition of the railway to extend its lines was denied. In seeking to have the ruling annulled, the main contention of the road was that the Interstate Commerce Commission lacked authority to govern the road's actions and plans. The main allegation of the Piedmont & Northern is denied in the answer of the government in which dismissal of the action is prayed, the jurisdiction of the district court to hear the case being strongly contested.

Shortly after the Piedmont & Northern filed its suit against the government in Federal Court at Greenville, seven steam railroads sought to be made "parties defendant" with the government to the suit. The steam roads pointed out that they operated lines in North and South Carolina and charged that they were "directly and indirectly" affected by the proposal of the electric railway to extend its lines from Spartanburg, S. C., to Gastonia, N. C., and from Charlotte to Winston-Salem, N. C.

Hearing on preliminary questions in the suit of the electric railway, among them the intervention petition of the steam railroads, was set for June 28 before Judge Morris Sopher of Baltimore, at Asheville, N. C.

Situation in Hamilton Reviewed

At the hearing before the Ontario Railway and Municipal Board on June 12 the Hamilton Street Railway, Hamilton, Ont., produced much evidence to show that the system had been unprofitable for several years. The company is petitioning for a 10-cent fare on the cars and a 15-cent rate on the buses. After the hearing on the fare question is concluded the application of the men will be heard. They are seeking an increased wage of from 47 cents to 60 cents an hour.

A considerable part of the session on June 12 was consumed by the oral report of W. J. Hagenah, an American expert, who made an appraisal of the company's system in April. Glyn Osler, a railway representative at the hearing, said that the company found it impossible to continue to give service at a 5-cent fare, a rate most companies had discarded, meet expenses and provide a return of any consequence on the investment.

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$50,000 Authorized for St. Louis Survey

Mayor Victor J. Miller of St. Louis, Mo., on June 26 signed the bill authorizing the expenditure of $50,000 for a transit survey by a special commission. This measure was sponsored by Mayor Miller.

The commission will include the Mayor, city comptroller, presidents of the Board of Aldermen and Board of Public Service, the director of streets and sewers, one other Alderman, a member of the Missouri Public Service Commission and representatives of the City Plan Commission and the St. Louis Public Service Company and seven private citizens.

An outside engineer will probably be retained by the new commission to advise it on technical matters. Mayor Miller has asked C. E. Smith, vice-president of the New York, New Haven & Hartford Railroad and former consulting engineer for the city, to recommend an engineer for the place. The commission will begin functioning on July 26. Its personnel has not been selected.

Higher Wages Sought by Border Men

Platform men of the Hydro-Electric Railways, Windsor, Canada, have presented demands for a wage increase of 10 cents an hour to William R. Robertson, general superintendent. In addition to seeking a higher wage, the men are asking for operation of two-men cars on the two trunk lines and a week's vacation with salary.

Mr. Robertson told the committee which interviewed him that operation of two-men cars as requested would require the services of fourteen additional men with an increase of $28,000 in the annual payroll. He said that the application would be referred to the Hydro-Electric Commission at Toronto.

Same Privilege for Summer Students in Atlanta

An order has just been issued by the Georgia Public Service Commission directing the Georgia Power Company to sell street car tickets to children attending summer school on the same basis as those attending school during the regular nine months' term. Accordingly, children who present the proper certificates showing that they are bona-fide summer school students may secure tickets at the rate of 20 for $1.

No Change in Toledo Wage Issue

No agreement on a new wage contract between the street car men's union and the Community Traction Company, Toledo, Ohio, has been reached, despite the fact that the 1927 agreement expired on June 1. So far no concessions have been suggested by the company other than the extension of the last year's plan with a few minor changes. The men have not pressed their demand for an increase, but have been insistent on resumption of the two weeks' vacation with pay which was formerly a part of the contract.

Sept. 10 Fixed as Date for Washington Fare Hearings

As a result of the discussion of the petition for a fare increase presented by the Capital Traction Company, Washington, D. C., the Public Service Commission has arrived at two decisions. It has been decided definitely to omit the Washington Railway & Electric Company from consideration so far as permitting it to benefit from any increase granted the Capital Traction Company, and Sept. 10 has been tentatively set as the date for beginning the proposed hearings.

Reduced Fares on Northeast Oklahoma Line

A reduction of passenger fares, effective July 1, was announced on the lines of the Northeast Oklahoma Railroad through H. B. Cobban, general manager. A uniform fare of 10 cents between all points on the lines was made effective. The reduction does not apply to the buses. The Northeast Oklahoma Railroad operates electric interurban and bus lines in the lead and zinc mining districts of northeastern Oklahoma and southwestern Kansas. The company gave everyone an opportunity to ride free, one or more times, on its lines on June 30 and thousands availed themselves of the privilege.

Soft Seats Seduce Shekels

Cushions Commended to Car Companies as Cash Collectors; P. E. Plans Putting Profits into Pads for Patrons

SOFT seats not only turn away the wrath of street-car riders, but tend to convert more pedestrians into riders. Inasmuch as increased patronage makes for more revenue, the admission was made today as an item of information to members of the California Electric Railway Association in convention at the Cliff Hotel, San Francisco. Its purveyor was A. W. Brohman, transportation superintendent for the Market Street Railway of San Francisco.

He said that the company suffered a decrease in total revenue last month, but that on lines where cushion seats are in use, the earnings mounted. He followed his statement with the prediction that within a few years all California electric lines will come to the soft-seat era.—From account of meeting of California Street Railway Association in Los Angeles *Times*.

Columbia Property Not to Be Sold

The transportation situation in Columbia, S. C., has recently taken a new turn. Circuit Judge W. H. Townsend of Columbia has issued a permanent injunction enjoining the sheriff of the county in which Columbia is located from selling the property of the Columbia Railway, Gas & Electric Company under an execution to satisfy a judgment for $20,000. Records show that in 1924, C. H. Leitner instituted a suit against that company to recover damages suffered by him due to alleged negligence on the part of the railway. He was awarded a verdict of $20,000, which, on appeal, was upheld by the State Supreme Court. This judgment, it is claimed, has never been paid and an execution was issued thereon to the sheriff and the railway company furnished the sheriff with a list of property to be regarded as levied upon, which was especially street cars and street car tracks, and the sheriff advertised this property for sale in July, 1928.

The complaint on which the injunction order was issued sets forth that the "purpose and intent of the Broad River Company is to effect a complete transfer of all the property and franchises now claimed by the companies to be owned by the street car company and which are necessary for the operation of street railway service so that the liability of both companies to operate such service in Columbia . . . might be rendered nugatory, and to complicate, if possible, the proceedings in mandamus pending in the State Supreme Court, and to render inoperative any judgment which might be rendered therein" to require these companies to operate the street car system.

The story of the acquisition of the Columbia Railway, Gas & Electric Company by the Barstow interests and the subsequent moves relative to the separation of the different branches of the Railway, Gas & Electric Company is told in the complaint and it is alleged that the making of the railway an independent unit was in line with a plan not to render railway service.

This order by Judge Townsend follows close on the handing down of an opinion by the United States Circuit Court of Appeals, in the case of the Columbia Railway, Gas & Electric Company against the state of South Carolina, John M. Daniel, attorney general, and the city of Columbia, in which the company appealed from the ruling of the district court of the United States for the eastern district of South Carolina.

This opinion was to the effect that the electric railway was not entitled to the benefits of the bankruptcy act—that it could not go into bankruptcy.

Recently a referee completed the taking of testimony on the mandamus proceedings instituted to compel the company to restore service in Columbia. The findings of the referee, appointed by the Supreme Court, have not yet been submitted to the court. Railway service was discontinued in Columbia in March, 1927.

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Recent Bus Developments

Staten Island Bus Rights Protested

The Richmond Railways, operating six lines on Staten Island, has started court proceedings to annul the certificate of convenience and necessity awarded by the Transit Commission to the Tompkins Bus Corporation permitting it to operate eighteen bus lines on Staten Island. The railway contends that the proceedings were illegal and the certificate was issued on insufficient proof. Supreme Court Justice McGoldrick has ordered the Transit Commission to certify all its proceedings in the Supreme Court.

The petition alleges that the Tompkins Bus Corporation's application for a certificate permitting it to operate its bus lines was granted on May 16 last, and that on June 13 the commission denied an application by the Richmond Railways for a rehearing.

The railway asserts that the Tompkins Bus Corporation, organized in April, 1925, without any authority began operating bus routes in competition with the trolleys, charging at first 5-cent and later 10-cent fare. The company also alleges that the certificate granted to the bus company is void because twelve votes were required from the Board of Estimate in granting the company a charter.

The petition charges further that eleven of the eighteen routes approved for the Tompkins company in many instances are on the same streets as the plaintiff's trolley line, and in other cases parallel the Staten Island Rapid Transit tracks, and that the competition of the bus company will injure the other transportation companies to the extent that the earnings will be insufficient to support their operation "to the consequent injury of the public." The financial incompetency of the bus carrier also is charged.

Fewer Bus Passengers in Kansas City

At the end of the first two weeks under the new trial bus franchise the Kansas City Public Service Company reports that with a 15-cent fare trunk-line buses took in $3,924 less and hauled 70,475 fewer passengers than in the similar period last year. The weather conditions account for some of the decline, but the decline on the trunk lines is said to be greater than the company anticipated.

There was a decrease in patronage and revenue on every line except the Broadway-55th buses, which replaced the 25-cent express line. On this line both the number of passengers hauled and the revenue increased. The total number of passengers hauled during the first two weeks of June this year was 171,193 compared with 241,688 last year. The revenue this year was $19,516 compared with $23,440 last year.

New Service Planned for Lookout Mountain

The Tennessee Electric Power Company has notified the Board of Commissioners of Lookout Mountain that it will replace the present electric railway line on top of the mountain with buses. Two buses will be placed in operation for the initial service. The company contends that it has been losing about $10,000 a year on the mountain line. In addition to following a schedule over the important mountain streets on an hourly basis, several trips a day will be made to the new hotel by the buses.

New Route Mapped Out by Holyoke Company

A franchise has been granted the Holyoke Street Railway to operate a bus line between Mount Tom Junction and Easthampton, Mass. The railway is negotiating for the purchase of a 29-passenger bus which will make hourly trips from each point. This service is planned in place of the regular railway service. It is expected the change will be instituted about July 15.

Issues Ruling on Bus Applications in Iowa

In considering appeals from decisions of the State Railroad Commission affecting application for bus lines, district courts of Iowa have no right to review questions of fact affecting the discretionary powers of the commission, but must base their decision solely upon questions of law involved. The Iowa Supreme Court so ruled recently in reversing the Cerro Gordo County District Court. The case involved the petition of the Waterloo, Cedar Falls & Northern Railway for a permit to operate a bus line paralleling, in part, the route of the Red Ball Transportation Company of Mason City between Waterloo and Mason City. The Supreme Court ordered that a certificate be issued.

Where to Go and How!

The Florida Motor Lines, a Stone & Webster subsidiary, has announced summer excursion trips to Asheville, N. C., with round-trip rates including hotels and expenses of side trips in the mountains. Trips will take ten days. The excursion buses will leave Tampa and Orlando.

New Line Authorized in Lackawanna

John F. Burke, receiver of the Hamburg Railway, has been authorized by the New York Public Service Commission, to operate a bus line from the Hamburg Turnpike to South Park Avenue in Lackawanna, N. Y. This line will form a connecting link with another line now operated by the receiver in that city. The extended route will provide belt-line service in Lackawanna.

Bus Rights Sought in Burlington

Further testimony will be taken on July 24 by the Public Service Commission of Vermont on the application of the Burlington Rapid Transit Company to operate buses over a loop route from the City Hall to Lakeside and return. At present the company is operating buses under a so-called hack license at Ethan Allen Park, the plant of the American Woolen Company, and on the Lime Kiln Road.

William S. Appleyard, president of the company, believes that for the type of service intended to be furnished the buses would be preferable to trolley cars. He announced his willingness to take over the service now being given in this part of the city by the Burlington Traction Company, but to do so by giving service with buses. As an earnest of good faith the people of Burlington were invited by the company to ride free in a new Twin Coach.

The company's plea is being opposed by the Burlington Traction Company, a subsidiary of the People's Light & Power Corporation. As it appears now the situation stands about as follows: The Public Service Commission wants more evidence on the score of the convenience and necessity of the new service; Mayor Girard of Winooski and City Attorney Hopkins of Burlington are against the elimination of the trolleys; the railway says no more money will be spent on improvements until the attitude of the commission is known toward further bus competition, but that the company will put the railway in good order if the bus petition is denied. Edward J. Neary of Griffin, Sherwood & Neary, Inc., New York, consulting engineers, testifies the railway is in poor physical condition.

Buses Replace Cars on Pennsylvania Line

The last trolley was run over the tracks of the Media-Glen Riddle division of the Southern Pennsylvania Traction Company on July 1 and operation of buses from Chester to Media and thence to Glen Riddle began.

Permission to abandon was authorized several days ago by the Public Service Commission. Tracks will soon be removed.

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Financial and Corporate

New Company for Phillips Holdings

The Rochester Empire Power Corporation has been incorporated in Albany with a capital of 200,000 shares of $100 par preferred stock and 1,600,000 shares of no par common stock as a sequel to the recent purchase of the Mohawk Valley Company and the New York State Railways from the New York Central Railroad by E. L. Phillips and his associates.

The Rochester Gas & Electric Corporation, leading subsidiary of Mohawk Valley Company, together with the New York Central Electric Corporation, the Empire Gas & Electric Company, and the Elmira Water, Light & Railroad Company, subsidiaries of the Empire Power Corporation, which Mr. Phillips has controlled several years, will be consolidated in the Rochester Empire Power Corporation. The Long Island Lighting System, Mr. Phillip's first utility property, and the New York State Railways, will continue to operate independently.

The four properties to be combined in the new corporation have total assets of $105,792,761, and their gross earnings in 1927 aggregated $19,523,052. They furnish electricity in Rochester, Canadaigua, Geneva, Cayuga, Seneca, Elmira, Corning, and numerous other towns and villages, as well as extensive gas services, transportation by trolley and bus and steam-heating plants in the territory served.

Sale Date of St. Paul Southern Fixed

Sale of the St. Paul Southern Railway, an electric line operating between Hastings, Minn., and St. Paul, has been ordered by the District Court of Dakota County on July 16. The order by Judge W. A. Schultz followed petition by Receiver C. B. Kuckler of Hastings. The company owns the right-of-way from Hastings to Inver Grove, a suburb of south St. Paul. Albert T. Clark, Minneapolis, has made an offer for the line, which has been in receivership since 1918.

Missouri Pacific After Port Arthur Line

It is reported that the Missouri Pacific Railroad has decided to exercise an option which it obtained some time ago to purchase the electric railway of the Eastern Texas Electric Company, running over the 25 miles between Port Arthur and Beaumont. The line intersects the Gulf Coast branch of the Missouri Pacific at Beaumont and would afford the latter an opportunity for constructing deep-water terminals at or near Port Arthur. The steam road will operate the new acquisition principally as a freight carrier, since the passenger traffic can be taken care of by a line of buses which the Eastern Texas Electric Company already has in operation between Beaumont and Port Arthur.

Small Increases in Gross in Baltimore Under New Rates

An increase of $27,405 in gross earnings during May, compared with the corresponding month of last year, is reported by the United Railways & Electric Company, Baltimore, Md. This increase reflects the 8½-cent fare. It was brought about in spite of a decrease of 1,450,029, or 7.63 per cent, in passengers.

On account of increased operating expenses, including higher wages, the company did not show an improvement in net income. This decline was only 2.82 per cent, however, the figures being $61,738, compared with $63,529.

Charles D. Emmons, president of the United, says that while the increased fare evidenced itself in the May gross receipts the increased gross earnings since the new rate of fare went into effect have been at a rate $400,000 less than that estimated by the Public Service Commission, as necessary in the public interest.

COMPARISON OF EARNINGS OF UNITED RAILWAY, BALTIMORE, UNDER NEW FARES

	May, 1928	May, 1927
Passenger revenue	$1,412,390	$1,384,527
Other revenue	18,037	18,494
Total	$1,430,428	$1,403,022
Operating expenses:		
Way and structures	$80,622	$76,205
Equipment	77,445	75,368
Power	120,900	117,501
Cond. trans.	452,381	446,126
Traffic	16,320	13,173
General and miscellaneous	139,671	129,145
	*712	*1800
	$886,629	$855,917
Depreciation	71,521	70,151
Total	$958,151	$926,068
Net operating revenue	$472,277	$476,954
Taxes	140,134	130,512
Operating income	$332,142	$337,441
Non-operating income	11,802	15,583
Gross income	$343,945	$353,024
Fixed charges	235,540	242,828
Remainder	$108,404	$110,196
Interest on income bonds	46.666	46.666
Net income	$61,738	$63,529
Car-miles	2,889,685	2,955,174
Seat-miles	136,645,673	137,966,468
Revenue passengers	17,551,521	19,001,550
Transfer passengers	7,435,526	7,932,791
Revenue passengers per car-mile	6.0798	6.4380
Maintenance cost per car-mile	0.0565	0.0523
Depreciation cost per car-mile	0.0248	0.0237

*Credit

Audit Ordered at Detroit

An audit of the books of the department of street railways at Detroit, Mich., has been ordered by the Street Railway Commission. For several years this firm has audited the books of the system, and in each instance the figures arrived at have differed from those of the department auditor.

Commissioner John Gorman stated that it would be necessary for the commission to set some definite rule relative to depreciation if any benefit was to be derived from the audit by an independent firm. In the past, the Price-Waterhouse figures have not corresponded with those of the system's own auditor largely due to different methods of fixing depreciation.

Short Abandonment in Cortland

The Public Service Commission on July 2 authorized abandonment by the Cortland County Traction Company of about 500 ft. of its system in Cortland, N. Y. Only one car has been operated over the tracks making connection with the Lackawanna Railroad's passenger trains. Another line runs within 500 ft. of the station. The railway applied for leave to abandon at the request of the Cortland authorities.

Memphis Interurban Removed

Removal of the rails is now about complete on the tracks of the Memphis & Lake View Traction Company. This 11-mile line extending from Memphis, Tenn., to Lake View, Miss., was abandoned on May 1. Approximately 1,000 tons of rail will be removed. One hundred tons of this rail have been sold, leaving 900 tons for further sale. All the copper has been sold.

Outstanding bonds totaling about $75,000, half of the company's capitalization, will be taken up in full on Nov. 1. Holders of these bonds who desire to liquidate before that date can redeem them.

The company was founded in 1911 when Lake View appeared to be the coming suburban resort. In 1912 the company was reorganized, a group of bondholders taking over the line. At the request of the reorganized company the Memphis Street Railway then purchased the line, issuing $150,000 of bonds to replace the earlier securities.

Loss on Northern States Railway Lines

Railway gross revenue of the Northern States Power Company and subsidiaries for the year ended Dec. 31, 1927, was $268,370 compared with $268,705 a year ago. Net earnings of the railway department showed a loss in 1927 of $34,599 compared with a loss in 1926 of $30,654. The company serves Fargo, N. D., and Moorhead, Dilworth, and St. Cloud, Minn., with electric railway transportation.

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Traffic Decrease in Oakland

General business conditions affect passenger traffic and earnings on Key System Transit. Passenger revenue totaled $7,306,392. Operating expenses increased $468,559

DURING the year 1927, 788,177 passenger car miles of service was eliminated by the Key System Transit Company, Oakland, Cal., and bus service increased 344,307 bus miles, but the saving in operating expenses, as a result of this net decrease in service, was totally absorbed by an increase in the average hourly rate of wages paid platform men. This was reported in the annual statement of the company for the year ended Dec. 31, 1927.

Revenue passengers on the street car division were fewer by 2,717,121 passengers during 1927 compared with 1926, which, added to the decrease of 547,006 in transfer passengers, made a decrease of 3,264,127 passengers on the Street Car Division. All classes of passengers on the Street Car Division decreased with the exception of the 3½c. school children's fares, which showed an increase of 154,515. The largest decrease in the number of passengers occurred in the 7-cent fares which amounted to 2,730,448. The passengers carried on the Transbay Division increased 328,850 during 1927 compared with 1926. Total revenue passengers on the entire system decreased 2,399,271, which is 2.75 per cent less than the previous year. This decrease was due largely to general business conditions, and increased use of the privately owned automobile.

The passenger revenue for 1927 was $7,306,392, compared with $7,447,397 for 1926. Total operating revenues decreased $144,762, from $7,597,584 for 1926 to $7,452,821 for 1927. Operating expenses increased $468,559, which was due largely to increased maintenance charges and reduced construction work. Sufficient service was eliminated to offset the increase in the average rate of wages paid platform men, and in addition, to show a small reduction in the conducting transportation costs for the year 1927 compared with the previous year. Taxes decreased $42,111, the result of decreased revenue. The increase of depreciation of $42,000 is the result of installing additional property.

Future Outlook Uncertain

The interest on bonds and funded debt for the year was $1,153,992. This is an increase of $176,616 over 1926. In addition to the interest charge of $1,153,992 there was a serial maturity on the equipment note issue of $175,000 and sinking fund installments of $34,935—making the total fixed charges for the year $1,363,927. The operations for the year resulted in a deficit of $579,017.

Twelve bus lines were operating at the end of 1927, and, even though every line showed an operating loss, there have been demands for extensions of bus service. The net loss from bus operation for 1927 was $206,305.

President Lundberg said the earnings for 1927 were totally unsatisfactory, both from the standpoint of the stockholders and bondholders. The bondholders had received their interest up to date, but it had only been made possible by the adoption of drastic measures.

Net additions to the property completed and put into operation involved an expenditure for 1927 of $1,722,320, making a total of new work completed for four years beginning with 1924, $4,289,072. In addition to this amount there was in progress $3,146,822 of work not completed at the end of the year 1927, of which the estimated amount of additions is $2,840,000, making total net additions for the four years $7,129,072.

One street car division passenger car No. 899 was constructed at the company's shops and put in service. Fourteen Fageol 28-passenger buses and one single-deck street car type 40-passenger Fageol Twin Coach were purchased and put into service. Additions were made to other equipment.

INCOME ACCOUNT OF THE KEY SYSTEM TRANSIT COMPANY FOR THE YEAR ENDED DEC. 31, 1927

Gross operating revenue		$7,452,821
Operating expenses:		
Way and structure (maintenance)	$544,061	
Equipment (maintenance)	558,375	
Power (maintenance and operation)	722,113	
Conducting transportation	3,231,505	
Traffic expenses	5,171	
General and miscellaneous	845,971	
Transportation for investment and construction overhead (credit)	54,648	5,852,550
Net operating revenue		$6,400,271
Less taxes		132,335
Operating income		1,167,936
*Add non-operating income		146,453
Gross profit		1,314,389
Sundry Charges:		
Depreciation	733,576	
Amortization of franchises	8,762	
Abandonment of obsolete equipment	11,698	754,036
Balance—current operations		560,352
Deductions:		
Bond interest	1,078,250	
Other interest	46,022	
Miscellaneous	29,719	1,153,992
Deficit—current operations		593,640
Profit and loss adjustments (credit)		14,623
Deficit for year 1927		579,017
Surplus from prior year	277,083	
Less dividend, for last quarter of 1926, on prior preferred stock paid Feb. 15, 1927	103,411	173,672
Final deficit		$405,345

*Includes $116,859 net revenue, Key System Service Company.

COST AND REVENUES FROM KEY SYSTEM BUS OPERATIONS

	1924	1925	1926	1927
Bus miles	340,479	850,111	960,835	1,305,142
Receipts	$24,145	$82,076	$114,503	$201,823
Total cost	$80,601	$206,315	$288,672	$408,128
Net loss	$56,456	$124,238	$174,169	$206,305
Receipts bus-mile (cents)	0.0709	0.0965	.....	0.1546
Cost bus-mile (cents)	0.2367	0.2426	.....	0.3127
Loss bus-mile (cents)	0.1658	0.1461	.....	0.1581
Passengers carried	703,641	2,261,739	2,808,115	2,968,265
Loss per passenger (cents)	0.0802	0.0549	.....	0.0695

MISCELLANEOUS STATISTICS OF THE KEY SYSTEM TRANSIT COMPANY FOR THE YEAR ENDED DEC. 31, 1927

Passengers carried:		
Street car division:		
Cash and ticket fares—7 cents		64,300,070
School tickets—3½ cents		2,322,706
Commuters (East Bay Cities)		712,826
Miscellaneous—14 cents and 21		695,949
Total revenue passengers		68,031,552
Free transfer passengers		19,892,829
Total revenue and transfer passengers		87,924,381
Transbay Division:		
21 cent Transbay fares	7,396,651	
Commuters—Transbay	8,227,823	
10 cent children's fares	157,407	
S. F. Sacto. R. R. Co. tickets	201,517	
Miscellaneous Transbay tickets	61,937	
Total Transbay passengers		16,045,335
7 cent fares (East Bay cities)	471,157	
3½ cent school tickets	48,469	
Total passengers (East Bay cities)		519,626
Total revenue passengers—Transbay Division		16,564,961
Entire System:		
Revenue spassengers		84,596,513
Revenue and free transfer passengers		104,489,342
* * * * *		
Average fare—revenue and transfer passengers—street car division, cents		5.29
Average fare—revenue passengers—Transbay, cents		15.69
Average number of passengers per day—street car division		240,889
Average number of passengers per day—Transbay		43,960
* * * * *		
Car mileage:		
Passenger car mileage	17,276,057	
Freight car mileage	33,531	17,309,588
Car-hours:		
Passenger car-hours	1,644,776	
Freight car-hours	6,828	1,651,604
Ferry boat mileage		109,984
Motor coach mileage		1,305,142
Rolling and Flotating Equipment Owned:		
Passengers cars	517	
Motor coaches	48	
Work cars	102	
Tool cars and wreckers	3	
Electric locomotives	3	
Ferry boats	7	
Miles of track owned		261.76
Miles of track operated under lease		2.22
Total miles of track operated		263.98
Miles of bus lines operated (round trip distance)		62.95

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Sale of Detroit United Likely Soon

More than 90 per cent of the outstanding Detroit United Railway first mortgage and collateral trust bonds and Detroit, Monroe & Toledo Short Line Railway first mortgage bonds have now been deposited under the Detroit United Railway reorganization plan.

The reorganization committee has not extended the time for deposit, but both issues are still being received on deposit under the plan by Central Union Trust Company, New York, pending receipt of instruction from the committee to refuse to accept additional deposits. It is expected that the decree of sale will be entered soon.

Abandonment in Buffalo 2 1/3 Miles

The Public Service Commission on July 2 approved a petition of the International Railway in which the railway asked permission to abandon certain parts of its existing system in Buffalo covering 2⅓ miles. Service is not now being given over the tracks. No opposition was voiced at a hearing before Commissioner Pooley.

Interstate Reports 1927 Activities

An achievement of the year 1927 was an arrangement by which interchange of freight traffic with the steam railroads was extended. This fact was mentioned in the report of the Interstate Public Service Company, Indianapolis, Ind., for the year ended Dec. 31, 1927. Through rates and working agreements were made which enabled the electric railway to ship and receive freight to and from 199 additional cities and towns in the Central Freight Association territory.

Six new all-steel passenger cars, equipped for multiple operation, were placed in service connecting New Albany, Jeffersonville and Louisville. These cars are the latest type of development and design, attractive in appearance, and have comfortable riding qualities. Four one-man Birney cars were added and placed in service in New Albany city lines. The parlor-buffet and sleeping car service between Indianapolis and Louisville created additional business.

More than 3,000 feet of track in New Albany were relaid with modern heavy-weight girder rail placed in concrete. An extensive amount of ballast has been used in track construction.

Bus service has been extended so as to cover the entire territory between Indianapolis and Louisville. An additional route was opened between Southport and Indianapolis.

During the year 30 additional electric warning signals were installed at road crossings. Air whistles on interurban cars were replaced with high-pitch electric horns which can be heard at greater distances and give effective warning.

The earnings of the railway lines of the company are not shown separately from those of the rest of the system.

$16,638 Surplus on Baltimore Interurban

For the year ended Dec. 31, 1927, the surplus of the Washington, Baltimore & Annapolis Electric Railroad was $16,638. The report follows:

YEAR ENDED DEC. 31, 1927		
Operating revenue		$2,601,365
Operating expenses including depreciation		1,915,684
Net operating revenue		$685,681
Taxes		131,882
Operating income		$553,799
Non-operating income		19,190
Gross income		$572,989
Deductions from gross income:		
Interest on bonds and notes	$535,804	
Miscellaneous deductions	20,547	
		556,351
Surplus for the year		$16,638
Surplus Account as of Dec. 31, 1927		
Surplus at beginning of the year		$1,331,745
Surplus for the year		16,638
		$1,348,383
Net deductions from surplus		659,107
Surplus at close of the year		$689,275

One and one-half per cent of the gross operating revenue, railway lines, was credited to "Reserve for Injuries and Damages."

Amount credited for twelve months to Dec. 31, 1927	$30,312
Balance in account at Dec. 31, 1926	115,333
Total	$145,646
Expenses and indemnities	36,630
Balance in reserve account Dec. 31, 1927	$109,015

The disbursements in payment of accident claims, suits, judgments and other expenses were 1.81 per cent of the gross operating revenue, railway lines.

MILEAGE TABLE

	On N.B. & A.E.R.R. Tracks	On Tracks Operated under Contract
Miles of single track	73.524	6.667
Miles of second track	40.934	6.667
Miles of sidings and turnouts	19.3598	.....
	133.8178	13.334

Traffic, Fare and Wage Figures

The number of revenue passengers, including bus passengers, reported by 215 companies to the American Electric Railway Association for May, 1928, compared with May, 1927, is as follows:

May, 1928	828,347,231
May, 1927	832,301,137
Decrease, per cent	0.48

The percentage decrease for May is the smallest which has occurred in any month this year. Since January, in fact, the percentage decrease each month under 1927 has steadily declined, indicating very gradual improvement in traffic. The only exception to this was the month of April, which showed a decrease of more than 3 per cent. This was due, however, to the fact that five Sundays were crowded into the month.

Average cash fares in cities of 25,000 population and over were

	Cents
June 1, 1928	8.1341
May 1, 1928	8.1186
June 1, 1927	7.9597

The rise in the average fare was due to increases in San Jose, Cal., and Sioux City, Iowa.

The average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Average Hourly Rate Cents	Index Number 1913 = 100 Per Cent
June 1, 1928	57.44	210.79
May 1, 1928	57.40	210.64
June 1, 1927	57.13	209.05

Detroit Receipts Decline

The balance in net income from operation of the Detroit Municipal Railway, Detroit, Mich., for the month of May was $34,928 after all interest and sinking fund charges or $31,377.92 below the net earnings for May, 1927.

On June 1 the system paid $500,000 as the semi-annual payment to the Detroit United Railway on the purchase contract. This brings the total amount paid by the city up to $6,000,000.

STATISTICS OF THE WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILROAD FOR THE YEAR ENDED DEC. 31, 1927

Car-Miles

Passenger (electric)	4,144,110
Auto motor coaches	6,754
Freight (electric)	263,754
Service (electric)	7,386
Total	4,422,004

Revenue Passengers Carried

1927	1926	1925	1924	1923	1922
*3,780,888	3,871,600	4,021,766	4,429,387	4,644,472	4,570,996

Electric cars	3,769,753
Auto motor coaches	11,135
	*3,780,888

Earnings

	1927	1926	1925	1924	1923	1922
Per car-mile	$0.4984	$0.4965	$0.5300	$0.5200	$0.5430	$0.5613
Per miles of track operated	$15,101	$15,237	$16,627	$17,763	$18,152	$18,248
Per mile of road	$27,485	$27,702	$30,185	$32,212	$32,916	$33,092
Per passenger	$0.4569	$0.4500	$0.4771	$0.4676	$0.4558	$0.4698
Per bus-mile	$0.2011	.....	.....	.....	.....	.....
Per passenger (bus)	$1.09	.....	.....	.....	.....	.....

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Legal Notes

CALIFORNIA—*City May Use Railway Depreciation Fund for Extensions.*

The city of San Francisco is permitted to use part of the so-called "depreciation fund" for its street railway system, to build extensions to that system. [Hunt vs. Boyle, 267 P., 97.]

FEDERAL CIRCUIT COURT—*Testimony of Superintendent That Motorman Denied That Accident Occurred Held Hearsay, and its Admission Prejudicial Error.*

In an action for injuries to a passenger alighting from a street car, the railway superintendent testified that he brought each motorman operating on that route between the hours during which the accident occurred to his office and led each one to believe that he thought he had such an accident; nevertheless each declared positively he had no such accident. This testimony was held to be hearsay, objectionable and prejudicial and sufficiently so that a new trial was granted. [Armborst vs. C. T. Co., 25 F. (2d) 240.]

FEDERAL SUPREME COURT—*Railroad Has Power to Grant Taxi Company Exclusive Privileges at Depot.*

A contract between a railroad and a taxi company allowed the latter exclusive privileges of sending agents on the railroad's trains, into its depots and on surrounding premises to solicit the transportation of passengers and baggage. This permission was held to be valid, in spite of the complaint of a rival taxi company. The case came under the federal courts because the privileges related to railway property in Louisville, Ky., while the taxicab company to which the privileges were granted was organized in Tennessee. [Black & White T Co. vs. Brown & Yellow T Co., 48 S. Ct., 404.]

FEDERAL SUPREME COURT—*Legality of Requirements on Interstate Buses Considered. Known Intent of Passenger Rather than Wording of Ticket Determines the Character of Commerce.*

A municipal ordinance requiring both intrastate and interstate bus operators entering a city to obtain liability insurance from insurance companies authorized to do business within the state and other non-discriminatory regulations for the purpose of insuring the public's safety and convenience are reasonable. The charge of a license or registration fee for all such buses no larger than is reasonably required to defray the expense of administering the regulations and providing a fair contribution to the cost of constructing and maintaining the highways may be made by a city or state. But such fees and contributions cannot be sustained as a police measure, and a flat tax substantial in amount and the same for buses plying the streets continuously in local service and for interstate buses making only a single trip daily cannot be sustained. An occupation tax from one engaged in both intrastate and interstate commerce can be assessed by the state, or may be delegated by the state to be exercised by a municipality, but the fee must be imposed solely on account of the intrastate business done. It must not be increased because of the interstate business, and one engaged exclusively in interstate commerce would not be subject to the tax. A bus carrier which required all passengers to purchase an interstate ticket but habitually made stops to permit any who so desired to ride only between two points in the same state was doing an intrastate business. The destination intended by the passenger when he begins his journey and known to the carrier determines the character of the commerce. [Sprout vs. City of South Bend, Ind. 48-S. Ct., 502.]

MASSACHUSETTS—*Railway Allowing Passengers to Make Part of Their Journey on Foot Must Warn Them of Special Dangers.*

Owing to the construction of a bridge, the cars on a city railway were stopped on one side of the bridge and passengers crossed on foot to continue their transportation on the other side. In such circumstances the railway should stop its cars at a safe place and warn the passengers of the danger of stepping into any holes which may be in their way during their walk. [McManus vs. B. E. R., 160 N.E., 529.]

NEW JERSEY—*Right to Use Highway Does Not Imply Paving Charge.*

By agreement with the governing body of Kearny, a street railway company in 1926 removed its poles and overhead wires from the streets but reserved the right of replacing them and resuming operation of its railway at any time in the future should it so determine. Subsequently, the street was repaved and the company was assessed for the cost of the paving between the tracks and for a distance of 18 in. outside. The remainder of the cost of paving was defrayed by the town at large. The court held that a mere right to use a highway in the future did not subject the company to assessment for paving. [P. S. Ry. vs. Town of Kearney, 140A., 275.]

NEW YORK—*Commission's Control Over Fares Extended to Lines Operated Under City Franchise.*

A railway company operated about 2½ miles of its 39½-mile system within a city on a franchise from the city specifying a rate of fare. On the rest of its system there was no question but that the Public Service Commission had control over fares. The right of the commission to increase fares over all parts of the system was upheld. [Fagal vs. P. S. Commission, et al., 227 N.Y.S., 18].

OHIO—*Convenience of the Public Only Justifiable Reason for Additional Motor Bus Service.*

The Public Utilities Commission granted permission to a motor bus company to change the leaving time of its buses from their terminals and to increase its service. The change was made over the protest of a competing carrier. Evidence indicated that the purpose of the change was entirely for the convenience of the company and that no public convenience required the change. The action of the commission was reversed by the Supreme Court. [Lake Shore E. R. Co., vs. P. U. Comm., 160 N.E., 685.]

OHIO—*While on a City Street the Motorman Must Keep a Constant Lookout for Persons on the Track.*

A boy was hit by an automobile on a city street, and while in an unconscious condition was thrown on the track in front of an oncoming street car and was injured by the latter. He was held not to be a trespasser, although the track was on an unpaved side of the street. The railway was held responsible for the injuries it caused to him. [Ohio Valley E. R. vs. Payne, 3 S.W. (2d), 223.]

OHIO—*Negligence per se for Automobile to Drive on Left Side of Road.*

An automobile while being driven on the left side of the road early in the morning of a December day was struck by a trolley car going in the opposite direction. The action of the automobile driver in being on the wrong side of the road was held negligence per se. [Cleveland Ry. vs. Kuncic, 160 N.E., 734.]

PENNSYLVANIA—*Workmen Struck by a Car While They Were Unloading Planks.*

Workmen who were unloading planks from a wagon and observed a street car approaching but swung a plank around so that it protruded in front of a car at the instant the latter arrived and were injured were held guilty of contributory negligence. [Haskin vs. P. R. T. Co., 140 A., 547.]

WEST VIRGINIA—*Railroad's Consent to Crossing Tracks at Grade a Consideration.*

An agreement between a steam railroad and an electric railway provided that the latter should install a crossing over the tracks of the former and should keep the crossing in repair. After this had been done for some 25 years the electric railway brought suit to require the railroad to pay half the cost of maintenance. The court held, however, that the permission of the railroad to cross its tracks was a valid consideration for the street railway's agreement to install and maintain the crossing. [S., E. L. & B. V. Traction Co. vs. Pittsburgh, C. C. & St. L. R. Co., 142 S. E., 257.]

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Personal Items

Central Public Service Personnel

Review of careers of men in charge of railway properties formerly run by American Gas & Electric Company

RECENT railway acquisitions by the Central Public Service Corporation of Chicago, Ill., have brought to light the names of several officials who

W. B. Brady

are playing big parts in this organization's expansion program. Outstanding among these is William Burke Brady, vice-president in charge of the Central Public Service Corporation's electric railway properties. Others are C. B. Short, district manager Roanoke Railway & Electric Company; F. W. Samworth, district manager Ohio Valley Electric Railway, Huntington, W. Va.; C. T. Long, manager Portsmouth Public Service Company, Portsmouth, Ohio; D. C. Frost, manager Lynchburg Traction & Light Company, and M. T. Griffin of the Five-Mile Beach Electric Railway, Wildwood, N. J.

In Charge of Seven Subsidiaries

Early in his career Mr. Brady drifted away from the railway business and traveled extensively abroad. For some time now he has been back in charge of the several railway subsidiaries of the Central Public Service Corporation, including the Interstate Motor Transit Company and the Cannon Ball Transportation Company. Mr. Brady was born in Harrisburg, Pa. He attended Lehigh University, at Bethlehem, Pa., and Johns Hopkins University, at Baltimore. After college he began work in the line division of the Brooklyn Rapid Transit Company, spending several years with this company in various departments. He also served with the Westinghouse Company at East Pittsburgh and later became designing engineer for the Brown Hoisting Machinery Company. Still later he was affiliated with the National Carbon Company, with which he became superintendent in charge of production.

C. B. Short, manager at Roanoke, entered the employ of the Roanoke Railway & Electric Company as stenographer to the general manager in 1907. A few years later he was made claim agent. In 1917 he left the service of the company, but returned on Jan. 1, 1924, as assistant to the general manager. Two years later he was made assistant general manager and this position he occupied until the Central Public Service Corporation acquired the property early this year, at which time he was made manager.

D. C. Frost, manager at Lynchburg, Va., has been connected with the Lynchburg Electric Railway & Light Company since May 15, 1899. This company was then operating six cars and had a few lighting customers. In 1900 it was merged with the Lynchburg & Rivermont Street Railway under the name of the Lynchburg Traction & Light Company and Mr. Frost was retained as superintendent of the entire system. At that time the company operated twelve cars and the management of the railway fell to Mr. Frost. These two properties were held by various holding companies, the last one being the American Gas & Electric Company. On March 14 Mr. Frost was made manager of the railway properties in Lynchburg, which were still operated under the name of the Lynchburg Traction & Light Company. Since the American Gas & Electric Company sold to the Chicago Public Service Corporation the railway properties in Lynchburg early this year Mr. Frost has had entire charge of the Lynchburg Traction & Light Company in Lynchburg.

M. T. Griffin

C. T. Long, manager of the Portsmouth Public Service Company, Portsmouth, Ohio, entered the electric railway field in 1914 as valuation engineer for the American Railways, remaining in this position until 1917. For the next two years he served with the Engineers, U. S. A., and from 1919 to 1922 was engaged in valuation of electrical properties in Reading, Philadelphia, Grand Rapids and Mobile. He returned to the American Railways (afterward the American Electric Power Company) and in 1922 was in charge of the appraisal of the Consolidated Power & Light Company; the Ohio Valley Electric Railway, Boyd County Electric Company and later was appointed construction engineer at the Kenova Power Plant of the Consolidated Power & Light Company. He remained in this position after the purchase of the American Electric Power Company by the American Gas & Electric Company.

C. B. Short

After the purchase of the Portsmouth Public Service Company by the American Gas & Electric Company in 1925 he was transferred to that property as resident engineer and remained in that capacity until Dec. 30, 1927, when the property was taken over by the Central Public Service Company. On that date he was promoted to the position of district manager of the Portsmouth Public Service Company. Some months later his duties were extended to include the local management of the Cannon Ball Transportation Company and the Interstate Motor Transit Company.

Mr. Long was graduated from Lafayette College as civil engineer in 1900. For the next fourteen years he engaged in the location, construction and valuation of railroads.

Marion T. Griffin, manager of the Five-Mile Beach Electric Railway, Wildwood, N. J., began railway service with the Southern Pennsylvania Traction Company as pit man in 1916. He advanced in the mechanical department of that company to the position of foreman of the armature room. In 1921 he accepted the position of master mechanic of the Five-Mile Beach Electric Railway and two years later was promoted to the position of superintendent of the company. Early in the present year when the railway was sold by the American Gas & Electric Company to the Central Public Service Corporation, he was selected to manage the affairs of the railway.

Mr. Griffin was born in Maryland. June 30, 1895.

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The careers of Adam Gschwindt, who manages the Rockford properties, and of Fred Samworth, in charge of the Ohio Valley Electric Railway at Huntington, were reviewed in ELECTRIC RAILWAY JOURNAL, issues of May 5 and June 2 respectively.

C. A. Coons Appointed to Springfield Post

Charles A. Coons, formerly general superintendent of the United Traction Company, Albany, N. Y., and previous to that superintendent of transportation of the International Railway, Buffalo, has been appointed assistant general manager of the Springfield Traction Company, Springfield, Mo. Mr. Coons has spent his entire business career in the street railway field, beginning with the Buffalo Street Railway as a horse-car driver in 1890 and continuing through until he reached the office of superintendent of its successor, the International Railway.

The Springfield Traction Company operates upwards of 50 cars and 14 buses in a city of about 60,000 population.

Messrs. Coffield and Swift Promoted on Providence Property

Edward J. Coffield, formerly superintendent of the Woonsocket Division of the United Electric Railways of Rhode Island, assumed the duties of superintendent of the North Main Street division in Providence on July 1. He was promoted to the position to fill the vacancy caused by the death of F. H. Brown of Pawtucket. Entering the service of the United Electric Railways in 1907 as a conductor, Mr. Coffield successively became motorman, dispatcher, and inspector. He was appointed to the Woonsocket division in 1923. During the war he served in the army. Everett A. Swift, formerly an inspector in Providence, succeeds Mr. Coffield. Mr. Swift started with the company in 1904 as a motorman. In 1923 he was made inspector, serving on several lines. He has also been inspector at a bus terminal in Providence.

GOVERNOR JACKSON of Indiana, has reappointed Frank T. Singleton, Martinsville, Ind., to another four-year term as a member of the Indiana Public Service Commission. Mr. Singleton is expected to retain for the time being his post as chairman of the commission, in which capacity he has served the past year. Mr. Singleton was appointed to the commission on July 1, 1924, by Emmett F. Branch, then Governor. Mr. Branch was one of the many who recommended that Mr. Singleton be retained. For twenty years Mr. Singleton was a newspaper publisher of Martinsville. He served as secretary of the Indiana Republican Editorial Association for several years and long had been active in political and civic affairs of his community. He was postmaster at Martinsville.

Obituary

T. B. MacRae

Well-known accountant and participant in A.E.R.A. affairs—Entered railway field forty-six years ago

With his term of service as president of the Accountants' Association of the A.E.R.A. not yet completed T. B. MacRae, auditor of the Chicago Rapid Transit Company and well known throughout the industry, died on July 3. Mr. MacRae has been identified with the railway interests since 1882.

In the mid-western section of the country Mr. MacRae got his start, and in that locality he was to distinguish himself as one of the foremost accountants in the electric railway industry. He began his railroad career with the Chicago & Northwestern Rail-

T. B. MacRae

road in the freight office in Cedar Rapids, Iowa. After three years there he entered the freight auditor's office of the Burlington, Cedar Rapids & Northern Railroad. His talents were soon discovered and he later was appointed traveling auditor and, still later, chief accountant in the general auditor's office. It was his lot to close the books of the Burlington, Cedar Rapids & Northern Railroad when that property was taken over in 1902 by the Chicago, Rock Island & Pacific Railway. He remained with the Rock Island Lines three years, later being elected auditor of the Metropolitan West Side Elevated Railroad.

The first real honor came to him in 1911 when the four elevated railroads operating in Chicago were brought under a unified management and Mr. MacRae was elected auditor of the individual companies. These four companies were consolidated on Jan. 1, 1924, under the corporate name of the Chicago Rapid Transit Company and he was elected auditor of the consolidated company. It was because of his varied experience in accounting practice and procedure that Mr. MacRae had long stood so high in the councils of the American Electric Railway Accountants' Association.

Mr. MacRae was born in Jackson, La. He was educated in private schools and at the United States Military Academy.

W. S. Whitney

W. S. Whitney, assistant general freight and passenger agent of the Union Traction Company of Indiana, died on June 21 in Muncie, Ind. Twenty-two years ago Mr. Whitney entered the traffic department of the Ohio Electric Railway, Cincinnati, Ohio, serving in the capacity of general freight agent and general passenger agent. After the reorganization of that property following receivership he remained with its successor, the Indiana, Columbus & Eastern Traction with headquarters in Springfield, Ohio. Prior to this connection he had been in steam railroad service, working in various capacities in the traffic and accounting departments. Mr. Whitney was president of the Central Electric Traffic Association in 1912-1913. He was 73 years old.

GEORGE S. BAXTER, a railroad contractor for many years, died on July 2. He constructed the foundations for the Second and Third Avenue elevated lines and built the New York Central's elevated structure on Park Avenue, New York City, north of 96th Street. Mr. Baxter became a cashier for the Northern Pacific Railroad in 1879, and remained in the railroad's employ for sixteen years, rising to the office of treasurer. He was born in New York in 1845 and was graduated from Williams College and from the Columbia University School of Engineering. For ten years following his graduation he did engineering work for mines and railroads.

CLYDE MARTIN, affiliated with the White company, died recently in Minneapolis. He was formerly associated with the Northern Ohio Power & Light Company, Akron, Ohio. Mr. Martin began as a trainman, was assistant claim agent and later was head of the securities department of the Ohio company.

JOHN B. THOMAS, identified with the Westinghouse Company for the last 52 years, died at Pittsburgh, Pa., recently. At the time of his death he was assigned to special duty with the company. Mr. Thomas entered the employ of the Westinghouse Company in February, 1876. In 1886 he was sent by George Westinghouse to Paris to manage the French branch of the air-brake company. He returned in 1888 and was transferred to the Westinghouse Electric & Manufacturing Company.

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Manufactures and the Markets

Detroit Orders 25 Buses

Twenty-five 40-passenger buses have been ordered by the Detroit Street Railways, Detroit, Mich., from the American Car & Foundry Company, Detroit.

Delivery will start in about three months. Bids were received and opened in February in response to a request by the commission, and the low bid was submitted by the Detroit concern of approximately $10,500 for each bus.

Whether the type of bus will be gasoline or gasoline-electric has not been definitely decided, that question being left open pending the recommendation of William B. Mayo, consulting engineer for the commission. The particular lines on which the buses will be put into operation have not yet been determined.

Tygarts Valley Traction Company Plans Improvements

Tygarts Valley Traction Company, Grafton, W. Va., plans improvements to cost several thousand dollars, including the extension of service to Blueville, a suburb. Plans and specifications for the extension have been completed and will be forwarded at once to the state road commission, which seeks to ascertain the location of tracks with relation to the route of the northwestern turnpike through the village. A 60-ft. highway there is fixed and possible condemnation proceedings will have to be taken to provide a right-of-way for the railway lines.

A.C.F. Fiscal Year Report

Report of American Car & Foundry Company and subsidiaries for year ended April 30, 1928, shows net income of $3,754,555 after charges, federal taxes, etc., equivalent after 7 per cent preferred dividends, to $2.75 a share earned on 600,000 shares of no-par common stock. This compares with $4,593,377 or $4.15 a share in preceding year. After payment of dividends there was a deficit of $1,945,445, against deficit of $1,106,623 in preceding year.

	1928	1927
*Profit	$6,590,056	$7,837,527
Rent, replacements, etc.	2,836,401	3,244,150
Net income	$3,754,555	$4,593,377
Preferred dividends	2,100,000	2,100,000
Common dividends	3,600,000	3,600,000
Deficit	$1,945,445	$1,106,623
Previous surplus	40,138,673	41,245,296
Total surplus	$38,193,228	$40,138,673
Taken from dividend reserve	1,945,445	.....
Profit and loss surplus	$40,138,673	$40,138,673

* After federal taxes.

Consolidated income account of American Car & Foundry Company, American Car & Foundry Securities Corporation and American Car & Foundry Export Company for year ended April 30, 1928, is shown in the accompanying table.

Tacoma Carhouses and Cars Destroyed

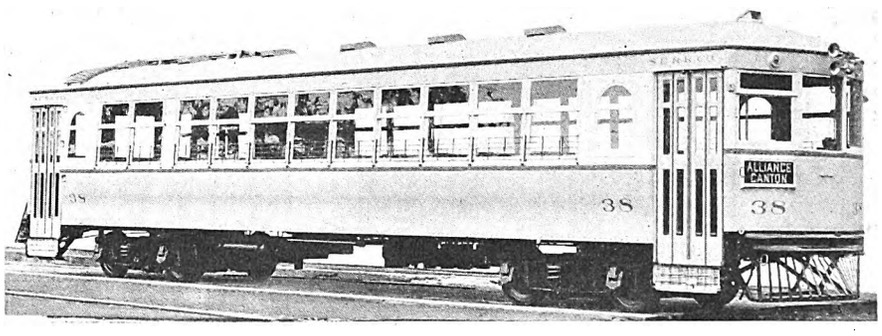
Recently a fire completely destroyed the newly constructed carhouses on the tideflats, and 21 street cars of the Tacoma Municipal-Belt Line, Tacoma, Wash., with damage estimated at $90,000. No replacement plans have as yet been announced.

Nineteen of the 21 cars were recently overhauled, and were ready to be re-

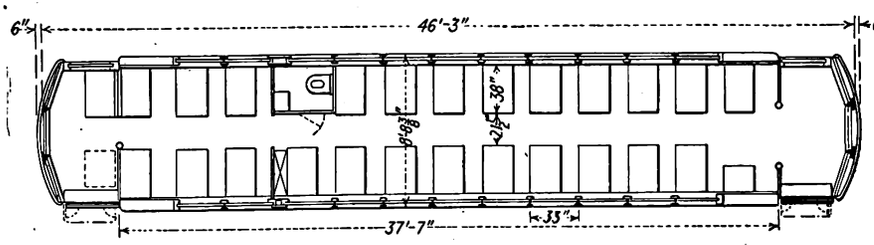
Alliance Cars Delivered

Three one-man interurban motor passenger cars were delivered May 22 to the Stark Electric Railroad, Alliance, Ohio, by the Cincinnati Car Company, Winton Place, Ohio. The cars were ordered on Feb. 6 as mentioned in the Feb. 18 issue of the JOURNAL. They are of the single end, double truck type and seat 52 passengers.

The cars are of semi-steel construction with arch roofs. They are 47 ft. 3 in. long, 8 ft. 8¾ in. wide and weigh 33,640 lb. The finish is in lacquer, the exterior cream and the interior trim in cherry. The seats in the main passenger compartment are full spring edge construction, canvas covered with removable linen covers. The smoker compartment seats are upholstered in gray Spanish leather. Other details may be found in the accompanying specifications:



One of the cars recently delivered to the Stark Electric Railroad



Plan of seating arrangement of Alliance cars

Weights: car body	16,170 lb.
Trucks	8,880 lb.
Equipment	8,590 lb.
Total	33,640 lb.
Bolster centers	27 ft. 7 in.
Length over all	47 ft. 3 in.
Length over body posts	37 ft. 7 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8¾ in.
Height, rail to trolley base	10 ft. 10 11/16 in.
Window post spacing	33 in.
Body	Semi-steel
Roof	Arch
Doors	End, folding
Air brakes	General Electric single end with safety feature
Armature bearings	Plain
Axles	Bethlehem hammered open-hearth
Car signal system	Faraday
Compressors	General Electric CP-27
Conduit	Flexible
Control	K-35-JJ with DB line breakers
Curtain fixtures	National Lock Washer
Curtain material	Double-faced Pantasote
Destination signs	Perforated sheet metal
Door mechanism	National Pneumatic
Fare boxes	Cleveland No. 9
Finish	Duco
Floor covering	Linoleum under seats
Gears and pinions	General Electric heat treated
Glass	Plate
Hand brakes	Cincinnati aluminum vertical wheel
Heaters	Consolidated
Headlights	Electric Service Supplies Company T-1419
Headlining	¼-in. Agasote
Interior trim	Cherry
Journal bearings	Plain
Journal boxes	Cincinnati cast steel
Lamp fixtures	Overbaugh-Ayers reflector, Bryant shade holder
Motors	Four GE 265, outside hung
Painting scheme	Cream
Roof material	Wood, canvas covered
Sash fixtures	Dayton Manufacturing Company
Seats	Hale-Kilburn Company
Seat spacing	33 in.
Slack adjusters	Cincinnati turnbuckle type
Steps	Folding
Step treads	Cast aluminum.
Trolley retrievers	Ohio Brass No. 13120
Trolley base	U. S.
Trolley wheels	Bayonet
Trucks	Cincinnati passenger type arch bar
Ventilators	Nichols-Lintern type C
Wheels, type	Rolled steel, 28 in. diameter
Pilot	Steel

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painted. Of the entire belt line system only two cars were saved.

Until arrangements are made to replace the cars, the city will use the Tacoma Railway & Power Company's cars. The city's substation near the carhouse was also damaged to the extent of several thousand dollars.

$60,009 for Old Railway Equipment in New York

Metal dealers and representatives of electric railway equipment firms were among bidders at an auction sale conducted recently by the Department of Plant and Structures of New York City, to dispose of equipment of the discontinued Staten Island trackless trolleys and the Staten Island Midland Railway. Commissioner Goldman announced total receipts of $60,009.

Poles and wiring of the trackless system brought a high bid of $44,100 from the Allite Corporation of 654 Broadway, New York City. The Century Metal Company was a high bidder with $4,400 on 33,968 lb. of copper wire.

Among other high bidders were: G. T. Abel, $2,500 for substation equipment; S. Simon, $2,672 for motors, wire and scrap metal; P. Griffiths, $2,350 for old wire; and D. Groscia, $1,555 for scrap iron and old rails.

Would Register Bidders on State Work

A standard registration act for the handling of records in connection with public construction work is being drafted by the Associated General Contractors and will be submitted to the legislatures of the various states. Under the terms of the proposed bill all persons bidding on state work would be registered. It would be the duty of the board administering the act to investigate the previous work done by the bidder. In the case of default the name of the contractor would be dropped from the registration list for a period of two years. In connection with the proposed legislation the general contractors will recommend that the members of the registration board be chosen from the ranks of experienced engineers and architects of such standing in the community as to be above political influence. The proposed legislation is an effort to eliminate the irresponsible and unscrupulous contractors from those who may bid on public works.

Meagher Heads Springfield Purchasing Agents

J. B. Meagher, purchasing agent of the Indiana, Columbus & Eastern Traction Company, has been elected president of the Springfield Purchasing Agents' Association, Springfield, Ohio. Mr. Meagher succeeds G. R. Muzzy. Other officers elected are Vice-president, P. J. Schneider; secretary, H. C. Laybourne; treasurer, C. C. Bishop; national director, G. R. Muzzy, and local director, H. A. Legge.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINER

Metals—New York	July 3, 1928
Copper electrolytic, cents per lb	14.525
Copper wires, cents per lb	16.625
Lead, cents per lb	6.30
Zinc, cents per lb	6.55
Tin, Straits, cents per lb	46.125
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, .o.b. vessel, Hampton Roads, gross tons	4.175
Somerset mine run, f.o.b. mines, net ons	1.8
Pittsburgh mine run, Pittsburgh, net tons	1.8
Franklin, Ill., screenings, Chicago, net tons	1.625
Central, Ill., screenings, Chicago, net tons	1.5
Kansas screenings, Kansas City, net tons	2.35
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	5.3
Weather rppf wire base, N.Y., cents per lb.	17.125
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bb lots) N. Y., cents per lb.	10.5
White lead in oil (100-lb. keg), N. Y., cents per lb	13.75
Turpentine (bbl. lots), N. Y., per gal	$0.615

Duty on Brick Imports Asked

Importation last year of 110,000,000 brick at the port of New York alone, has aroused the domestic industry which is demanding relief in the form of a duty on imports. At present building brick is on the free list. Protests which have reached Washington have been answered to the effect that a revision of the tariff must be awaited before an effort can be made to secure the relief asked. While the President may increase or lower the rates of duty, he is given no authority over the free list, under the flexible provisions of the act.

TRACK AND LINE

Seattle Board of Public Track and Line, Seattle, Wash., has awarded a contract to John A. Roebling's Sons' Company to furnish 10 miles of 00 hard-drawn trolley wire at $17.35 per hundred.

Chicago Rapid Transit Company, Chicago, Ill., will elevate its tracks in the city of Evanston, from Clark to Isabella Streets, a distance of about 1½ miles. This will complete the elevation through the entire city of Evanston.

Detroit Street Railways, Detroit, Mich., on July 7 put into operation its new car line from Michigan and Wyoming Avenues to the Fordson plant of the Ford Motor Company.

Holyoke Street Railway, Holyoke, Mass., is building 1 mile of new macadam road to afford a better entrance for motorists into Mountain Park.

Northern Ohio Power & Light Company, Akron, Ohio, is installing double track on Cornell Street in Barberton.

TRADE NOTES

Gunite Corporation, Rockford, Ill., has appointed A. N. Willsie, formerly with the Locomotive Stoker Company, in charge of railway sales.

English Electric Company of Canada, Ltd., is proposing a rearrangement of its capital structure with a view to placing itself in a stronger financial position and relieving itself of dividend arrears on preferred stock as well as reducing the fixed charges imposed by the preferred dividend rate of 8 per cent. Instead of existing preferred and common stock, the proposed plan provided for class A and class B shares. For each share of preferred stock, a holder will receive two shares of the new A stock and one-half of the new B stock. For every share of common, a holder will receive one share of the new B stock. The A stock, according to the plan, will be placed on a $3 per annum dividend basis immediately.

Motor Wheel Corporation, Lansing, Mich., is adding a $100,000 addition to its pressed steel plant.

Chisholm-Moore Manufacturing Company, Cleveland, Ohio, recently purchased by the Columbus McKinnon Chain Company, Tonawanda, N. Y., will hereafter be known as Chisholm-Moore Hoist Corporation (division of Columbus McKinnon Chain Company). At a recent meeting the following directors and officers were named: Directors, Julius F. Stone, Julius F. Stone, Jr., J. C. Dunn, A. L. McKinnon and Frederick Mitchell. Officers: Julius F. Stone, president, Julius F. Stone, Jr., vice-president; J. C. Dunn, vice-president and treasurer; Frederick Mitchell, secretary.

ADVERTISING LITERATURE

Engineering & Mining Journal, New York, N. Y., has issued a booklet describing its Market and Quotation Service on metals and non-metallic minerals.

Thompson Electric Company, Cleveland, Ohio, has published a booklet entitled "Standardization and System" including description of Thompson hanger and shock absorber for industrial lighting installations.

Curtin-Howe Corporation, New York, N. Y., announce the appointment of Kenneth M. Bailey as technical sales representative at New Orleans, La.

Ohio Brass Company, Mansfield, Ohio, has issued a bulletin describing its trolley bases, trolley catchers and retrievers, trolley wheels and harps, sander equipment, automatic car couplers and headlights.

Sullivan Machinery Company, Chicago, Ill., has issued a new Bulletin No. 83-J, descriptive of Sullivan angle compound power-driven air compressors of capacities from 300 to 5,100 cu.ft. of free air per minute.

Fuzon Welding Corporation, Chicago, Ill., has issued a bulletin descriptive of Fuzon Welders.

Gunite Corporation, Rockford, Ill., has published a booklet describing its new graphite steel gunite.

American Car & Foundry Motors Company, New York, N. Y., has published a catalog describing its Metropolitan, 40-passenger, all-steel coach.

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Popularize Your Service With Brill Seats

One of the first steps in selling more electric railway transportation is to make the cars more desirable to the public; to equal the automobile in comfort.

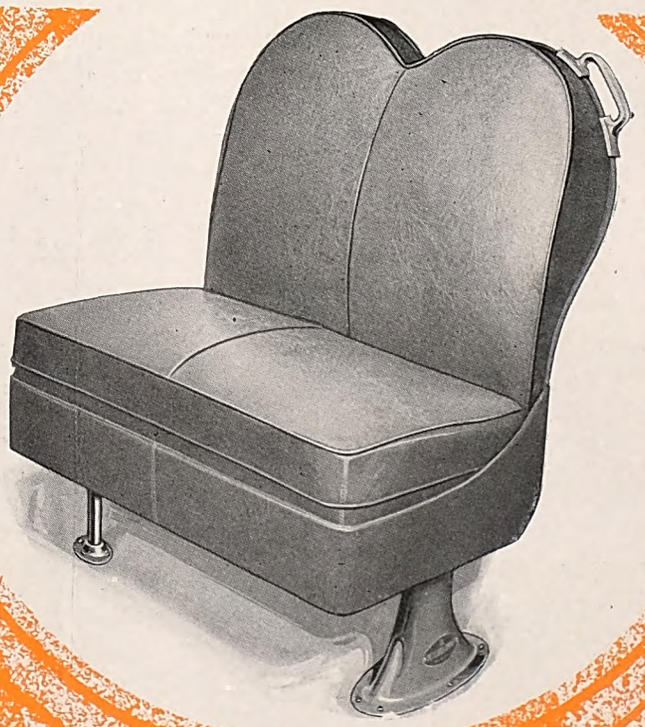
Brill Seat No. 130 with its spring upholstered back and double spring cushion construction compares favorably with any seat designed for automobile use. It is popularizing the service of the Houston Electric Company, where this type seat has been installed in twenty of their single-end cars.

No. 130 is one of a wide range of Brill Seats. They all possess exceptionally comfortable riding and wear-resisting qualities.

Specify Brill Seats—
it pays

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS, MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

Brill Seats Build Transportation Sales



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HASKELITE

33 *of these coaches in Akron*

THE Northern Ohio Power & Light Company has 33 Twin Coaches in service at Akron, Ohio, both on city and inter-city runs.

It is significant that when this electric railway added auxiliary bus service they chose equipment which fully utilizes HASKELITE and PLYMETL and thereby gives maximum seating capacity with minimum weight. The specifications for these Twin Coaches include PLYMETL body panels, HASKELITE floor, PLYMETL roof panels, and PLYMETL interior lining. 75% of the surface of these coaches is either HASKELITE or PLYMETL.

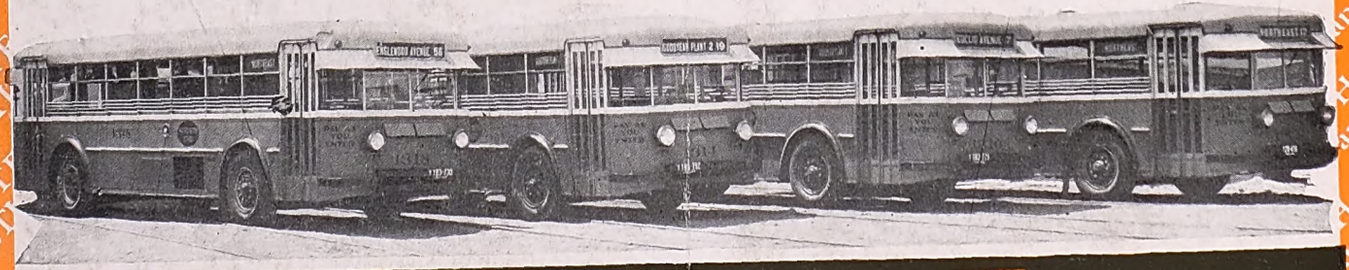
When you are in the market for bus equipment, send for our blue print booklet giving full information on the applications of these light weight materials.

PLYWOOD
HASKELITE
PLYMETL

HASKELITE MANUFACTURING CORPORATION
120 S. LaSalle Street, Chicago

RAILWAY REPRESENTATIVES:
Economy Electric Devices Co., 37 W. Van Buren St., Chicago
Grayson Bros., 600 LaSalle Bldg., St. Louis, Mo.
Railway & Power Engineering Corp., Ltd., Montreal, Toronto, Winnipeg, New Glasgow

ERJ 7-7-Gray



PLYMETL

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. JULY 14, 1928 Twenty Cents Per Copy

MILEAGES far into six figures, run up with railroad-like surety, are expected of the motor coach. Comfort, quiet, safety and attractiveness are essential to get the business. And low cost passenger-miles get the profit. Very logically, nearly every full-fledged motor coach is equipped with Timken Bearings; very many of them at every possible point of hard service.

TIMKEN *Tapered Roller* BEARINGS

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

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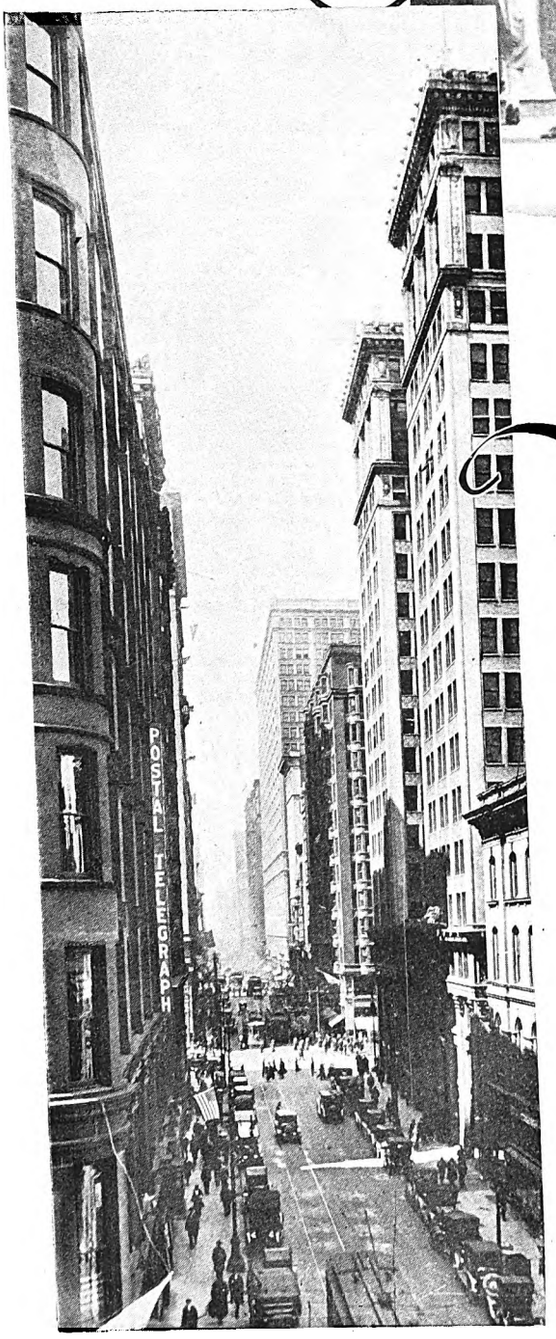

The Spirit of St Louis

EVEN before Col. Charles A. Lindbergh exemplified the Spirit of St. Louis so strikingly to the world, the St. Louis Public Service Company was demonstrating its progressive spirit to the transportation industry by its consistent program of replacing the old, heavy and cumbersome rolling stock of former days with modern, light-weight, comfortable and high-speed street cars.

This is one of the reasons why 63.5 percent of the St. Louis metropolitan population, numbering nearly a million, use electric street cars for its daily transportation.

The availability of this modern electric railway mass transportation is one of the reasons for the remarkable industrial and civic progress of the great crossroad of American commerce—St. Louis.

Again the 510 Motor

The widespread preference for, and reliable operation of Westinghouse type 510 motors are further supported by the four consecutive orders for this motor totaling 200 modern cars in St. Louis. Low maintenance and power costs have contributed to the successful operation of 6800 type 510 motors throughout the world.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER A.E.R.A. 1928

Westinghouse

X98750

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. McGRAW, *President*

Consolidation of Street Railway Journal and Electric Railway Review
CHARLES GORDON, *Editor*

LOUIS F. STOLL, *General Manager*

Volume 72 New York, Saturday, July 14, 1928 *Number 2*

Telling One's Story Not Exclusive Right of Political Propagandist

HIS methods of defense may not always be the best, but that man is a craven who does not jealously guard that which he sincerely thinks is his own best interest. And that appears from the testimony before the Federal Trade Commission at Washington to be where many of the utilities were over-zealous. Certainly they were not secretive. Often they conjured up the existence of a menace where none actually existed. It does seem, however, as one of the commentators put it, that the utilities in many cases paid a tremendous price for trash-basket circulation. That does not mean that the utility clip sheets were not informative. Many of their items have real news value simply because the authors of them have access to information not always available to the outsider. When it comes to the so-called propaganda of pamphlet, textbook and lecture, however, the effect has been likened to the discharge of a battery of machine guns at the ocean. The development of public utilities by private capital has an honorable record. The telling of the utility story, however, has been befuddled, but so has the telling of the story of the present inquiry since publicity given to isolated and scattered portions of the record has resulted in misleading impressions.

It is easy to suggest the exercise of restraint, but it is not so easy to practice moderation of expression when a great industry is harried by jackals ever ready to tear down, in the guise of public interest, the constructive work of other men's hands. Properly to sting the self-appointed guardians of the public interest who have made a great pother about some of these misguided publicity activities would require the scorpion touch of a Brann. Not that some of these utility activities were not ill-advised, for men appear to have been vested by the utilities with power they could not be trusted to exercise wisely. Two wrongs don't make a right. But truth has become strangely distorted and grotesque in the hands of some of the advocates of nationalized industry and government competition with private enterprise. Are the leagues for this and the leagues for that, totally irresponsible and unchecked, and aided and abetted by the Pinchots and the Norrises, to be permitted to say what they would without contravention? That is unthinkable.

One thing is certain. The utilities may in some cases have erred through excessive zeal, but most of them are furnishing incomparable service at terms distinctly advantageous to the customer, judged by any standards of comparison that are available, certainly judged by any standards of municipal enterprise. This is a service they can well afford to talk about in paid space. The telephone company does it in its own forceful way. The light and power utilities and the railways have done so in the past. Just so long as the utilities continue to furnish a class of service which is advantageous to the public, they are more than justified in telling the public about it, and in calling attention to the fallacy of political theories that would endanger that service. Telling one's story is not the exclusive right of the political propagandist.

N.A.C.C. Has Accepted Responsibility to Do Something Constructive

SINCE the attempt to obtain passage of the Parker bill providing for the regulation of buses in interstate service failed in this past session of Congress, the subject of interstate regulation has come up for discussion before two national groups, representing interests that would nominally be assumed to hold opposite views of the situation. These were the Motor Transport Division of the American Railway Association, at its recent annual meeting in Atlantic City, and the Motor Bus Division of the American Automobile Association, which held its annual meeting in Cincinnati, June 27-30. At both these meetings spokesmen for the respective industries represented deprecated the attitude of those who had opposed the Parker bill, and who are generally held to be accountable for the failure to obtain interstate regulation for at least another year.

Representatives of the National Automobile Chamber of Commerce responded to the challenge, stated or implied, that the activities of that body had been responsible for the postponement of regulation. In both meetings the answer was similar; namely, that the N.A.C.C., while not favorable to some of the provisions of the Parker bill, is not opposed to the principle of regulation of interstate buses in the public interest. A. J. Brosseau, speaking before the American Railway Association as chairman of the legislative committee of the N.A.C.C., went farther than did E. F. Loomis, secretary of the N.A.C.C., before the bus division meeting of the A.A.A. in Cincinnati. Mr. Brosseau intimated that opposition to proposed regulatory legislation was based on the fear that, in addition to regulation, the proposed legislation threatened a "shut-out," as he expressed it, for the automotive vehicle.

So much, then, for developments up to date. The proposed bill, which represented the best efforts of the National Association of Railway and Utility Commissioners, the American Railway Association, the Bus Division of the American Automobile Association and the American Electric Railway Association to agree on a regulatory measure which would meet the common views of all these groups, was opposed before the Congressional committee by representatives of the N.A.C.C., and its failure to get by that committee is generally attributed to the position taken by the automobile manufacturer's association. This paper holds no brief for the Parker bill. That measure did, however, seem to be drawn in a spirit of co-operation, and was worked out and modified to suit the views of the several interests represented. Consequently, since the need for regulation is admitted

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even by spokesmen for the N.A.C.C., it seems obvious that in taking the position it did before the Congressional committee, that body has automatically assumed a grave responsibility to the operators of buses. It is particularly significant that the strongest expression of condemnation of the N.A.C.C. attitude was voiced not by a railroad man but by the chairman of the legislative committee of the American Automobile Association's Bus Division.

Everyone seems agreed on the need for interstate regulation. Apparently, also, all of the principal interested groups, with the exception of the N.A.C.C., are agreed on the form and extent of the regulation. Although there were repeated efforts made to have the situation thoroughly thrashed out while a bill was in process of formulation, the N.A.C.C. chose to take a hand only when the matter reached a Congressional committee. In doing that it has definitely assumed the responsibility in the eyes of railway men and of bus operators as well, of proposing something to take the place of the measure to which it objected. It is all very well for N.A.C.C. spokesmen to express accord with the general idea of regulation and to voice a desire to sit down with other interested groups to discuss a basis for a regulatory law. Just why that desire was not expressed during the long period that the Parker bill was under discussion and in process of formulation by all the other groups interested is hard to understand.

Presumably, since the N.A.C.C. finds itself opposed to the views, not only of the railroads but of the Bus Division of the American Automobile Association, it feels that the interests of bus manufacturers are not identical with those of bus operators, or that the A.A.A. Bus Division does not adequately represent the many small as well as large interstate operations that have sprung into existence since the bars were let down on buses in interstate service. Certainly, it is equally as important from the manufacturer's standpoint to protect the interests of the certificated intrastate operator who has already made a large investment in buses, as it is to protect the prospective interstate customer for buses from a "shut-out" due to over-stringent regulation.

It is high time to put aside the smoke-screen of glittering generalities, such as "agreement on the need for regulation," and the "desire to sit down to talk it over." All of the other groups involved have been sitting down and talking it over for some time. What seems needed most right now is a definite statement from the N.A.C.C. of just what it would consider advisable in the way of interstate regulation. Then there would at least be the opportunity of judging just how far that body is willing to go, and how much discussion is necessary before something really constructive can be done.

A Contest Where Everyone Wins

FEW things done in recent years have had an effect in the cause of safety so profound as that of the contest for the Anthony N. Brady memorial medals conducted last year. While the medal was open for competition several years ago, the conditions of the award were so different that the earlier contests were not to be compared with that conducted in 1927. The plan adopted last year of dividing the contestants into three classes, consisting of large, medium and small properties, made it possible for each company entered in the competition, regardless of size, to participate on even terms in the race for honors.

It is gratifying that the award will be given again this year. The same committees on award and on conditions of the competition have consented to serve again, so that careful consideration will be given to all points. According to the plan as announced, safety will not be judged only by the concrete figures of passengers carried or miles run per accident. As in the contest last year, consideration will be given the far more significant items of the success in gaining good will through the development of good safety practices, the improved safety conditions which have resulted from original ideas, the adoption of new developments in safety, particular success in conducting a safety campaign, and outstanding accomplishments in development of co-operation between employees and management in safety promotion, sanitation and health.

There still is much room for better methods of safety promotion and for results that are of still greater value in conserving life. Practice of safe methods does have a real money value, since accident costs are a not inconsiderable part of the total in many properties. There is thus an incentive for each company in the industry to make the best showing possible in everything connected with safety. Whether or not a prize is won this is a contest in which there is no chance to lose, for the satisfaction of promoting safety is in itself a great reward.

Getting on the Band Wagon

WHILE members of the Central Electric Railway Association who attended the recent Cedar Point meeting must have returned to their homes beset by conflicting emotions, there was a spirit of optimism predominant. The atmosphere of gloom that continued well through the first morning's session was dispelled under the influence of indisputable facts, figures and statements presented. An old-fashioned experience meeting took place, with a scramble of all present to get onto the band wagon of optimism. Certainly the attitude of the leaders was most encouraging, and when the delegates had had time to pass sober judgment upon the situation on their own and their neighbor's properties it was evident that affairs might be much worse. While passenger traffic in the Central States, generally speaking, shows a decrease it is proportionately less than in years past. In fact, the downward tendency in passenger traffic seems to have been checked. By better merchandising and a little closer study of public demand the tide may be turned.

The reason for poor traffic on certain properties is all too apparent to a casual observer. Despite notable improvements on some properties, improvements that have in practically every instance been followed by increased earnings, much remains to be done, taking the territory as a whole. There are still too many miles of weed-grown rights-of-way, too many sagging trolley poles, too many dilapidated waiting stations, too many decrepit cars, too many discouraged and slovenly trainmen. These factors have all been an influence in driving away traffic. When they are corrrected the swing in the other direction will begin. An entire generation, educated to ride on rubber, has grown up in this country, but there are still thousands upon thousands of people to whom the electric railway is no less valuable today than it was when first constructed. It is at these people that sales effort must be aimed. They are the first to respond to any evidence of improved service and the

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ones who will most certainly attract others to the cars, both as riders and as shippers.

It is in discussing the freight situation that the operator in the Central territory is inclined to become enthusiastic. With notably few exceptions freight earnings there have been on the increase over a period of years.

On some important properties freight now constitutes a major portion of the gross business, with excellent prospects for further gains in the future. Even in this department there is a serious question as to whether the managements are doing everything possible to get all the business that may be developed. Local jealousies, local prejudices, unwillingness to exchange ideas, a disposition to play dog-in-the-manger often stand in the way of improvements and better relations. Electric railway freight service is of extreme importance to the industrial fabric of the Mid-Western territory, and the possession of a piece of strategic trackage imposes an obligation that should go far beyond the position or disposition of the operator who happens to control it. No local advantage so secured should be allowed to weigh against the interest of the industry taken as a whole.

Once the ice was broken the assembled delegates displayed a commendable disposition to talk over their troubles freely and to discuss ways and means of correcting them. The meeting of the Central Electric Railway Association held at Cedar Point was notable from any standpoint, the more so because of the impressive demonstration of the manner in which the spirit of gloom was dissipated when confronted by the unmistakable evidence of the causes for optimism.

"Ads" That Win Patronage and Prizes

EDUCATION appears to be the underlying thought back of the newspaper advertisements of the Georgia Power Company, The Portland Electric Power Company and the Twin City Rapid Transit Company, awarded first, second and third place respectively in the Better Copy Contest conducted by the Public Utilities Advertising Association. These "ads" received due recognition at the July 10 session of the International Advertising Association meeting which was held in Detroit.

"My job means something to me" was the arresting headline of the Georgia Company's advertisement. To some this expression may sound too fulsome. However, the "ad" performs the double function of speaking to employees and the public simultaneously. The modern trainman, changed physically and mentally, is gradually emerging. What more appropriate than that his company tell the public about it?

In the advertisement of the Portland Electric Power Company the company envisages itself as an educational force. Through a comparison, though not an invidious one, of the automobile and street car, the copy suggests when to use the trolley and when to use the family car. It induces rather than demands. Thus it escapes the criticism which might ensue from the slightly dangerous appeal in making comparisons. The Twin City Rapid Transit Company shows the public that progress and prosperity are indissolubly linked with the street car and its ability to extend its services.

All three advertisements, reproduced elsewhere in this issue, can be considered attention-getters in their pictorial and type appeal. But more significant is the testimony they bear to the changed psychology in the railway business towards better advertising. It is no longer debatable—advertising wins rides, since the product is inherently necessary and worth while. But railway companies must not only advertise; they must have a real message to tell and must use the best media available. Incidentally, in this contest newspaper advertisements captured all the winning places. This better copy movement deserves hearty indorsement and support. It promises to become a strong force in putting public utility copy in the class of simple, timely, well-poised and convincing advertisements.

Brooklyn-Manhattan Transit Dissolves Its Voting Trust

VARIOUS reasons are ascribed to the proposed dissolution of the voting trust under which the Brooklyn-Manhattan Transit Corporation has been conducted since the reorganization of the company in 1923. The reason popularly ascribed is that the termination of the trust is precedent to the conclusion of negotiations by which the city is to take over the railway or a considerable part of it so as to tie the lines in with the system which the municipality is now building. It has been suggested by some that the dissolution of the trust and the application to list 249,468 shares of preferred stock, Series A, and 769,911 shares of common stock, both without par value, on the New York exchange is a step taken to establish a price for the sale of the properties to the city. That, of course, is conjecture. It may or may not be true.

There is no getting away from the fact, however, that the Brooklyn management has done wonders with that system. The career of the road was never more pleasant to contemplate than it is today from the standpoint of the patron and the owner. No stigma attaches to Colonel Williams for his inability to pull the system, run at a 5-cent fare, out of the doldrums of the war period when the balance of economic forces was seriously disrupted. Nor does the work of the present management, headed by Mr. Menden with Mr. Dahl in command and Albert Wiggin and Frederick Strauss as Mr. Dahl's companion trustees, suffer any by contrast with the wonderful work which Colonel Winter did before Colonel Williams in putting the system on its feet.

The reorganization of the B.-M. T. was drastic, but it was no more drastic than the circumstances warranted. Receiver Lindley M. Garrison did what he could, but to rehabilitate the road was not his job. His was primarily a work of conservation. But the system that the reorganized company took over from him has been raised to a physical status and is managed with a celerity few would have dared ten years ago to predict as attainable. Not only that, but the public relations have been improved immeasurably. That much of the success of the company in thus bettering its public relations may be ascribed to the presence on the board of directors of three representatives of the city seems reasonable, since these men are able to bring from the outside just the leaven needed. Even where the management has felt it incumbent to disagree with public officials, the matter has been handled wisely. And that is saying a great deal when it is taken into account that John F. Hylan was the incumbent of the Mayor's office for a part of this time, if only for a small part.

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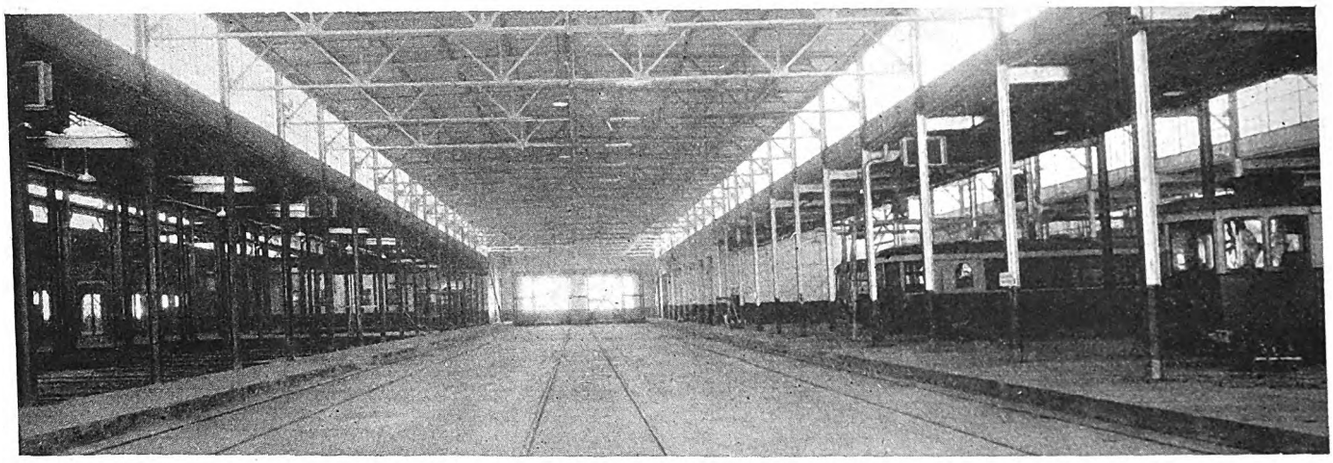
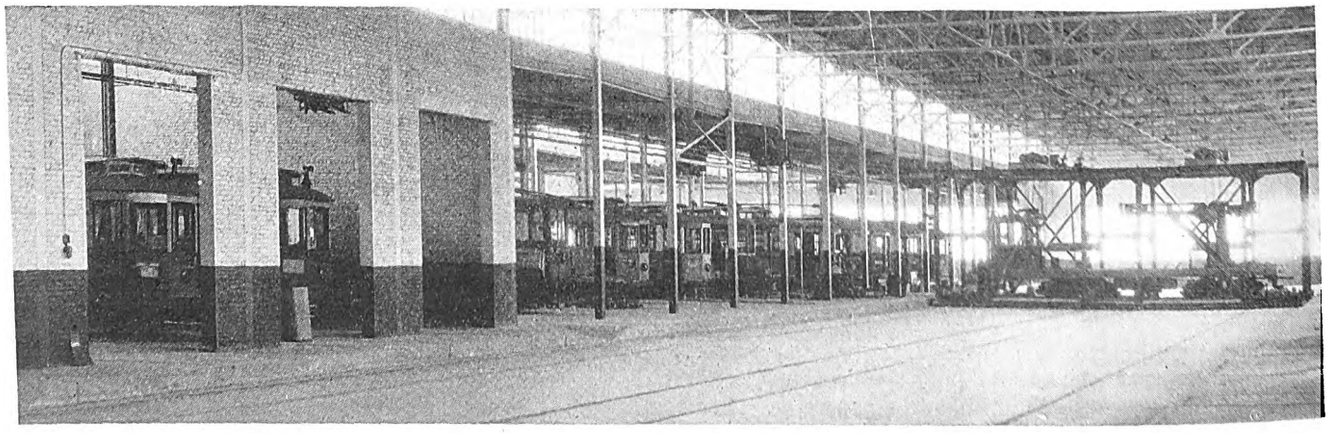
Interior Views of the Winton Shop



Part of the three-track transfer table runway. The truck department is on the left and the body repair department on the right in this view

Main bay through the forge and machine sections. Note the roof construction, affording ample ventilation and natural light



At the left are shown three doorways of the paint shop. Beyond this shop is the body repair section and at the right is the four-motor drive transfer table with car hoist

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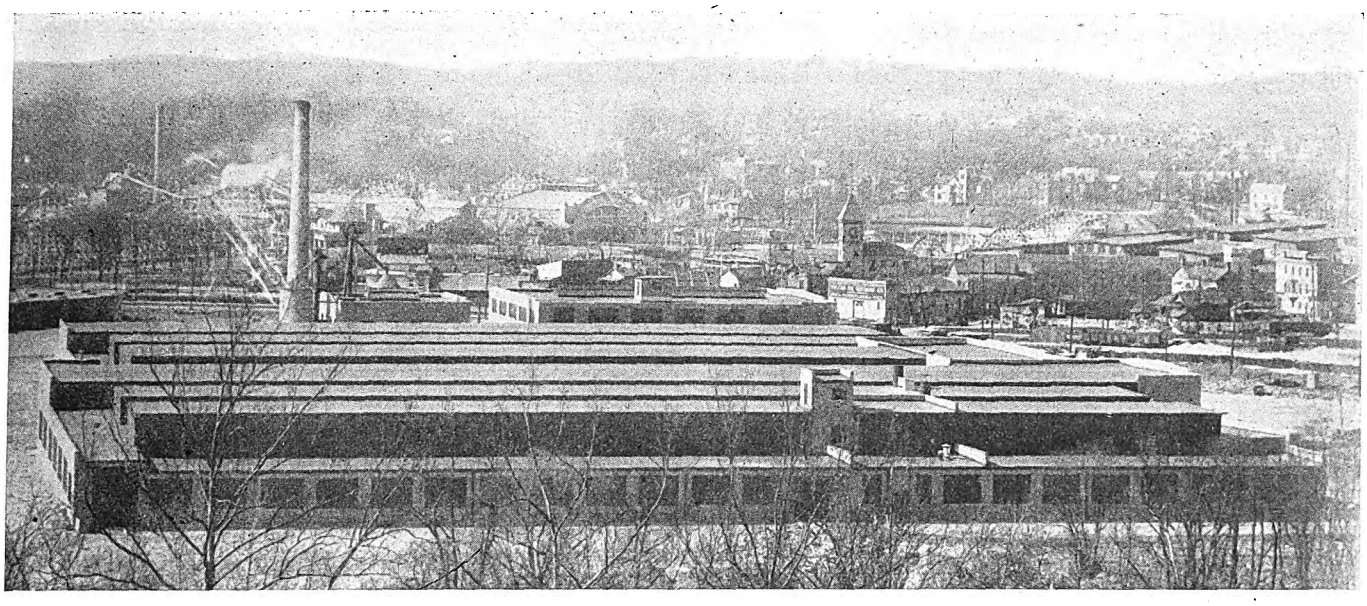

The new Winton car shop of the Cincinnati Street Railway is located about 5 miles north of Fountain Square

Cincinnati Completes

Model Car Shop

Structure built and equipped at a cost of approximately $1,186,000, has a floor area of more than 4 acres. Repair tracks are bisected by a transfer table within the building

By E. J. Jonas
Superintendent of Equipment Cincinnati Street Railway,
Cincinnati, Ohio

COMPLETION of the new Winton car shop on March 24 marked another forward step by the Cincinnati Street Railway in its modernization program. Built at a cost of $986,322 and equipped at a cost of approximately $200,000, the structure represents the utmost in car repair facilities. It is a substantial structure of brick and steel, 400 ft. square and having a floor area, including balconies and basement, of 177,605 sq.ft., or more than 4 acres. It is located in the suburb of Winton, about 5 miles north of Fountain Square, the business center of Cincinnati, and is convenient to several car lines of the company.

The main building, which was started in July, 1927, is now being occupied, but most of the outside track remains to be built. The transfer from the old Chester Park shops was made without serious interruption to production, and the various functions of car repair work are now proceeding in the new shop in the manner as originally planned.

All departments are under one roof with the exception of a boiler house and a storehouse. These two are separated from the main building by an area 32 ft. in width. The transfer table runway extends the full length of the building under a 60-ft. roof span, so that all movements of cars under repair can be made under cover. Repair tracks adjoining the runway are just long enough to accommodate one car at a time, thus avoiding the necessity of shifting any car until all repairs under way on that particular track are completed. As there are but two doors through which cars can enter or leave the building the item of door maintenance is reduced to a minimum while at the same time the change in temperature during the winter which a multiple-door arrangement would produce is avoided. All machine work in connection with repairs is done at the rear of the tracks on which the cars have been run, reducing the distance between the machines and the cars under repair.

The routing of cars through the shop will depend on the nature of the work to be performed. A car undergoing general overhaul, scheduled on a 60,000-mile basis,

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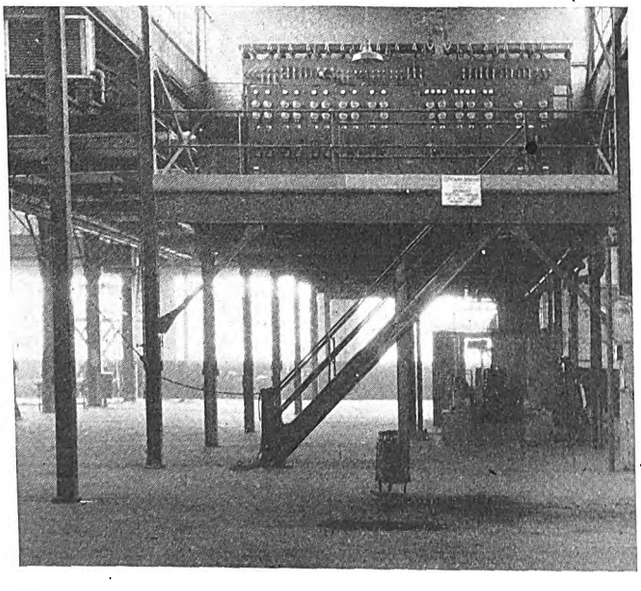
will enter first the sand-blast room. Here it is placed under a set of exhaust blowers suspended from the roof. These carry off all dust and dirt as the cleaning progresses. Through these blowers air is discharged at high velocity and is drawn through ducts in the floor, through a filter and dust arrester and into the blowers again. A circulation of 9,000 cu.ft. per minute is maintained. Air circulates through the interior of the car as it is cleaned of all loose dirt and dust with a high-pressure air hose. Paint is removed by sand-blasting.

Cars Leaving Sand Blast Are Washed

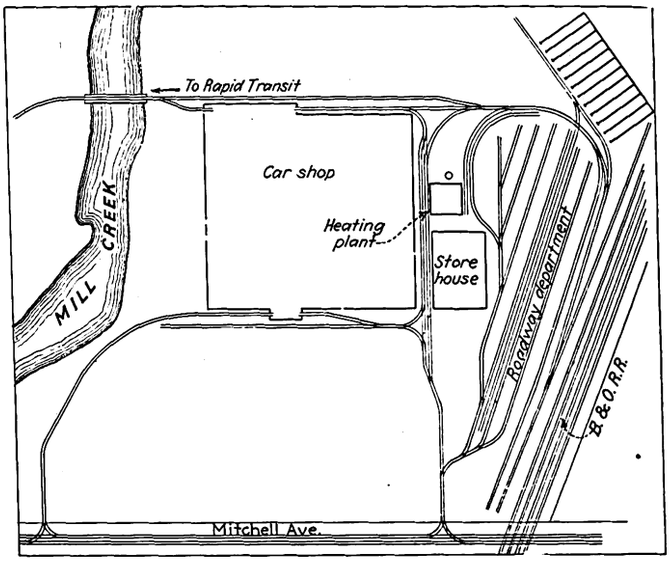
The car then passes to the wash track where water at a pressure of 200 lb. per square inch is used for cleaning the exterior of the car body and trucks. The next move is to the truck repair tracks. The body is raised from the trucks with a four-hook electric hoist, an integral part of the transfer table. Four 40-hp. motors, in series with a K-11 controller, drive the hoist. The trucks are removed from the car by a cable passing near a pulley and winch, also located on the transfer table. The car body is then set down on a pair of light shift trucks and placed on one of the body pair tracks. Each of the shift trucks is equipped with a light motor to facilitate this movement. In a balcony over the carpenter shop is space for seat, sash, register and farbox overhauling and for general light repairing.

Upon the completion of body repair work the car is moved to the paint department. All painting is done in a spray booth, this particular booth being a recent development of the De Vilbiss Company. A small De Vilbiss spray booth for signs is installed in the paint mixing room. It is planned to put a car through the paint shop in three days.

The tracks in the truck repair section are of sufficient length to permit work on two pairs of trucks at a time. Each track is served by a 2-ton electric traveling crane. A tool room, conveniently located near the machine section, is arranged to take care of small tools and has necessary equipment for the manufacture of dies and special tools. Finished trucks with motors are moved to the rear end of the truck repair track, are lifted by a 10-ton electric crane which travels parallel to the transfer table and are placed on a vacant track ready to be shifted under the car body when it emerges from the paint department.



The electrical department is located in this section of the shop. The switchboard on the balcony controls all light and power circuits of the shop



The plant has, in addition to the shop building, a boiler house, stores building and numerous outside tracks

Cars Are Thoroughly Inspected

The next move is to a pit track adjacent to the electrical department where brake rods and motor leads are connected and the equipment is given a final check and electrical test. Each car is given a thorough inspection before it is released from the shop.

As the movement of cars within the shop is, with few exceptions, limited to a car length from the transfer table, no overhead trolley wires are used, thus freeing all repair tracks from the hazard of high-voltage wires. The only 600-volt trolley wires in the shop are those directly over the transfer table. Power for moving cars off and on the table is supplied through a flexible cable, wound on an automatic reel and fed through a jack pole.

Attention was given to elements that would add to the comfort and safety of the workmen. Adjoining the office is a first-aid room equipped to handle minor injuries. It is planned to have one of the workers in the shop care for injuries that do not require surgical attention. A room 48x96 ft. with a 15-ft. ceiling, located above the office and locker rooms, is available as an assembly room. Provision has been made to equip this room at some future date as a cafeteria for the use of employees.

Spacious dressing and locker rooms on the main floor have 150 all-steel lockers, five Bradley washing fountains, five shower baths, toilets and drinking fountains. There are also four toilets and ten drinking fountains conveniently distributed at various points throughout the shops and storerooms.

The large office and drafting room has a northern exposure and has an air of cheeriness. A fireproof record vault adjoins the office.

A feature of the new plant is the extensive use of actinic glass in skylights and windows. The building was designed with continuous monitor roof, with alternate high and low bays and with the large glass areas in side walls allows a flood of natural light to enter in the daytime. The total glass area is equivalent to approximately 30 per cent of the floor area of the entire plant. The plant may be lighted electrically by lamps with

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frosted globe reflectors which give an illumination of 10 foot-candles.

A concrete-lined subway connects the basement of the general stores building with the wheel, pipe, axle and lumber storage rooms in the basement of the main building. The storage room for wheels and other large parts measures 32x188 ft., while the 50x200-ft. basement beneath the carpenter shop allows ample and convenient storage for lumber as well as space for dust-collecting fans and ducts. The subway also serves to carry service pipes and wiring.

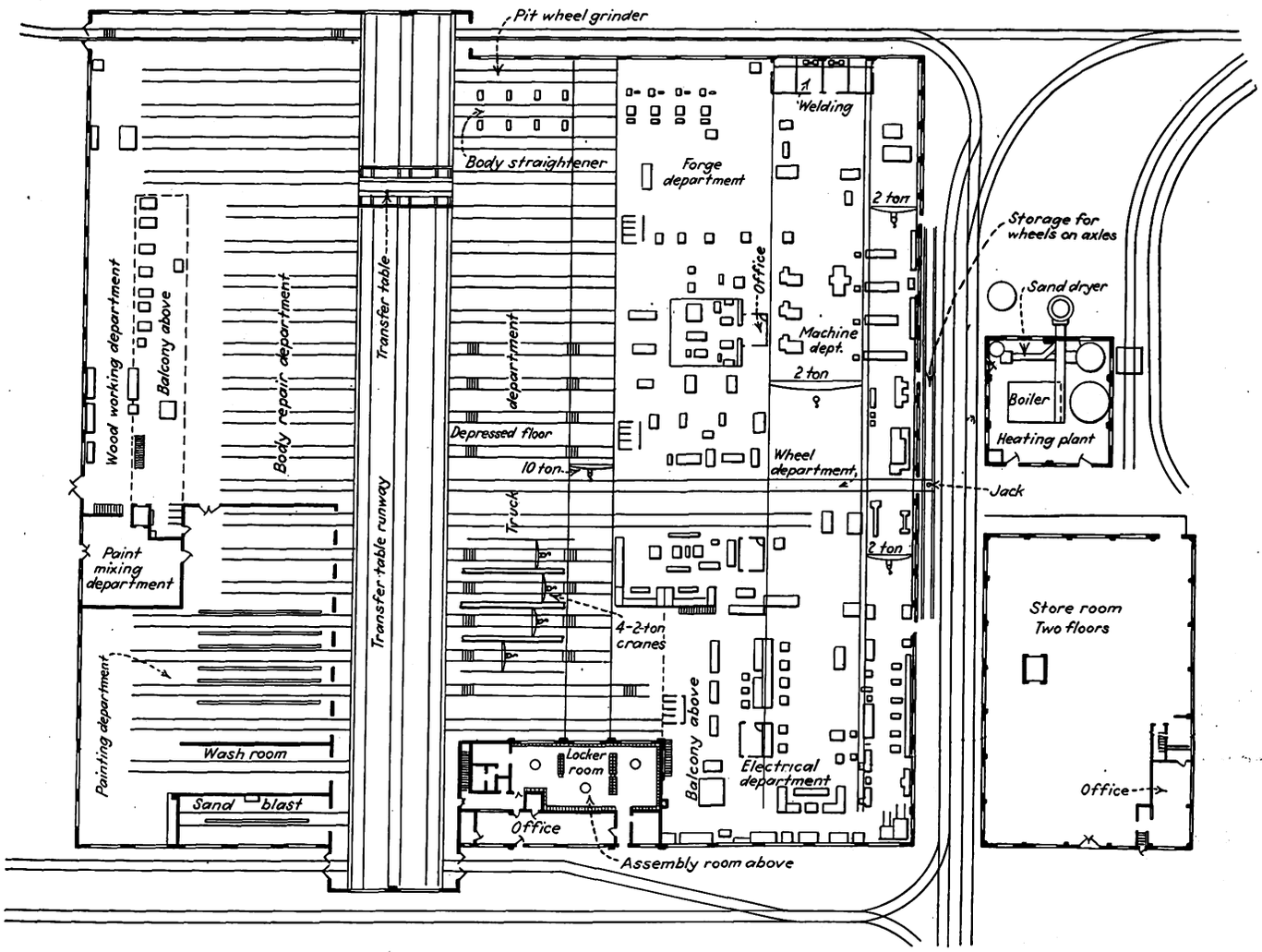
Two Warner heavy-duty automatic electric elevators are installed, one in the storeroom and one in the main building. In addition there is a hydraulic elevator to raise wheels and axles out of basement storage. A special track with offset rails is used for storing mounted wheels. An air jack, developed in the shops, turns the wheels and axles leaving the shop through 90 deg., so they may be placed on the storage track.

Cranes Facilitate Shop Work

There are four traveling cranes, serving 50 per cent of the machine and electrical department areas. These four and the cranes over the truck repair section have 2-ton electric hoists with three-phase, 440-volt motors. As the traveling cranes are not intended for transporting materials over any considerable distance, a 2-ton lift truck with portable platforms is used for this purpose. The truck can be readily moved into any department by the elevators, the subway or the ramps leading to the transfer table runway, whose floor is but 11 in. below the general floor level.

The floor of the transfer table runway is paved with concrete. In the wheel and truck departments, covering an area of 3,840 sq.ft., wood block paving is used. The floors of the machine and electrical departments, which cover 42,624 sq.ft., are of elastite.

In planning the shop consideration was given to the possibility of the company some day operating the rapid transit system which is now being constructed by the city of Cincinnati. A track connection with the rapid transit line, which is to pass within a short distance of the shops, has been arranged for. As the rapid transit line



Floor plan of the new Winton shop of the Cincinnati Street Railway. A transfer table runway, which serves 48 tracks, divides the main building into two parts. The shop corresponding to each repair section is located at the rear of the tracks of that section

FLOOR AREAS IN THE WINTON CAR SHOP

	Square Feet		Square Feet
Electrical department	13,056	Office	1,008
Wheel department	4,992	Locker room	2,752
Pipe department	3,072	Other areas	21,991
Sheet metal	3,062		
Machine department	9,984	Main floor area	150,197
Tool room	1,152	Balconies and basement	27,408
Forge department	9,984		
Welding department	1,536	Total floor area of car shop	177,605
Truck department	11,520		
Transfer table runway	24,500	Storeroom	29,000
Repair department	17,528	Boilerhouse	3,269
Mill department	8,792		
Paint mix department	2,304	Total floor area of entire plant	209,874
Paint department	12,864		

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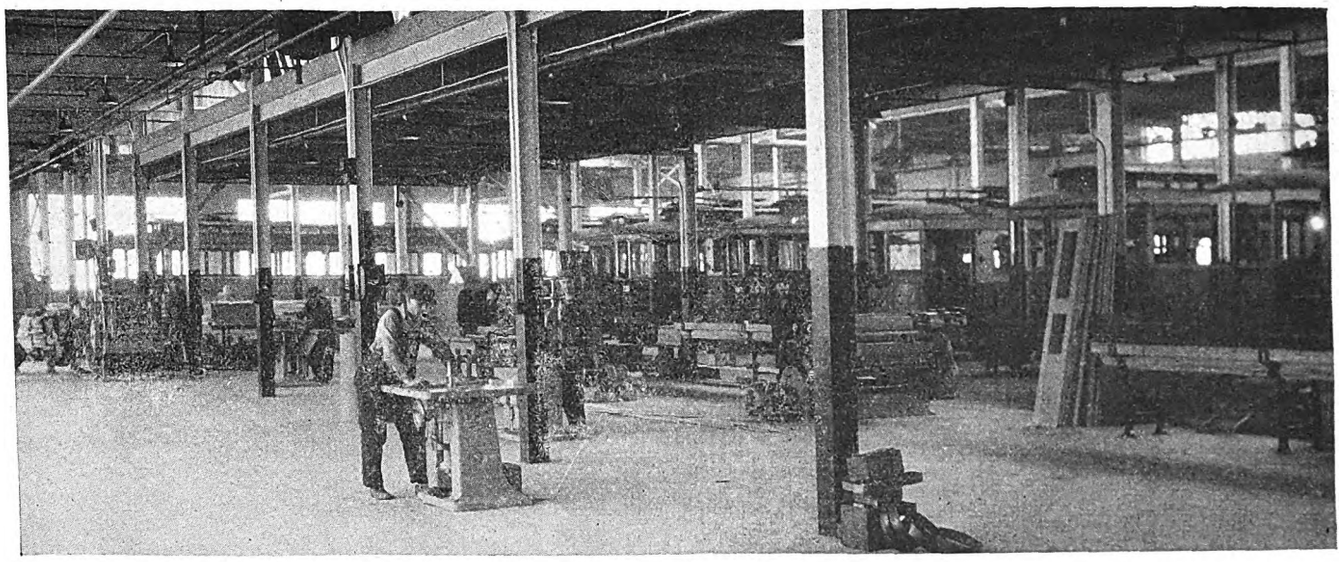


Wood-working section which adjoins the body repair department. The section has a dust-collecting system for the many machines

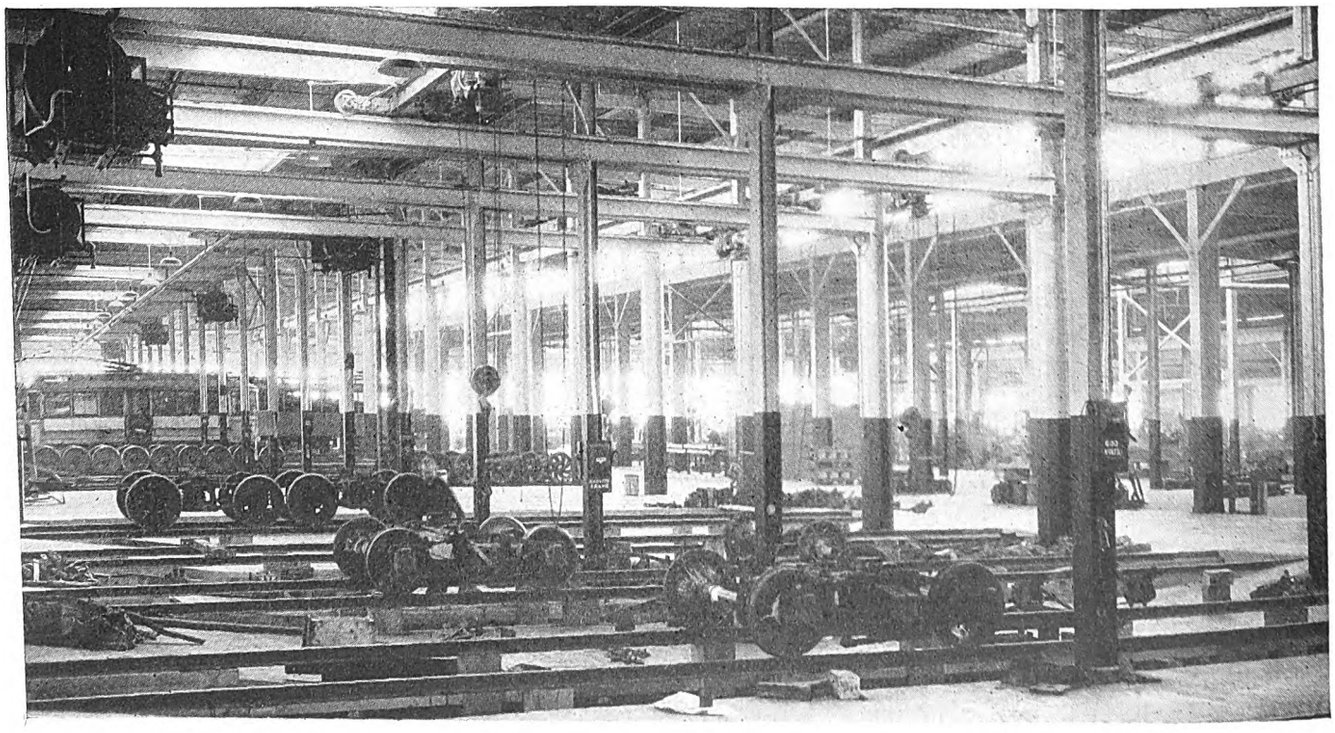
is to be of standard gage and the system of the Cincinnati Street Railway is of 5-ft. 2½-in. gage, it was necessary to double-gage much of the trackage in the shop. This also permits the entrance of standard gage steam railway cars to the shop and yards. A standard gage track also has been laid along the area between the shop and the storehouse and boiler room to permit the entrance of steam road cars with coal, sand and other supplies.

All wiring is carried in rigid conduit. The service pipes and conduits, wherever exposed, are readily identifiable by a contrasting color scheme, the sprinkler system being painted red, cold water pipes blue, hot water pipes yellow, lighting and power conduits aluminum, gas pipes black, air pipes green, live steam pipes maroon and the vacuum and steam return system chocolate. The sprinkler system carries 210-lb. pressure.

The storeroom with its two stories and basement is of monolithic concrete. The building has separate offices for the storeroom attendants and a fireproof vault.

The boiler house is especially well designed in every detail. It has two boilers of the Tudor type, each with a nominal rating of 250 hp., fed by electrically-operated Riley stokers. The system is insulated so effectively that it is necessary to obtain heat for the building in the winter time from the flue gases. A unit heater system utilizing low-pressure steam from the boiler house is installed in the plant. Six fans and 46 unit heaters for the system were supplied by the American Blower Company. Each blower motor is thermostatically controlled to maintain a uniform definite temperature throughout the plant. Direct radiation is used in offices and to some extent in the paint shop. During hot weather, when the heating plant is not needed, the same system of blowers is used for ventilation.

Of special interest is the sand-drying apparatus. Sand



Section of the truck department. Depressed floor areas and several overhead cranes make the repair work easier for the shop men

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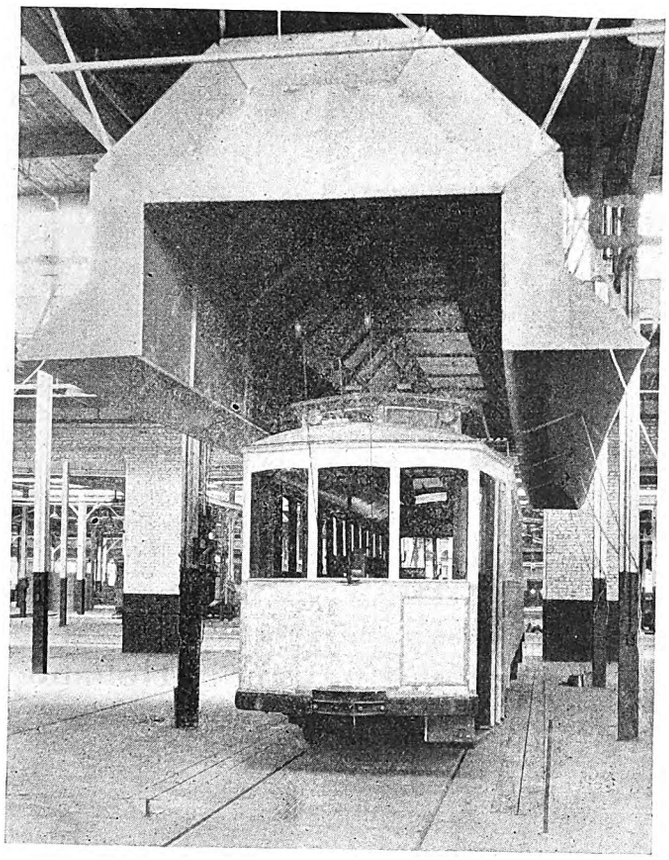


Spray exhaust hood in the paint shop. Fresh air is forced through the two slots in the floor by a blower fan and drawn from the hood above by an exhaust fan

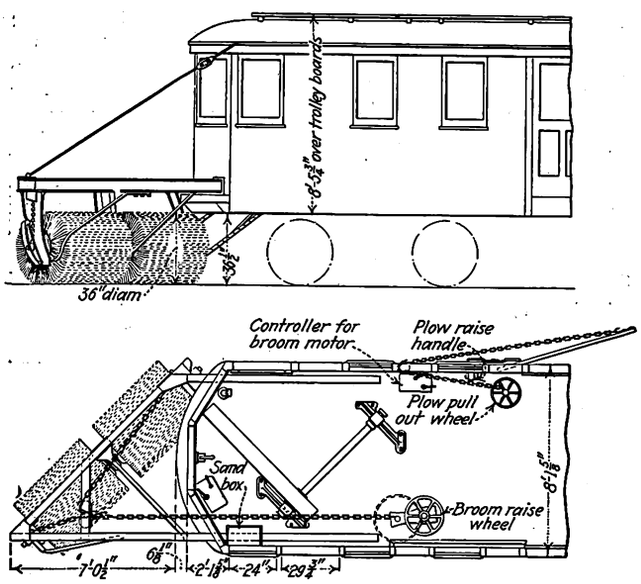
is brought into the plant in steam hopper cars and is dumped by gravity into a container adjoining the boiler house. The sand is then lifted by a conveyor into a 100-ton hopper within the boiler house, from which it descends to a revolving iron drum. The drum is 3 ft. in diameter and 25 ft. in length, is lined inside with baffle plates and is set at a slight pitch. As the sand moves through the drum, exhaust gases from the breeching are passed through it, removing all moisture. After passing through the sand the gases are drawn into the breeching again and pass out the flue. When the boiler is not in use a small direct-fired furnace furnishes the heat for drying. Before leaving the drum the sand is screened. The screenings are emptied into a storage bin of 10 tons capacity from which they are taken as needed by the line department for filling around poles. The dry sand is conveyed to a hollow tile silo which holds 300 tons. The apparatus can dry 2 tons of wet sand of 15 per cent moisture content per hour.

The contracting firm for the plant was the Fisher-Devore Construction Company of Cincinnati. Architectural and engineering details were directed by Harry Hake, architect, working in collaboration with the mechanical department of the Cincinnati Street Railway. As the company is working under a service-at-cost franchise, all expenditures were approved by the Department of City Transit.

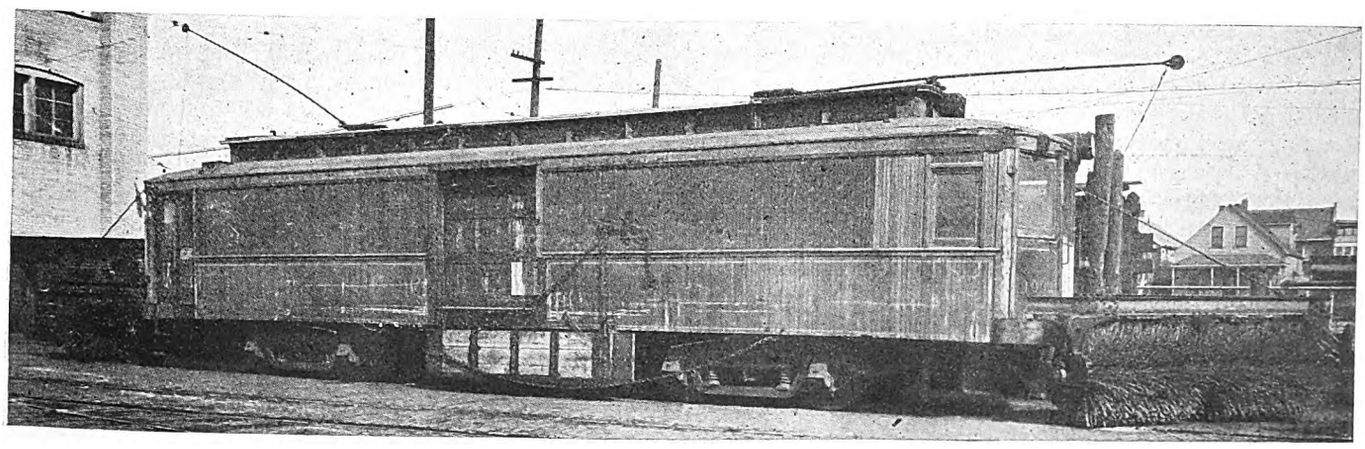
Cars Revamped into Snow Fighting Equipment

FOLLOWING a severe snow on New Year's Day, the Gary Railways, Gary, Ind., immediately remodeled six of its retired passenger cars for snow fighting at a total expenditure of approximately $22,000.

These six cars were equipped with Cummings Car & Coach Company standard snow sweepers and plow mechanisms. Rebuilding of the cars began Jan. 20 under the direction of a crew of men from the Paris, Ill., shops of the Cummings company. Working uninterruptedly for nearly a month in the car shops of the Gary Railways this group converted two of the old double-truck



Snow sweeper mechanism installed on four passenger cars was standard equipment of the Cummings Car & Coach Company



This car with its two sweepers weighs 47,000 lb. A single K-28 controller wired through a circuit breaker governs the operation of two GE-80 broom motors

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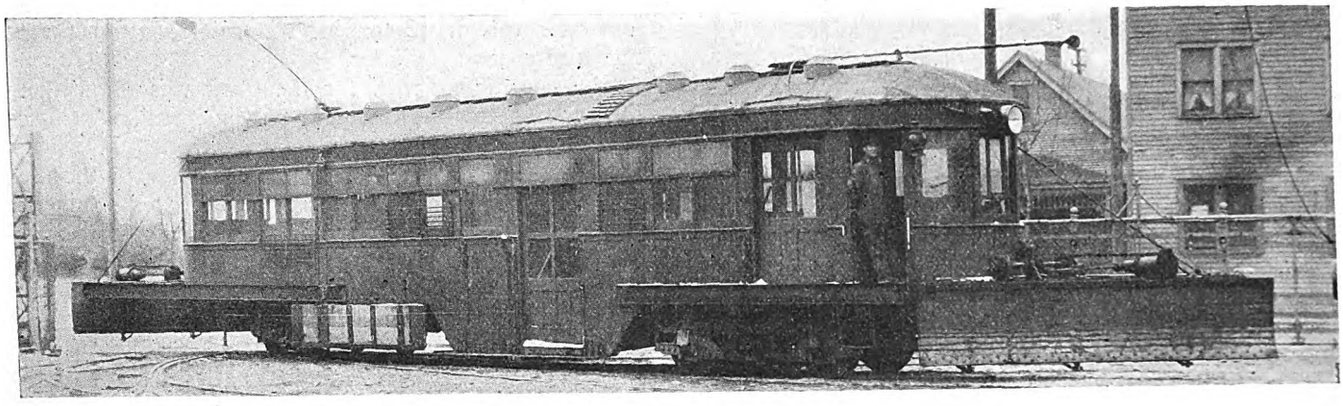
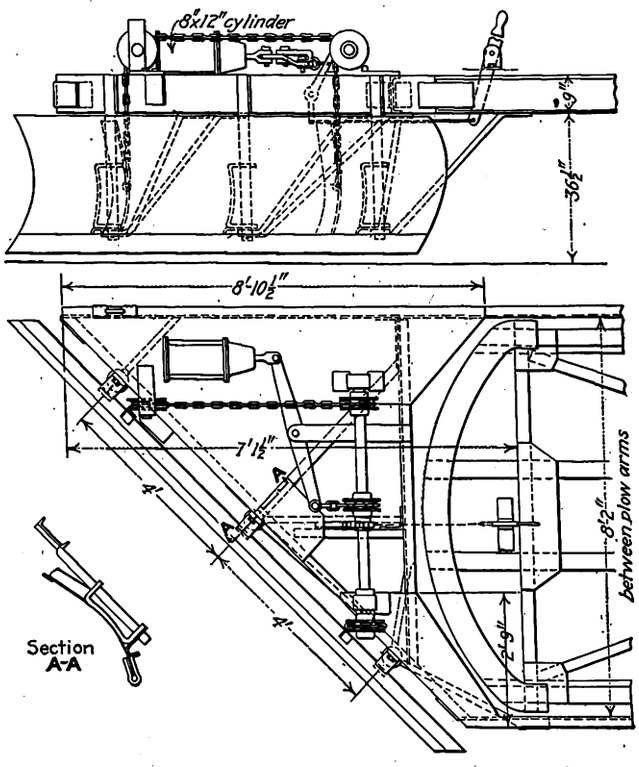


This center entrance car was converted into a shear plow



The shear plows put on two cars are operated by air from inside the car

cars into shear plows capable of a speed of 50 m.p.h., while the remaining four units were remodeled into snow sweepers. The two former cars were so arranged that the plows, located at the ends, may be raised and lowered by air under the control of the operator within the car.

The rotary brooms have individual driving motors with a single controller, the electrical circuits being opened by a specially-wired circuit breaker.

Four of the cars were completed when a severe snow storm struck Gary the night of Feb. 17, and continued unabated for a night and a day. When the storm started the four newly-adapted snow fighting cars were put to work. A fifth was so nearly ready that the construction crew elected to work all through the night of the storm, and this one was in service early the next morning and did its share in clearing the streets. Contrasted to the equipment with which the January storm was fought, the February blizzard found the company with three double-truck sweepers, three single-truck sweepers, and four plows, two being of the vertical, shear type, the other two of the nose type.

A comparison of costs showed that fighting the storm of Feb. 17 required an expenditure of only $1,980 as contrasted with $5,659 for New Year's Day, with the limited facilities then available. In addition to this, the street car receipts were $1,000 greater than those during the previous storm, and the good will of the company was unquestionably enhanced due to the material reduction in interruptions to schedules.

Railway Electrification in Holland

SO FAR the only portion of the Netherlands State Railway system's main line electrically equipped is between Rotterdam and Amsterdam, about 54 miles. For passenger service, most of the trains consist of five cars, of which the first and last only are motor cars. Through trains are hauled by steam locomotives, and the freight service of the line is still given by steam. In addition, a branch line connecting Rotterdam, the Hague and Scheveningen has been changed from single phase to direct current to conform to the main-line equipment.

Power is purchased from existing commercial stations and is converted to 1,500 volts d.c., which is used on the trolley line. The consumption of energy on the lines so far equipped is expected to be about 30,000,000 kw.-hr. annually. This estimate is based upon a traffic of about 5,000 train-miles per day on the main line, and about 2,300 train-miles on the Scheveningen branch during the summer and 2,000 train-miles during the winter. These total about 2,500,000 train-miles annually.

Collection of energy from the overhead system is by two pantographs and there are two overhead wires for each track. This arrangement reduces the current to be collected at each contact. Another novel feature of the overhead is that the supporting poles are not painted but were covered with zinc by the Schoop process. This method was adopted because a considerable part of the line is close to the North Sea, and the danger of rust is great.

Each five-car train on the main line accommodates about 322 seated passengers, with standing room for about 120 more. The motor cars weigh about 60 metric tons and the trailers about 40 metric tons each, so that the weight of a five-car train is about 240 metric tons. This gives a weight per seated passenger of some 1,650 lb. as compared with 2,090 lb. for a five-car steam train with the weight of the locomotive included.

The distance of 54 miles between Rotterdam and Amsterdam, with five stops, is covered in 66 minutes. A train can accelerate to 60 m.p.h. from a full stop in about three minutes. Each motor car is equipped with four 190-hp. motors with electro-pneumatic train control. The control voltage is 240 volts, which is also the voltage used for the electric lighting. The cars are equipped with air brakes and the over-all length of each is about 65 ft.

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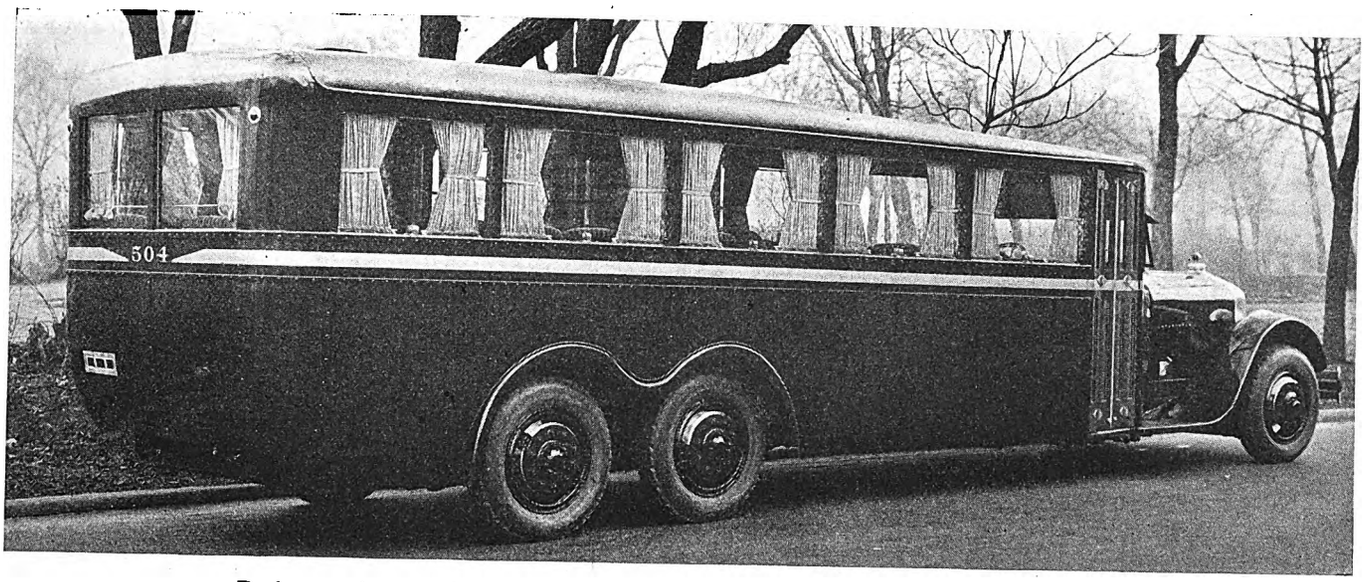


De luxe equipment of the company consists of five six-wheel, 30-passenger Safeway buses

Bus Service Rearranged in Kansas City

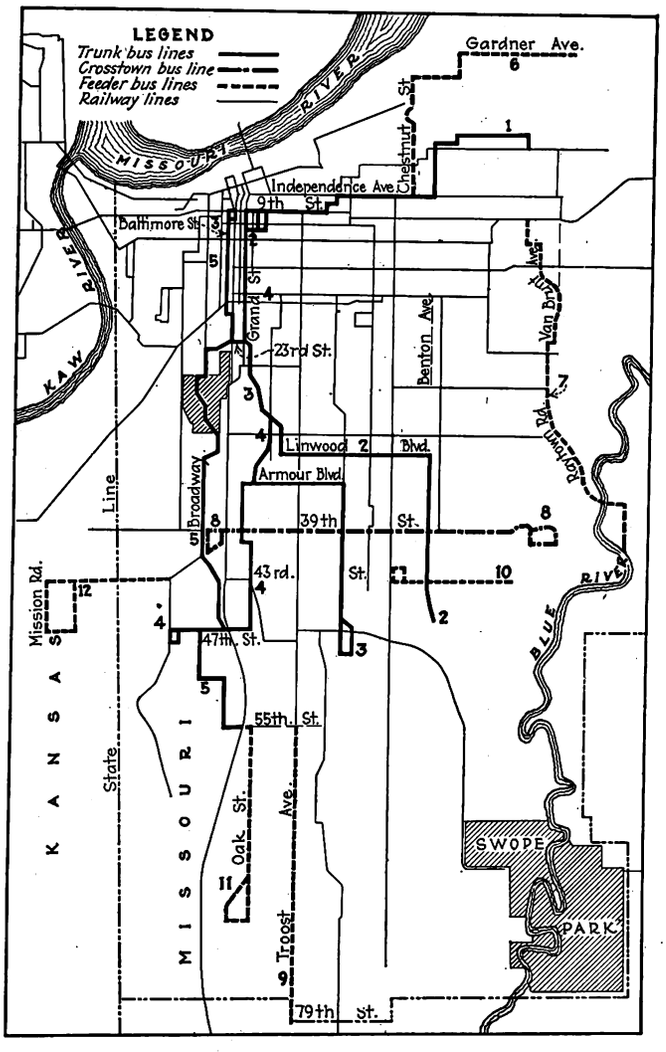
Five trunk lines, one mid-city crosstown line and six feeder lines operating under new bus ordinance. Fare on trunk lines increased to 15 cents, while fare on other lines remains 10 cents

UNDER the ordinance recently passed by the City Council of Kansas City, Mo., a rearrangement of the bus service was put into effect by the Kansas City Public Service Company. The plan, which is to remain in effect for six months ending Nov. 30, allows for approximately 3,000,000 miles a year, an increase of about 350,000 miles over the former arrangement. This increase is principally in feeder service, giving transportation to districts heretofore unreached.

It is believed that the rearrangement of routes will better serve the public convenience, and partially reduce the large operating losses incurred in rendering bus service. Fares on the crosstown and feeder lines will remain 10 cents, as heretofore. Fares on the trunk lines will be 15 cents for one way, an increase of 5 cents.

In the accompanying map are shown the present bus routes in the city. There are five trunk lines, one mid-city crosstown line and six feeder lines. Three of the trunk lines were unchanged, while minor changes were made on the other two. The crosstown line operates on 39th Street, and connects with nine street car lines and four bus trunk lines. Two of the six feeder lines are entirely new, while a third was extended considerably.

Free transfers are issued to and from the 39th Street crosstown line and the four bus trunk lines it crosses. Free transfers are also issued for certain intersecting street car lines. Transfers, however, are not issued on street car lines for the bus trunk lines. On the mid-city crosstown line, 3-cent transfers from connecting street



Bus routes of the Kansas City Public Service Company extend over a large area of the city

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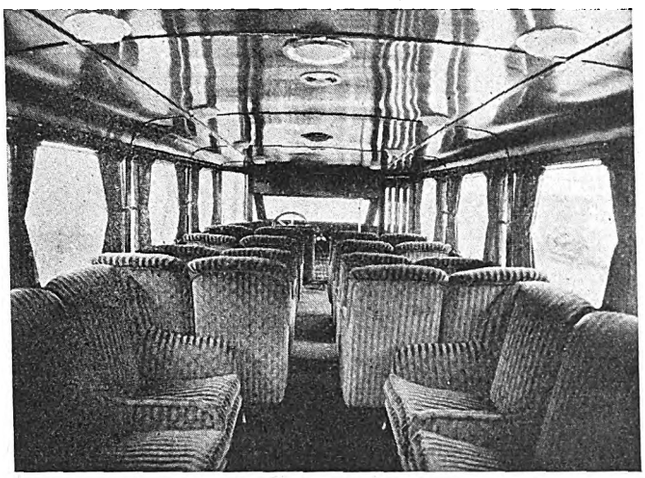


Interior of one of the de luxe buses

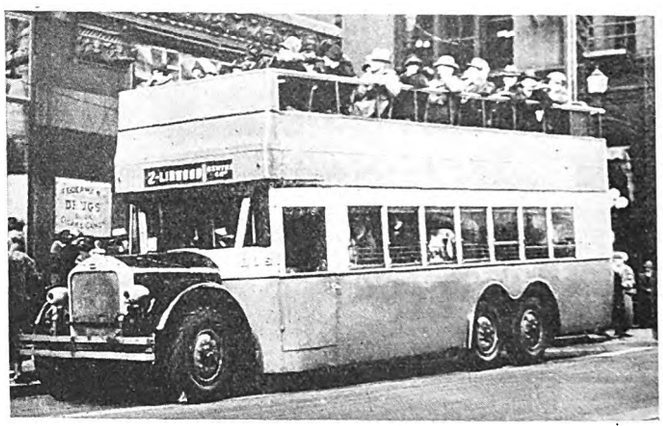
car lines and free transfers from connecting bus trunk lines are accepted, and 5-cent transfers to connecting bus trunk lines are issued. On all the feeder lines, free transfers are issued to connecting street car lines, but a charge of 3 cents is made for a transfer from a street car line to a feeder line.

The hours of service on the trunk lines are from 7 a.m. to 11 p.m. on business days, and from 7:30 a.m. to 11 p.m. on Sundays and holidays. The crosstown line starts at 5:45 a.m. and runs to 11:45 p.m. on business days and from 6:45 a.m. to the same closing hour on Sundays and holidays. On two of the feeder lines service is given only during the rush-hour periods. On the other lines, the buses run throughout the day.

A pamphlet was prepared describing the new routes, the schedule of fares, the transfer privileges and hours of service. Starting the day before the new plan went into effect, 100,000 copies of this pamphlet were distributed to street car and bus riders, to hotel and apartment hotel guests, to hundreds of home owners and to several thousand business men.

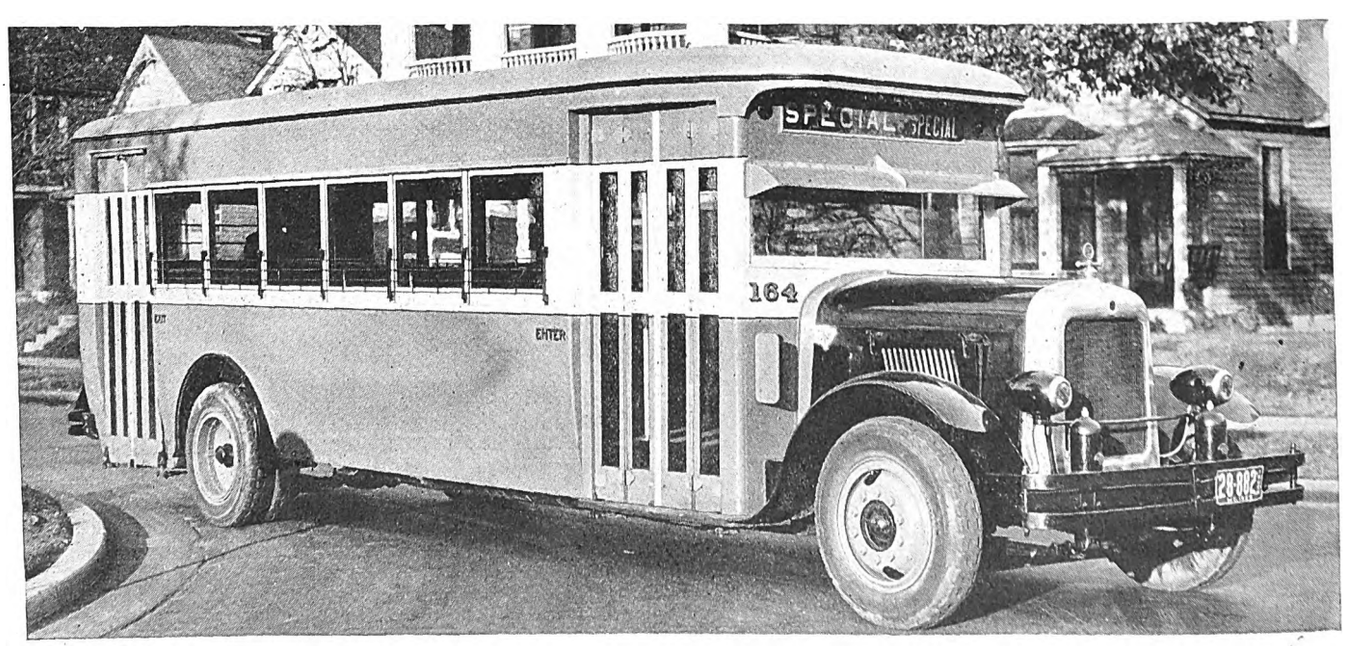
Checks made by the company show that there has been no decrease in patronage as a result of increasing the fare on the trunk lines. Although the double-deck buses did a light business the first few days, this was believed to be caused by disagreeable weather. On the whole, the patronage was practically the same and the patrons indicated that they were willing to pay the 15-cent fare.

The bus system in Kansas City was started in the fall of 1925 to meet a public demand for buses. Service was begun under the terms of an ordinance dated April 7, 1925, and expiring June 7, 1928. The short term was specified because of the uncertainty surrounding bus transportation. It was felt that with experience under actual operating conditions, what was best for the company, the passengers and the city could be determined.



Double-deck buses are used on two of the routes. Eighteen 63-passenger Safeways are in service

On March 30, 1928, the railway submitted to the Council a report with suggestions covering the present operation of buses, and proposed rerouting and rearrangement of the system. The Council gave careful consideration to all figures and suggestions presented and on May 21 granted a new motor coach permit to the company. The new lines and the establishment of a 15-cent fare plan were the two important features of the new bus ordinance.



Twenty-five 30-passenger Yellow coaches, six of which have gas-electric drive, are operated by the Kansas City Public Service Company

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Interesting the Utility Employee in Education

By James L. Lovitt
Director Training and Education Philadelphia Rapid Transit Company, Philadelphia, Pa.

Instruction program of the Philadelphia Rapid Transit Company, planned after studying questionnaires filled in by employees, covers numerous subjects pertaining to the electric railway industry. Enrollment of 4,000 during the first year is evidence of its success

Students taking Public Speaking are not only taught how to speak, but also are given practice in elementary parliamentary procedure and informal debate

"IT WAS in making education common to all, that the destiny of the free republics of America was practically settled," wrote James Russell Lowell. For a people to maintain a political democracy they must be equipped with an education sufficient to understand the "why" and the "how" of things. This inter-relationship of education and self government has its counterpart in an industrial democracy.

Inasmuch as the employees of the Philadelphia Rapid Transit Company are substantial owners of the property, it is logical to expect that they would receive a practical educational program with considerable enthusiasm. Such a program was inaugurated a little more than a year ago by Mitten Management in accordance with its long established policy of providing the employees of the properties under its direction with every opportunity for bettering themselves. The fact that approximately 4,000 enrollments were tallied for courses offered during the first year by the newly instituted training and educational division is evidence of the willingness of the workers to assume the responsibilities which should rightly accompany the ownership of industrial property.

In considering this rather encouraging number participating in the educational program two factors are significant. Firstly, the courses were selected and developed on the basis of a questionnaire distributed among the employees to determine exactly what type of training they considered of value in assisting them in their industrial life. Secondly, the enrollments were entirely voluntary, no pressure of any sort being brought to bear to establish record enrollments.

The danger of having the employees expect immediate promotion upon the successful completion of a course was forestalled by an announcement of a definite policy that the primary intention of the education program was to assist the men to attain the highest standard of performance on their own jobs and that as promotional opportunities occurred those who had proved their worth

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on their own jobs would be the logical selections for increased responsibilities.

Issue of the questionnaire referred to above was the first thing that the training and educational division did. Five thousand copies were distributed, and the returns, representing a cross-section of employees of all departments, constituted a sound working basis for developing the program. The result was 3,627 requests for courses of various kinds. In addition to a heavy demand for practical and specific company courses, subjects such as English, Spelling, Grammar, Bookkeeping, Accounting, Economics and Elementary Arithmetic were high in the popularity scale. In fact, English led the list by a considerable amount.

It was deemed inadvisable, however, to duplicate the work of existing local agencies which are successfully conducting educational work in these basic subjects. It was therefore decided to encourage the men to enroll in the outside schools for this type of instruction and to establish an educational advisory service to counsel with the members of the organization regarding their educational needs.

The P. R. T. courses are developed entirely by men within the organization who, through their intimate contact with the industry, are able to construct text material which would supply the practical educational needs of the workers. Likewise, the entire personnel of instructors is drawn from the organization, specialists in their particular field with a background of practical accomplishment. The selection of instructors is made very carefully, bearing in mind not only technical qualifications, but also personality, so necessary for successful teaching.

Correspondence Courses Instituted

In an industry such as transportation, requiring continuous operation, a considerable number of those desiring educational courses would necessarily be deprived of the opportunity of attending evening classes due to their hours of employment. This problem was met by instituting home study or correspondence courses. An employee enrolling for a course receives his first lesson in pamphlet form with an examination paper appearing on the last page, perforated at the binding. After studying the assignment, he answers the questions and submits them. His paper is marked, recorded and returned to him corrected, along with the next lesson. The plan provides for individual attention, and letters offering advice and suggesting further reading are sent frequently. Because courses offered deal with subjects specifically developed for the needs of a particular organization, the text material is not of a general character and is not obtainable elsewhere.

The correspondence method, therefore, has an added advantage in that the complete set of lessons of any course, becoming the property of the employee constitutes an excellent reference text. The lesson pamphlets are punched for retention in a standard size loose-leaf binder.

Correspondence courses may be started and completed at the convenience of the employee, but it is interesting to note that the element of procrastination is extremely small, very few allowing more than two weeks to elapse between lessons, and a negligible number dropping courses.

The attendance at the evening classes, which are held from 7:30 to 9:30 p.m. on the property, is another indication of the desire for industrial education. The average attendance for all courses given so far was 68 per cent, while 29 per cent have established 100 per cent attendance records, an outstanding achievement for industrial classes conducted on a voluntary basis.

General Subjects of Entire Electric Railway Industry Offered

The more one can visualize just exactly where his particular work fits into the complete industrial program, the more satisfied and productive he will be. "The Electric Railway Industry" was the first course offered and came as a result of a desire upon the part of the men to become more acquainted with the organization as a whole; to get a broader viewpoint of the workings of the various departments of not only their own company, but of the industry in general. The text was carefully prepared by major officials and embraces the following topics:

"Development of the Street Railway Industry," by W. K. Myers, former president of P.R.T. and now vice-president of Mitten Bank Securities Corporation.

"Transportation and Traffic," by W. J. Beadle, traffic consultant and former manager of transportation.

"Construction and Maintenance-of-Way," by J. H. M. Andrews, an authority on roadway and assistant to the president.

"Maintenance of Equipment," by G. H. Stier, superintendent of rolling stock and buildings, and F. L. Hinman, superintendent of shops.

"Generation and Distribution of Power," by H. G. Werner, in charge of the electrical department.

"The Motorbus," by R. H. Horton, former president of the bus organization and an authority on bus transportation.

"Materials," by W. E. Scott, superintendent of materials and supplies.

"Importance of Employees in Public Utilities," by Dr. A. A. Mitten, executive vice-president Mitten Management.

"The Value of a Public Utility," by C. J. Joyce, a management official and an expert on the legal phases of transportation as well as the valuation of public utility property.

"Claims," by J. J. K. Caskie, general attorney.

"Finance and Accounting," by C. E. Ebert, comptroller Mitten Bank Securities Corporation and an expert on public utility finance.

"Public Relations," by J. M. Shaw, vice-president Mitten Management, responsible for public relations policy on Mitten properties.

The above series was followed by a general review. This course was at first presented weekly at evening lectures, followed by discussion, and was attended by 320 employees. The material was later presented as a correspondence course and was met by an enrollment of 660, which is being augmented daily.

Course Given to Develop Better Leaders

Industry becoming more and more humanized, those qualities which are essential to successful leadership in any field are becoming more and more important to the ambitious industrial worker. The course, "Handling Men," prepared by E. J. Benge, from his wide experience in industrial relations, presents and discusses the principles and accepted practice of conducting human relationships, including the handling of subordinates. It is a practical course intended to develop a better quality of industrial leadership and to develop potential supervisors. The lessons embrace: the Problem of Human Relationships, the Supervisor's Job, Stimulating Subordinates, Control and Discipline, Appeals for Better Work, Force of Habit, Training Insures Careful Work, Self-Development, Difficulties with Subordinates, and Co-operation.

Included with this course also are some self-analysis tests and hints for self-improvement. This material is so arranged that the employee, if he so chooses, can get a

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A split-engine, other experimental equipment and moving pictures are used in the Gas-Electric Bus Course

fairly accurate picture of his personal assets and liabilities, and in this way can be guided in his own personal development program. Such tests as vocabulary, memory, general information and arithmetic are included and an easy method of comparing his scores with the average is given.

"Handling Men" has proved popular, 55 employees having taken it in the evening sessions and 673 enrolling for the correspondence course.

Principles in Dealing with Public Outlined

The problem of developing good public contacts is an extremely vital one for a public utility. "Public Relations" is a course that covers the broader features of the company's dealings with the public, describing the accepted principles of public utility economics and revealing the importance of the new and highly practical development of the co-ordinated transportation business. J. M. Shaw, vice-president of Mitten Management in charge of public relations, is the author of this course. The lessons embrace successively: Our Transportation System in Its Relation to the Public, the Public Relations Problem, Production and Participation—The Heart of the Industry, Relation of Fares to Service, Monopoly Versus Competition, Informing the Public, the Newspaper as a Public Utility, Complaints and Commendations, Relations with Civic Bodies, Relations with Schools and Churches, Customer Ownership and Its Effect on Public Good Will and Advertising to Sell Transportation.

Like the two courses mentioned previously, this was offered in the classroom first and later in correspondence form, 30 employees taking the first classroom course and 318 to date having enrolled for it in correspondence form.

Fundamentals of Electric Car Taught

A fuller knowledge of the equipment and the best operating methods undoubtedly contributes to the making of better and more interested trainmen. The course, entitled "The A. B. C. of the Electric Car," was designed to acquaint the non-technical men of the organization with the fundamentals of electric railway operation. The topics cover: Motor Analogy of the Electric Car System, What Starts the Car, How the Control Works, Simple Relation of Flow of Current, Some Details of the Car Equipment, Mounting of Motors in Truck of the Car, How the Car is Driven by the Motors, the Motor and Its Windings, Magnetism and Magnetic Lines of Force, the Electro-Magnet, What Makes the Motor Turn, What Makes the Motor Reverse, Electric Circuits on the Car, Open Circuits, Grounds and Short Circuits, Trolley and Third Rail Electric System, Feeder Systems, Rail or Ground Return and Electrolysis, Description of Safety Car Control Equipment and Rules for Operating the Air Brake and Safety Car Control Equipment.

The stenographic courses develop secretaries with a practical knowledge of the city transportation business

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Three months after its announcement this course had received an enrollment of 451.

The rise of bus transportation and a description of the gas-electric principle are given in the "Gas-Electric Bus" course. It includes a study of the engine, ignition, the generator, control equipment, the motors and chassis of the gas-electric bus. A split-engine is used for demonstration purposes, as well as considerable experimental equipment and moving pictures. Two courses were offered in the evening series, receiving a total enrollment of almost 300 employees. The course will be offered in correspondence form at a later date. Courses designed to assist those engaged in the taxicab branch of the company are being developed and will be offered shortly.

Course Teaches How to Manage Storerooms

So much capital is tied up in the supplies department of a large industry that the storeroom is certainly a place where scientific management can result in considerable economies. The course, "Stores Methods," deals with the functions and detailed operations of the materials and supplies department and is conducted by W. E. Scott, the official in charge of the stores department, and F. H. Tucker and L. A. Bansbach, his assistants. This is a practical course in the study of the methods used on a street railway property. During the course visits to the various storerooms are made. It is given in twenty weekly evening sessions and is attended by 67 employees, most of whom are connected directly or indirectly with the stores department.

Practical problems involving the fundamental principles of mechanical drawing and technical sketching are given in "Blueprint Reading," aimed to develop ability to understand shop drawings and blueprints. It is built around actual problems covering twenty weekly evening sessions, and is attended by 50 men. The course is under the guidance of F. W. Warwick of the engineering department and a former instructor at Drexel Institute.

The problems of practical mathematics as they apply to industrial conditions are treated in the course "Mathematics." The students whose company activities are similar are grouped together and practical problems are assigned for solution under individual instruction. Problems ranging from waybill calculations, change making and elementary shop arithmetic to levers, tackle blocks, power, strength of materials, cutting speeds and the use of the slide rule, are included. Three courses were held in this subject, the first being attended by 29 men and the last two by 40 men. Two mechanical engineers, R. O. Bowlby and L. Farnham, both occupying positions involving the practical use of mathematics, act as instructors.

"Fundamentals of Electricity" is a basic course for a street railway company, covering both theory and practice. Elementary principles of electricity, such as Ohm's Law, series and parallel circuits, power and magnetism are presented without algebra. Numerous problems are assigned for solution outside the classroom and individual instruction is arranged for when needed. This course was attended by twenty men, under the instructorship of H. D. Baker, a graduate electrical engineer.

Stenography Courses Develop Secretaries With Knowledge of Industry

Four classes in stenography were held at various locations throughout the system, the class hours being arranged to meet the convenience of those taking the course. Instruction is given by E. C. Hardy, a former member of the stenographic division, who, through his experience, is able to make it entirely practical and adaptable to the needs of the organization. The success of these courses has formed the nucleus of a complete secretarial course which is under preparation and which is intended to develop secretaries equipped with a practical knowledge of the city transportation business. The total enrollment for the four courses was 75.

Public speaking, a subject which has always proven a popular one in industrial educational programs, has been given to four distinct groups, limited in order that each individual may have frequent opportunity to develop his own abilities as a speaker. Ease of manner, freedom from self-consciousness while standing on the feet and addressing an audience and the ability to "think aloud" are aimed at, rather than oratorical perfection. Practice is given in informal debate and elementary parliamentary procedure. Outside reading of texts on public speaking is recommended and a moderate amount of outside preparation, in advance of class meetings, is required. Subjects of interest to all are selected for discussion, and a formal debate between picked teams representing the classes, at which three company officials act as judges, is held at the termination of the course. This course is taught by E. F. Thayer, publicity manager of the company.

The employees completing the course may become the members of a speakers' bureau to be used in addressing schools, clubs, etc., in connection with safety campaigns and on similar occasions.

Interest in Self-Improvement Stimulated

A unique course, "Opportunities," consisted of six evening talks on the opportunities which exist in the company and how one may prepare himself for them. One or more department heads were present at each session to describe a few of the specific jobs in their departments, outlining plainly their disadvantages as well as their advantages, and the requisites for promotion to these jobs as well as the qualities for success. After the positions and promotional channels were described in detail, anyone present had the privilege of asking specific questions. The course not only had a tendency to clarify the minds of the ambitious but had a decided effect in instilling a greater interest in self-improvement. The attendance at these classes averaged 152.

Through the company policy of encouraging customer-ownership, all of the employees are, from time to time, entrusted with the responsibility of selling the securities of their company to the car-riding public. Not only to equip them to explain intelligently the various issues, but to guide them in their own personal investment program, a course known as "Securities" was developed under the guidance of C. E. Ebert, comptroller of Mitten Bank Securities Corporation.

Informal discussion groups limited to those of supervisory rank only, are held in the various departments and are in most cases attended by almost the entire eligible personnel. The purpose of these groups is to develop a better understanding of the responsibilities of the supervisors and to discuss current supervisory problems. A few typical subjects taken up by the transportation department group include courtesy, discipline, relations between supervisors and trainmen and the best method of cutting cars when there has been a delay. The roadway group discussed such subjects as welding, blueprints and the basic facts of accounting as it affects construction and maintenance. The general offices group interests itself in accounting and financial items, such as

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budgetary control, the car-rider collections for stock and materials manufactured in the shops.

Library Assists in Educational Work

Reading lists have been prepared by the Library and offered in conjunction with each course. Books and periodicals which have a bearing on the text of the courses are arranged in a convenient sequence and are dispatched in rotation through company mail to those employees enrolled. In addition, a monthly bulletin is issued announcing the new books which have been purchased by the Library and articles appearing in current publications which have a bearing on any of the problems. Through a very convenient method, these as well as the other facilities of the unusually complete library are made available to all employees.

Because of the keen interest in analysis of statistical data, budget forecasts, economic prediction, etc., a series of ten leaflets dealing with the subject have been prepared and are being distributed to a selected list of executives and department heads. They include the following:

Cross-Section Statistics—These Mysterious Variables; Averages and Other Liars; Deviations Differ; When Two Variables Join Hands, and On How Many Cases Was the Conclusion Based?

Time Series—As the Seasons Change; That Business Cycle; Underlying Trends; Analysis of Graphs, and What is an Index Number?

Problems are contained in each leaflet and considerable interest is taken in working them out. With this series, the educational program is complete in that there are features available to all, spanning the organization from the laborer to the executive.

Performance of Trainmen Analyzed in Milwaukee

Ratings of motormen have been worked out so that follow-up instruction can be given intelligently

MOTORMAN selection tests have been used by the Milwaukee Electric Railway & Light Company for more than five years. Proper grading methods have been sought to record accurately the individual trainmen's ability and to determine what future instruction may be needed by him. The problem has been specific classification of performance for rating purposes that would be sufficiently simple in character to eliminate errors of personal opinion or other factors.

Until recently each new motorman in service was carefully followed up as soon as he had completed his training with the special platform instructors. An instructor rode with the motorman, usually for an hour. On a rating sheet he recorded the time of boarding and of leaving the car, and grades for operation, safety, service, and responsibility of the car operator.

The motorman was given a numerical rating ranging from 1 to 5 on each item listed. The values were: 1, excellent; 2, good; 3, average; 4, poor; 5, very poor. The grade card served as a guide to the instructor suggesting items that were to be particularly checked. It was found, however, that there was considerable difference in the estimates of the various graders. Obviously, some instructors were more easily satisfied than others. It became evident that further definition was necessary. Having specified the items to be graded, the next step was to specify the values to be attached the grades.

Present Plan of Rating

According to the revised plan of rating, the terms "excellent," "good," etc., have been dispensed with, and in their place a booklet has been compiled in which each grade of performance is described in detail, "A" stands for perfect performance all the time, "C" for errors of minor nature repeatedly made, and "E" for serious errors repeatedly made. Scoring now depends on two things: (1) Familiarity of the instructors with what constitutes "standard practice"; (2) ability to observe quickly. Personal judgment is reduced to a minimum. Instructors are being trained along the two lines indicated rather than attempting to standardize their conceptions of "excellent" or "poor."

In order to test out the system six instructors were requested to ride with the same motorman at the same time for a period of an hour and to rate him. The motorman knew he was going to be observed, but inasmuch as the rating was designed to check the uniformity of the instructors' gradings the quality of his work played no part in the results.

Several differences resulted in the grades given, which may have been in part because there were so many instructors on the car that some were in a better position for observing than others. Discussing the causes of these differences, it was found that some of the graders gave a motorman a "C" if he slipped just once on any item. Others were inclined to grade "A" unless the motorman showed that the error was habitual. They felt that if, for example, during some 75 starts and stops, there were only, say, two instances of roughness, the greater stress should be laid on the 73 smooth ones. In consequence intermediate grades "B" and "D" have been introduced. Grade "B" refers to making only once, an error of category "C." Grade "D" refers to errors of class "E" made only once. Each error is described in detail in the instruction book which the instructor carries with him as a reference and which also is given to every trainman so that he will know why and how he is being graded.

This method of rating, then, not only serves to define the classifications of performance for the instructors, but it quickly brings to light their grading judgment. Since each "C" or "E" must also be accompanied by the number indicating the rule which has been broken by the motorman, it can readily be seen which of the instructors are the most observant. In this way it is hoped to better the uniformity of grading and its consequent accuracy.

The form of instructor's report now used includes seventeen items, grouped under four heads, as follows: Operation—(1) starts; (2) stops; (3) schedules; (4) fares. Safety—(5) loading and unloading; (6) following up passing vehicles; (7) warning signal; (8) recognizing danger; (9) attention; (10) action in an emergency. Service—(11) watching for passengers; (12) attitude toward passengers; (13) announcements; (14) information. Responsibility—(15) attitude toward job; (16) following instructions; (17) neatness.

If it is necessary, an order for follow-up is issued. This is made on a form with blanks for the man's division, time of entering the service, past record, reason for follow-up, suggestions for special training, and report of the training division.

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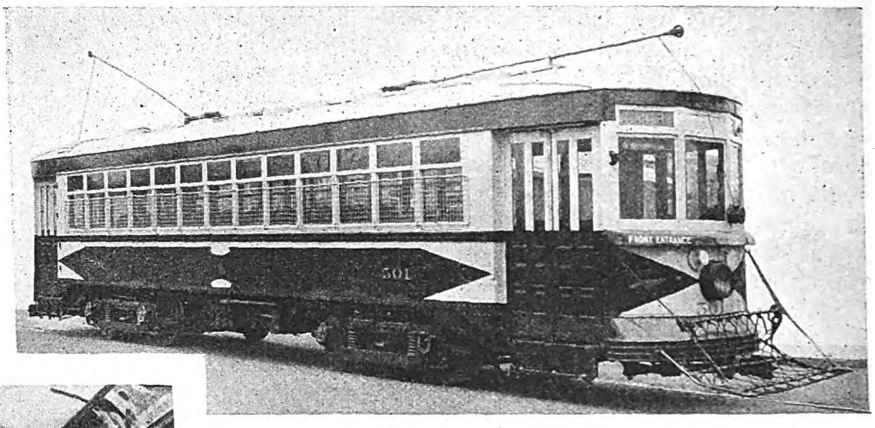
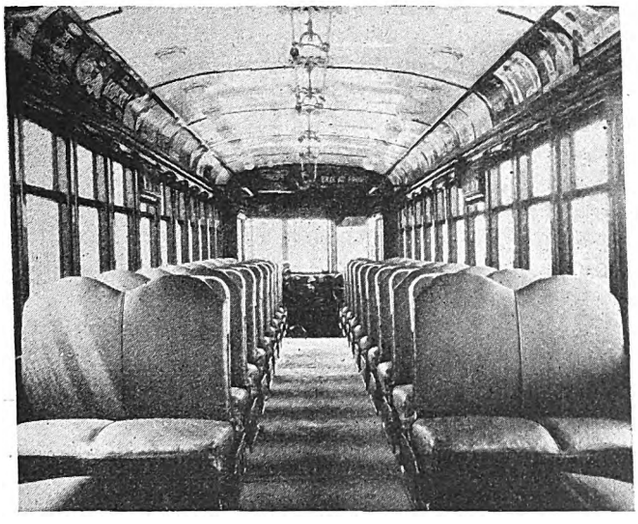
Interurban Cars of Delaware Company Rehabilitated

TWENTY-TWO interurban cars of the Southern Pennsylvania Traction Company, Wilmington, Del., are being remodeled in the company's shops at Wilmington, at an approximate cost of $58,000. The cars are 46 ft. long, have a seating capacity of 52 passengers and are equipped with four GE-247 motors and PC control. The cars are being completed on a schedule of one per week, and are going in service as received.



Car exteriors are finished in cream, orange and green with dark red stripping and an aluminum gray roof. Note the arrow effect on the side panel and the sunburst effect on the front dash



Deep cushioned leather seats were mounted on the old seat frames and new dome fixtures substituted for the old lighting system

The revamped cars have been equipped with the latest type safety devices for one-man operation, including brake interlocks and floodlights over door openings. To assist in fare collection, Ohmer registers of the fourteen-bank type have been installed.

Riding comfort has been enhanced by leather upholstered, semi-divided, deep cushioned seats designed by the railway and manufactured by the J. G. Brill Company. The leather cushions and backs were mounted on the original seat frames. The interior appearance has been improved further by laying Flexolith flooring and replacing the old-style lighting system with up-to-date Ivanhoe dome fixtures, one above each seat. The fixtures use gas-filled lamps with compensating resistances. Hand straps have been discarded and straight grab rails substituted.

The interior of the car is finished in dark mahogany, while the exterior is finished in cream, orange and green with dark red striping, and an aluminum gray roof. The side panel gives an arrow effect in orange against a cream background. On the dash a sunburst effect is carried out. This color scheme is not only attractive but makes the cars much more visible in traffic. To carry out further this dual effect the cars were equipped with dash floodlights for night use.

Not only have new seats, lights and all latest safety devices been installed to add to the safety and comfort of the riding public, but also all truck, motor and control equipment has been rebuilt, eliminating unnecessary noise.

Fewer Delays in Baltimore Caused by Trains

DECREASE in delays caused to cars of the United Railways & Electric Company, Baltimore, Md., by steam train blockades at grade crossings in the city during the first three months of this year was marked. A report compiled by H. Carl Wolf, chief engineer of the Maryland Public Service Commission, from reports made to the commission by the conductors of the United, shows that during the first three months of this year three railroads caused delays totaling 4,159 minutes. During the corresponding period of 1927 the delays totaled 6,769 minutes. Delays caused by the Baltimore & Ohio Railroad decreased from 4,429 minutes in 1927 to 1,694 minutes in 1928.

Advertising Prizes Awarded

Georgia Power Company wins first place for electric railways. Portland, Ore., and Twin City companies also honored

IN A nationwide advertising contest conducted among the utilities of the country, the Georgia Power Company, Atlanta, Ga., won first place in the electric transportation division. Second place was won by the Portland Electric Power Company, Portland, Ore., and third place by the Twin City Rapid Transit Company, Minneapolis, Minn. The announcement of these awards was made by Irving M. Tuteur of Chicago, chairman of the better copy committee of the Public Utilities Advertising Association, at the International Advertising Convention in Detroit, at the July 10 session. Presentation of the certificates of award was made by Donald M. Mackie of Jackson, Mich., president of the Public Utilities Advertising Association, acting in co-operation with representatives of the national utility associations.

The accompanying illustrations show the winning advertisements of the electric transportation division and the certificate of award presented jointly by the Public Utilities Association and the American Electric Railway Association.

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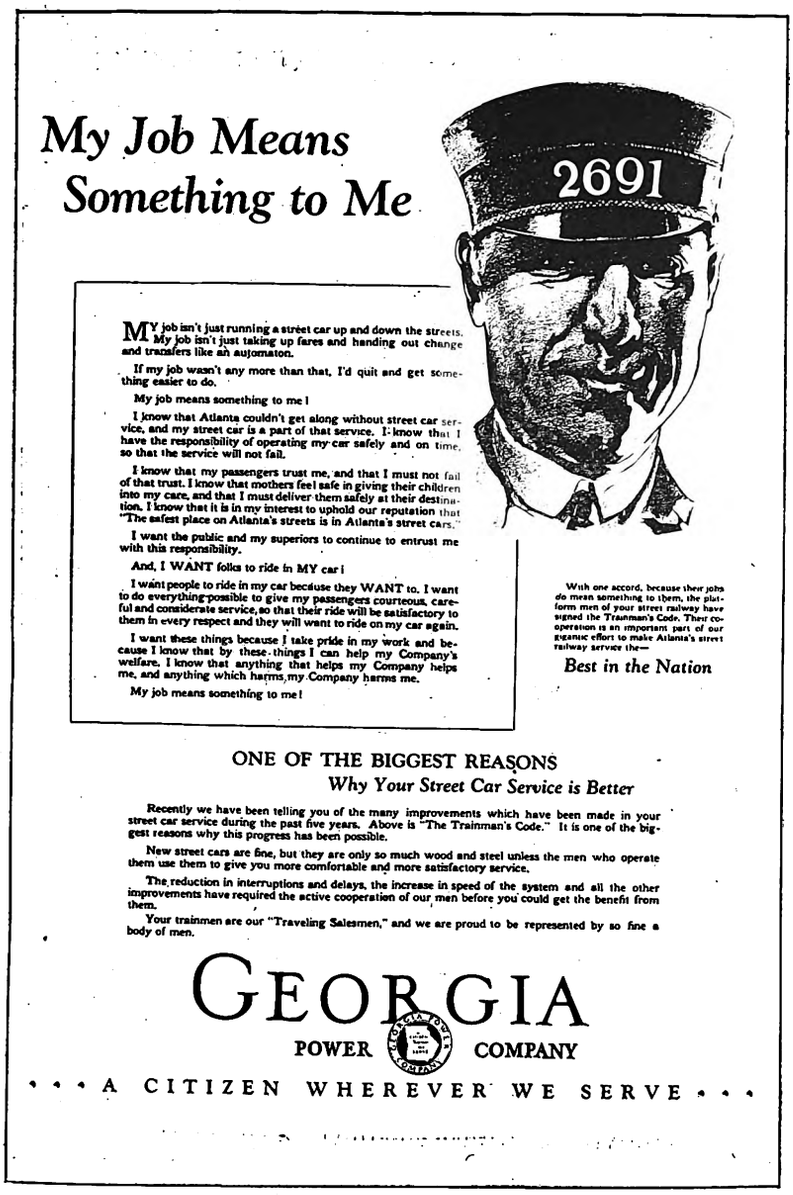

The contest had for its purpose improving the standard of public utility advertising appearing in the 26,000 newspapers in the United States. Newspaper advertisements captured all the winning places. The contest was conducted for advertising in three separate divisions: Electric light and power, gas, electric railway, and bus transportation. The joint co-operation of the National Electric Light Association, American Gas Association, and the American Electric Railway Association was extended in their respective fields of operation. More than 4,000 entries were received from several hundred public utilities. Entries were also received from utility companies operating in Canada, New Zealand and Australia.

All the prize-winning advertisements appear in the new 1928 edition of the "Better Copy Portfolio," together with some 600 other advertisements submitted by public utilities in the United States and Canada. This portfolio, an elaborate book prepared by the association, was presented for its first public showing at the convention and was distributed to utilities in all parts of the country.

First place in the electric division went to the Edison Electric Illuminating Company, Boston, Mass.; second place to the Virginia Electric & Power Company, Richmond, Va.; third place to the New Orleans Public Service, Inc., New Orleans, La. In the gas division first place was awarded to the Equitable Gas Company of Pittsburgh, Pa.; second place to the Union Gas & Electric Company, Cincinnati, Ohio; third place to the Lone Star Gas Company of Dallas, Texas.

The newspaper advertising reproduced was selected for awards in the Public Utilities Advertising Association contest. Below is a facsimile of the certificate presented the Georgia Power Co.

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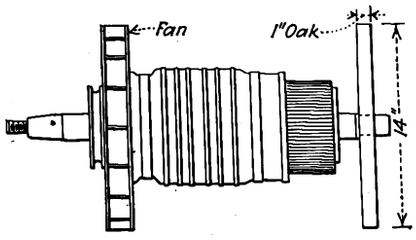
Maintenance Methods *and* Devices

Round Block Support Protects Commutator

FLOOR space is limited in the shop of the Manhattan & Queens Traction Corporation, Long Island City, N. Y. It is impracticable to erect suitable racks for the storage of repaired and defective armatures. As a result they are stored in an aisle along the wall of the building. This manner of storage resulted in damage to commutators until a method was devised to keep the commutators from coming in contact with the floor. This device is shown in the accompanying sketch. It consists of a piece of round oak bored to fit over the shaft. The outside diameter of this block is the same as that of the armature ventilating fan. Since this idea was adopted no commutators have been damaged.



Wooden disk support for armature keeps commutator off floor

Improved Method of Varnishing Car Beading

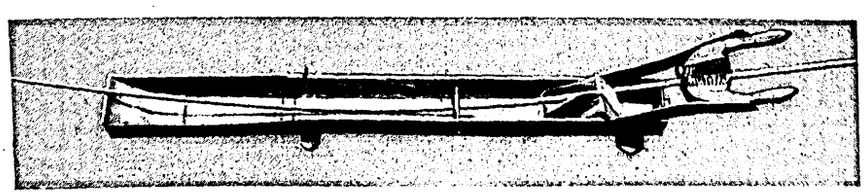
By F. A. Comine

Omaha & Council Bluffs Street Railway, Omaha, Neb.

TWO men, using a car beading varnishing-trough designed by D. L. Pattison, master painter of the Omaha & Council Bluffs Street Railway, Omaha, Neb., can turn out the same amount of work in a day as eight men using brushes. There is not only a great saving in labor, but the work is much more satisfactory, the varnish being distributed more evenly over the surface of the beading.

The trough, which is constructed of galvanized iron, is 44 in. long, 4 in. wide and 2½ in. deep, and holds 1¼ gal. of varnish. Two reversible furniture rubbing brushes are fastened in a frame at one end of the trough and are held together by a coil spring 3⅛ in. long. The beading is pulled between these two brushes as it leaves the trough so that all excess varnish is removed and all surfaces of the beading are covered. Twenty inches from the end of the trough and 1 in. from its bottom there is a loose roller that acts as a slide to keep the varnish from splashing when the beading is moving through. A guide near the brushes assists in keeping the beading centered with respect to the two brushes.

Two men use the outfit in varnishing beading. One man pushes the beading into the varnish bath and another pulls it through and lays it on a rack to dry.

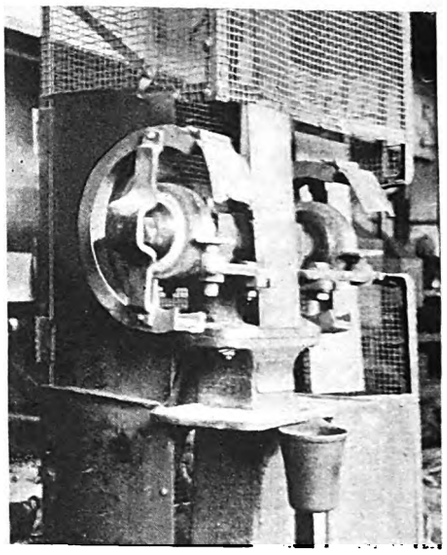


With this varnish trough car beading can be finished in much less time and with more thoroughness

Emery Wheel Guard and Visor

PROTECTION of shop employees from the revolving emery wheel and their eyes from flying particles of emery has been obtained in the shops of the New York & Harlem Railroad, New York City, by development of the guard and transparent visor illustrated. The circular portion of this guard is made of two pieces of 1¼-in. angle riveted to a ⅛x1¼-in. plate and is fastened to the base of the machine by rigid brackets. The emery wheel shaft nut is guarded by a ⅜x2¾-in. bracket shaped so as to prevent entanglement and riveted to the circular guard. The visor is fastened to the top of the circular guard and drops downward so as to stop any flying particles of emery.

The framework is made of brass and is hinged. Both of the vertical edges of this visor are turned over so as to form grooves for the insertion or removal of the transparent medium. Mica is used for this since it was determined that it has a longer life and offers better protection to the operator than other materials. Eye accidents have almost become extinct since this visor has been in service.



Guard and visor protect workmen at emery wheel

Spacing Brush-Holders from Commutator

By John S. Dean

Renewal Parts Engineer Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

IT IS quite generally accepted that some of the side wear of railway motor carbon brushes is due to having the brush-holders spaced too far away from the commutator. Too great spacing also is responsible for some of the chipping and breaking of the carbons caused by unusual vibration. Experience at the Westinghouse factory with new motors, and on the road with repaired and overhauled motors, has resulted in selecting ⅛ in. as the most suitable distance to space the brush-holders from the commutator. On all assembled motors going through railway repair shops this spacing should be checked by means of a wooden wedge with $\frac{1}{10}$-in. steps marked on its side.

When it is necessary to adjust the brush-holder spacing a gage of hard fiber ⅛ in. thick, placed between the carbon box and the commutator, can be used to advantage to insure its proper setting.

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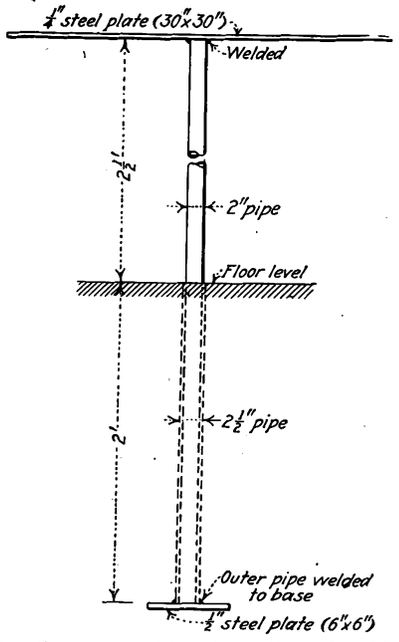
Revolving Work Table

SERVICEABLE revolving work tables have been made in the shops of the Steubenville, East Liverpool & Beaver Valley Traction Company from scrap parts, as shown in the sketch. This particular table was made up from a 30 x 30-in. sheet of ¼-in. sheet steel, 4 ft. 6 in. of 2-in. pipe, 2 ft. of 2½-in. pipe, and a ½-in. steel plate 6 in. square. When assembled by welding, as indicated, a

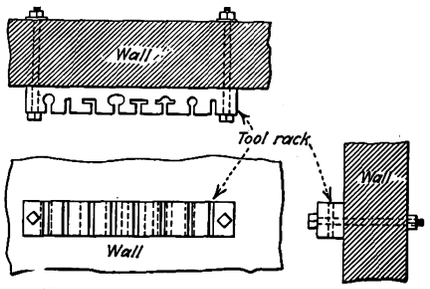


Details of assembly of small work table

handy small revolving table was formed for use in either the blacksmith shop, machine shop, welding shop, or any part of the mechanical department where the heavy pieces of equipment are handled.

Centralization of Tools

CONSIDERABLE time usually is wasted where the tools are not taken care of systematically, and the men find it necessary to look for a tool to perform a certain piece of work. To overcome this waste, tools in the shop of the Jamaica Central Railways, Jamaica, N. Y., are now centralized. This has been accomplished by installing a suitable tool rack near the center of the overhauling department. The rack is designed to accommodate all of the tools needed for a certain overhauling process. It consists of a 2x4-in. beam bolted to the wall. This beam is cut and notched to provide a space for each tool. Each tool is returned to this rack when it is not in use, and at the end of work each day it is a very simple matter for the foreman quickly to make a check and determine which tools are missing and who is responsible.



Tool rack used in shop of Jamaica Central Railways

Adoption of this idea has resulted in a decided improvement in discipline and production.

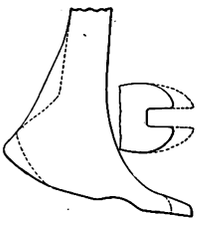
Claw Bar Designed Scientifically

CREWS of the Chicago, North Shore & Milwaukee Railroad track department have developed a 30-lb. claw bar which has served their purposes very well. It was difficult with the prevailing types of claw bars to pull spikes without bending them. With the ordinary type of claw bar, such as indicated by the solid line in the accompanying illustration, the radius of the arc through which the claw passed in withdrawing a track spike was so great that it was next to impossible to prevent severe bending. The excessive depth of the recess or groove in the claw further aggravated the bending by putting most of the pressure in pulling under the far side of the spike head.

In the redesigned bar the depth of the claw was reduced fully one-half and the heel reshaped in such a way as to shorten the arc through which the spike had to be drawn in removing it from the tie. Reduction of the depth of the claw accomplished an almost uniform distribution of pressure under the spike head throughout the entire distance of its travel in being pulled from the tie.

New type of claw bar used on North Shore Line

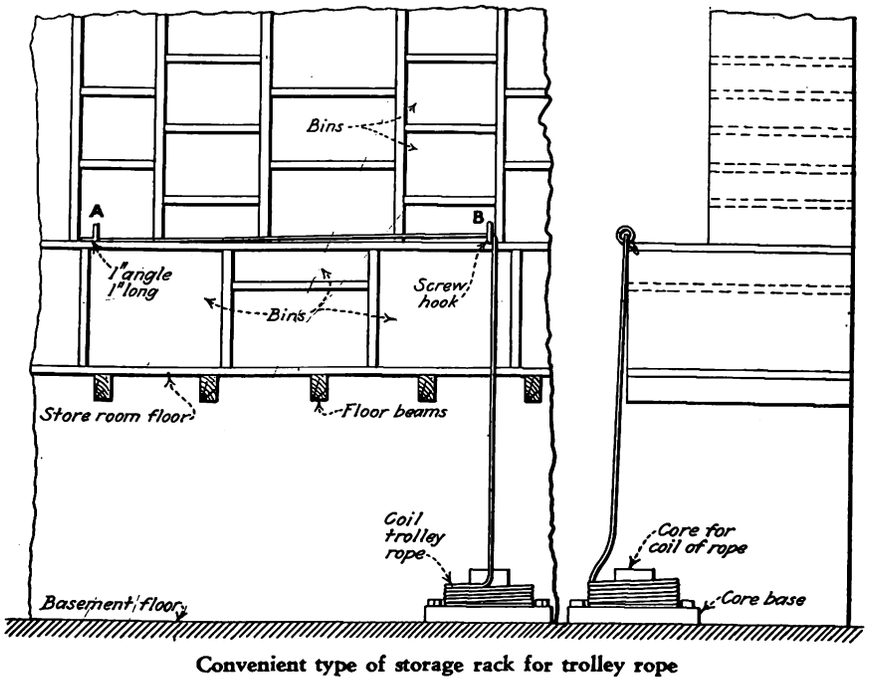
The dotted lines indicate the alterations which were made to the heel of the claw bar to improve its performance. The claw was reduced in depth by one half to eliminate pressure on the far edge of spike head.



So completely successful has been this design that on the North Shore property all of the track crews are being supplied with the revamped claw bars. Work is materially speeded up because less care has to be exercised in pulling the spikes now that the bending has been obviated and because no additional time need be spent in straightening the spikes after their removal.

Handling Trolley Rope in Storeroom

FLOOR space is of prime importance in the shop storeroom of the Richmond Railways, Inc., Staten Island, N. Y. Here all material is arranged conveniently and the storage receptacles are so designed as to occupy a minimum of space. It was found that a coil of trolley rope occupied considerable floor space and



Convenient type of storage rack for trolley rope

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that delay was occurring in filling orders due to measurement of each piece with a ruler, and to kinking of the rope.

A novel scheme was devised to prevent kinking and at the same time to simplify the method of determining the standard length. The coil of rope is placed over the core of a wooden reel on the basement floor. The end of the rope is taken to the storeroom through a hole in the floor and fastened to the screw-eye at *B*. When an order is received for a standard length the end of the rope is pulled to *A* and then a cut is made at *B*. The small angle at *A* and the eyebolt at *B* are permanently spaced to correspond to a standard length.

This idea has released storeroom floor space for other material and eliminated the delay caused by measuring each length by a ruler or tape line.

New Equipment Available

New Bus Body

SPACIOUSNESS without clumsiness and awkwardness in appearance is given as a feature of the new 240-in. wheelbase, 33-passenger, city pay-enter type bus body introduced by the Bender Body Company,

Interior of the new Bender body

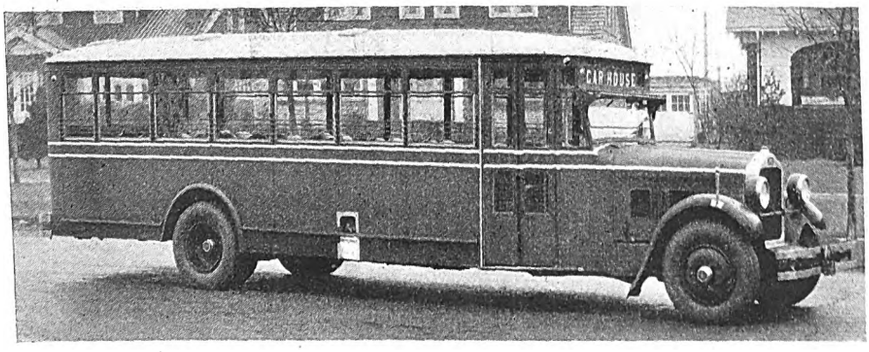
Cleveland, Ohio. Strucural work of the body is of best grade seasoned white ash, primed with oil. All pillars are mortised and tenoned in roof rail and floor sills, and reinforced with steel stays fastened to roof rail, belt rail and floor sill. The front of the body is braced with Bender patent composition metal construction, attached to roof and body framing.

The interior is lined with metal panels and mouldings, except the roof lining, which is of laminated panels. The inside curved corners are moulded for standard-sized advertising cards. The floor covering is of linoleum.

The roof is a separate unit, mortised, tenoned, glued and screwed to body pillars. It is reinforced at the crossbows and body pillars with steel stays. The outer curved corners are covered with sheet metal, and laminated wood panels form the deck. The roof is covered with heavy waterproofed duck, drawn taut and fastened under the gutter drip moulding and painted. The door operating mechanism is of a ball-bearing type, locking the door open or closed. There is an emergency door at the left side rear or center of rear, as specified in accordance with local laws or regulations. This door is usually of the coach type without outside handle, but if on the side has a lever handle on the inside with safety latch. If the emergency door is at the center of the back a three-way lock with lever handle and safety catch is used.

Seats are Bender's own make with skeleton or oval type pedestals. The driver's seat is of the adjustable bucket type. The rear seat extends full width of the body, and accommodates five passengers. Other seat plans are optional. All seat cushions and backs are upholstered in leather. Cushions are made on frames as separate units and may be removed easily. All upholstering is smooth, without pleats. The general equipment includes the fololwing:

Dome lamps..Closed type, opaque reflectors
Step light.....At entrance
Signal buzzer.....Pull cord type
Windshield wiper .....Automatic
Rear vision mirror.....Standard
Stop signal..In rear panel over license plate
License plate holder in rear.....Standard
Roof marker lights.....Standard
Heater.....Bender floor pipes
Ventilators.....In roof and cowl
Destination sign....Bender type, Hunter illuminated
Spare tire carrier.....At rear or left front
Window guards.....At each window hinge
Rear bumper.....G-G spring type
Hand rods.....Door, driver's seat and roof
Painting.....Bender standard system of Duco, colors optional
Sash....Nickeled brass with safety latches
Windshields..One piece, sloping stationary
Sun visor.....Over windshield



One of the new 240-in. wheelbase Bender bus bodies

Clamp For Driving Ground Rod

WHEN driving a ground rod at a pole, it is sometimes quite difficult for the workman to hold the rod and wield the sledge hammer necessary for driving. This difficulty has been overcome by the linemen on one property, as shown in the accompanying illustration. Here the lineman is driving a ⅝-in. Copperweld ground rod, which is supported so as to enable him to use both hands. The holding device consists of a wooden block 4x4x2 in., into which a 2-in. staple has been driven. A 4-ft. strap taken from a worn-out belt harness fastens the block with staple to the pole.

Clamp for ground rod so that workman can use both hands

In driving the rod the lineman slips the staple over it and then straps the tackle to the pole. This holds the rod upright and prevents it being driven at an angle.

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Association Activities

American Standards Association to Succeed A.E.S.C.

Former body reorganized and enlarged to meet the growing needs of the industry. Procedure will be more flexible

RECONSTRUCTION of the American Engineering Standards Committee to keep pace with the growth of the industrial standardization movement in the United States is now under way, according to an announcement by the committee. The principal features of the reconstruction are the definite federation of national organizations, under the name American Standards Association, in such a way that trade associations interested in standardization may more readily join in the direction of the movement; placing the technical work of approving standards in a standards council; and concentrating administrative and financial responsibility in a board of directors composed of twelve industrial executives.

The reorganization has been unanimously approved by the main committee of the A.E.S.C., and is now being voted upon by the member-bodies. The action of the committee results from more than a year's intensive consideration of the subject by the main committee and rules committee. The latter was enlarged for the purpose to include a representative of each of the nineteen member-bodies desiring representation.

In submitting the plan for the formal approval of the member-bodies, William J. Serrill, chairman of the committee, states:

"The ten years' experience of the committee has brought to light certain fundamental difficulties inherent in the old organization. It is the purpose of the reorganization to eliminate these difficulties, to place the operation of the committee on a sound administrative basis, and to facilitate the financing of the work on an adequate scale."

Among the conditions which led to the reorganization are the growth of the trade association movement, together with the predominating position which the trade association is coming to have in the field of industrial standardization, and the increasingly important direct part which the plant executive is playing in the standardization activities within his plant and in the movement as a whole. Recognition of this latter is reflected in the make-up of the board of directors which will control the general administrative and financial affairs of the association. The industrial executives composing this board will be elected, for three years, on nomination of member-bodies.

"Approval of standards and matters of procedure will be in the hands of a standards council. The council will be composed of not more than three representatives of each of the member-bodies, the councillors also serving for a period of three years.

"The underlying principles of the A.E.S.C. remain unchanged," Mr. Serrill adds. "The basic functions remain completely in the hands of the representatives of the member-bodies. The individual members, whether of the board of directors or of the Standards Council, are appointed or nominated by the member-bodies, which thus remain the fundamental units in the organization.

"The name American Standards Association is being adopted as more accurately descriptive of the reorganized association, and also because of the misunderstandings and misconceptions which have frequently occurred in connection with the words 'engineering' and 'committee.' The scope of the work is, however, being limited to those fields in which engineering methods apply."

The objects of the association, as stated in the new constitution, will be: to provide systematic means by which organizations engaged in industrial standardization work may co-operate in establishing American standards in those fields in which engineering methods apply, thus avoiding duplication of work and the promulgation of conflicting standards; to serve as a clearing house for information on standardization work in the United States and foreign countries; to further the industrial standardization movement as a means of advancing the national economy, and to promote a knowledge of, and the use of, approved American industrial and engineering standards, both in the United States and in foreign countries; and to act as the authoritative channel in international co-operation in standardization work, except in those fields adequately provided for by existing international organizations.

The revised procedure of the committee, which forms a part of the general reorganization, and in which there is much more flexibility than formerly, is already in effect. Under the new procedure, a sectional committee may operate autonomously, reporting directly to the A.E.S.C., or it may act under a sponsor as heretofore. "Proprietary" standards are recognized and may be revised within a single organization on condition that it be shown that the standard is acceptable to the groups concerned—a method particularly applicable to highly specialized fields. In very simple cases, approval is based upon the action of a conference followed by written acceptances of the interested groups.

Southern Equipment Men's Program for Cincinnati Meeting

ANNOUNCEMENT has just been made of the following program for the Cincinnati-Covington meeting of the Electric Railway Association of Equipment Men, Southern Properties, to be held in the Hotel Gibson, Cincinnati, Ohio, July 25-27:

WEDNESDAY, JULY 25

9 A.M.

Registration.

Address of welcome, Clarence O. Sherrill, City Manager, Cincinnati, Ohio.

Address of president.

Reports of committees.

Indorsement of membership applications.

"Evolution of the Master Mechanic," by M. B. Lambert, transportation sales manager Westinghouse Electric & Manufacturing Company, New York, N. Y.

"Co-ordinating Shop Equipment and Man Power," by E. J. Jonas, superintendent of equipment Cincinnati Street Railway, Cincinnati, Ohio.

"Application of Carbon Brushes in Electric Railway Service," by A. Broggini, advertising manager National Carbon Company, Cleveland, Ohio.

2 P.M.

"What Are You Doing to Meet Competition?" by E. P. Waller, manager railway department General Electric Company, Schenectady, N. Y.

"Testing Cars for Performance," by W. A. Keller, Pittsburgh Railways, Pittsburgh, Pa.

"The Articulated Car," by A. T. Clark, superintendent rolling stock and shops United Railways & Electric Company, Baltimore, Md.

"The Bus in Urban Transportation," by V. W. Berry, assistant general manager Virginia Electric & Power Company, Richmond, Va.

"Modernizing Equipment," by R. L. Wommack, superintendent Southern Public Utilities Company, Charlotte, N. C.

"Bus Maintenance," by L. McInerny, master mechanic San Antonio Public Service Company, San Antonio, Tex.

"Centralized Control of Emergency Service," by Joe R. Ong, transportation engineer Cincinnati Street Railway, Cincinnati, Ohio.

The Thursday morning session will open at 9 o'clock and the entire day will be devoted to discussion of questions submitted. These discussions will be continued until 10:30, after which the delegates will inspect the shops of the Cincinnati Street Railway and the Cin-

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cinnati, Newport & Covington Railway. A banquet will be given in the Hotel Gibson ballroom on Thursday evening at 7:30.

Reducing Insurance Costs

OF INTEREST to electric railway operators was an article entitled "Reducing Insurance Costs," by Charles B. Scott, president Bureau of Safety, Chicago, read before the recent N.E.L.A. convention at Atlantic City.

Mr. Scott pointed out that the average railway executive is reluctant to tackle the problem of reducing insurance expense due to a mistaken notion that the questions involved are too complicated and technical, and the rates, once established, cannot be lowered except by some costly process of construction or alteration of property. While admitting that the subject is by no means an easy one, he proceeds to point out the simple means of reducing costs that are within the understanding of anyone of average intelligence and that can be accomplished with little expense other than attention to details in certain departments of operation. Among the items indicated as being comparatively easy of solution are structural changes in physical properties which have been recommended by qualifying insurance brokers or engineers, a proper classification of payroll where casualty insurance is carried, and an insistance upon the systematic planning of fire prevention work among employees, which is bound to be reflected ultimately in the company's loss experience. Mr. Scott also points out the considerable saving made possible by a systematic study of the principles of co-insurance. A policy of fair dealing with injured employees is quite apt to be reflected in the attitude of all employees in the matter of claims against the company.

Energy Conservation on Electric Railways*

By L. E. Gould
President Economy Electric Devices Company, Chicago, Ill.

ELECTRICAL energy can be conserved by effecting changes in the physical equipment which will reduce the characteristic consumption of a given vehicle in a particular service over a certain route when operated by an average man, by increasing the operating efficiency of the trainmen, and by maintaining the equipment properly.

The characteristic energy consumption in kilowatt-hours per car-mile for an electric railway may often be reduced by a study of the possible redistribution of existing equipment. A few years ago one of the large interurban systems was able without any outlay to effect a substantial energy saving by switching certain car types from local to limited service, and others from limited to local service. Each road has its own situations which offer analogous opportunities.

Another saving possibility is lowering the voltage in the downtown section and raising it in the outlying sections. Still another possibility is the use of control rheostatic losses to furnish part of the car heating. Regenerative braking has been used by electrified railroads in mountainous districts, and some studies have been made in metropolitan districts. Substantial savings have been realized on one high-speed 1,500-volt metropolitan surface and subway system by partially replacing control resistances with heavy reactances.

Car friction offers an opportunity for reduction on most every property. Engineers of the United Railways & Electric Company of Baltimore, have made several bearing friction tests. Knowing the physical characteristics of the car under test, its initial acceleration, and with an accurate measure of the distance, the frictional losses in terms of kilowatt-hours per car-mile, with various bearings and oils, were calculated.

Tests were taken with cars equipped with watt-hour meters and the frictional losses with various bearings and oils were calculated. It was found that a characteristic reduction of more than 0.3 kw.-hr. per car-mile could be obtained by changes in brake adjustment, lubricating period and lubricants.

Other energy saving possibilities are limiting the operation to full series at certain times in certain districts, reducing the number and length of stops, and greasing the track curves.

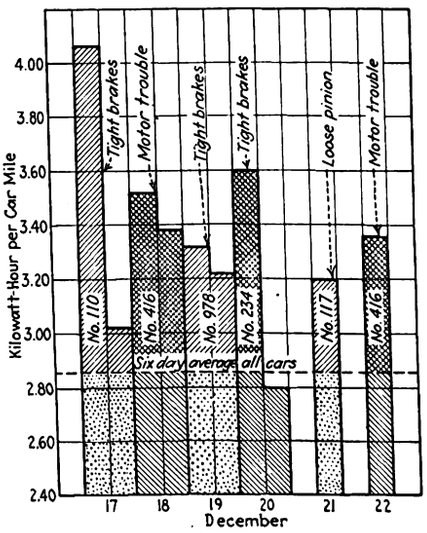

Chart showing the energy consumption of six cars for a period of six days. The plotted figures are helpful in car inspection work

The amount of saving that can be realized on any property depends on the men who are operating and caring for the cars. Better handling of the controller and brakes by trainmen who have the conservation of energy in mind while operating a car, produces results. Measuring devices for checking the individual trainmen have been installed on more than 200 electric railways. The devices have been helpful even on the road with highly trained men on the cars and in the shops. They provide a simple system of reporting individual performance and are stimuli which maintain the men's interest in more efficient operation. Also, through the records thus obtained, the supervisory force is enabled to learn which men require further coaching.

Maintenance Methods Important

Much of the success in any energy saving campaign depends on the maintenance methods, and the strict observance of chosen practices by the employees in the mechanical department. The watt-hour meter is helpful for the mechanical department for it shows the relative operating efficiency of the equipment.

An example of how road defects increase energy consumption is illustrated by the accompanying chart, which gives the kilowatt-hours per car-mile consumed by five similar cars on six succeeding days of service on a heavily traveled route of a metropolitan property. For test purposes, these cars were operated as nearly as possible by the same crews and every precaution taken to make the results comparable.

On Dec. 17, car 110 after inspection went into service with tight brakes, and used 4.06 kw.-hr. per car-mile for one run. The brakes were then adjusted and another test made. It used only 3.03 kw.-hr. per car-mile on the second run, a saving of 1.03 kw.-hr. for brake adjustment alone. On the eighteenth of the month car 416 showed very high readings and the motorman instructor was asked to operate it. He did so for two hours but could not get its consumption down to the average of the other cars. On inspection, the armature wrapping was found to be carbonized.

Car 234 came from inspection on Dec. 20 with very tight brakes. Adjustment was made and the energy consumption dropped from 3.60 to 2.80 kw.-hr. per car-mile with the same motorman.

Car 117 made the lowest record of the test on the afternoon of Dec. 20. On the afternoon of the next day it could not be operated at normal consumption and an inspection was made. A loose pinion was found to be the cause of the trouble.

The watt-hour meter provides car inspection dials for assisting the mechanical department in its routine inspection work. The dials indicate when a car has performed its predetermined amount of work and is ready to be inspected, oiled or put in the shop. It provides a convenient means for measuring the work done by the parts of a car that need inspection.

**Abstract of a paper presented before the Midwest Electric Railway Association Convention, held at Kansas City, Mo., June 4-6, 1928.*

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Building Good Will*

By B. J. Yungbluth,
President International Railway, Buffalo, N. Y.

IN THE face of the introduction of one-man cars, the inauguration of higher fares and deferred reconstruction of track and paving, it has not been easy to improve International Railway Company public relations. Six years ago typical newspaper headings were "Street car service scored by citizens," or "Mayor renews warfare on I.R.C." Today the same agencies praise I.R.C. men and management for the improvements made.

We have not satisfied everyone, and probably never will, but one of Buffalo's newspapers recently published an editorial congratulating I.R.C. upon its improved service, closing with the sentence, "This paper, that has criticized your service in the past, feels honored in saying a good word in view of your efforts to solve our transit problems." The latest letter received from the Mayor of Buffalo said, "Please accept my thanks for your usual consideration of my request and the prompt action."

Get-Together Meetings Grow

One of the most important factors, our get-together meetings, has been developed by the employees themselves. These meetings began in 1923 in the crews' rooms of the carhouses. A little entertainment was provided and short messages were delivered by a representative of the company. The first meeting was attended by eleven people. Gradually the attendance increased to a few dozens and then to a hundred. The employees began bringing their wives and their children and ultimately their friends. When the attendance exceeded the capacity of the carhouse crews' room, it was necessary to hire a theater. There were 2,000 in attendance at the first meeting in the theater and soon there was standing room only, so that we had to rent one of the largest auditoriums in the city, which has a seating capacity of 3,500. Last week the meeting was attended by 4,500 I.R.C. workers, relatives and friends.

The entertainment at these meetings is provided by I.R.C. musical organizations and by I.R.C. men who stage amateur acts. At no two meetings has the entertainment been the same. The men give their services not only for the rehearsals and for the entertainment, but for the operation of special cars from all points on the system. At the latest meeting more than 544 persons participated in the entertainment. More than half were women and children. The meetings are attended not only by the employees, but every department head and foreman.

The musical organizations were a gradual development for the purpose of promoting the get-together meetings. We started out with a few employees who were able to play a few elementary instruments.

First we built up a concert band which now numbers 58 men, all in full uniform. The men bought their own instruments. Then a kiltie band was started which now numbers fifteen, all in the native costume. Then rapidly there were developed a harmonica band, a girls' ukulele band, a trumpet and drum corps, an orchestra, a male chorus and a junior harmonica band of 86 boys under twelve years of age, sons of I.R.C. employees who made a public appearance and rendered five selections after ten hours of musical instruction by one of our own trainmen. The latest development is a junior orchestra of 44 girls under twelve years of age, daughters of I.R.C. employees, who produce music from bells, triangles, etc.

As a result of the appearance of these musical organizations at our get-together meetings, the company received requests for their appearance generally throughout the city, at church socials, fraternal organization meetings, luncheon clubs and in parades. They have been most enthusiastically received 68 times within the last six months. Last summer for the first time, the musical organizations gave in various parts of the city, free concerts in the parks. There were large audiences at each, but the record was broken at one of the parks on the south side where there had been least sympathy with the company. The audience there numbered 8,000 and was in excess of any audience at any public concert held in the city of Buffalo.

These get-together meetings are supplemented by informal talks on courtesy, neatness, etc., to smaller groups at the carhouses, and by a series of bulletins, illustrated in many cases by the employees themselves. Each emphasized the importance of some particular phase of courteous and efficient operation. So impressed are the men that they have begun to create their own posters on these subjects.

Frequent Talks with Men an Established Policy

The plan of going to the employees frankly, freely and frequently was productive of such splendid results that it naturally set up a basic policy to be followed in telling our story to the public in the interest of a fuller understanding. We established a public relations department at the head of which is a man of ability and long experience, who sits in the councils of the company and there represents the public, so that the company does not fail to consider the public angle in every move that it makes.

This man, then knowing the facts, is able to tell them to the newspapers. These statements are interestingly written and are cheerfully received and readily printed by the newspapers. Sometimes the papers themselves initiate a commendatory story, as for example, an article which appeared in the Buffalo *Evening News* recently, setting up the safety accomplishments of I.R.C. as a mark for the autoist to shoot at. I.R.C. had a 15 per cent reduction in accidents last year, and a 33 per cent reduction so far this year.

Dash signs on the front ends of our cars and ceiling signs inside the cars carry pertinent messages to the public. The company issues an official publication called *Service Talks*, containing company news and expressing the management viewpoint on questions of common interest to community and company.

To keep our fingers on the pulse of public thought regarding transportation, representatives of the company have joined business, civic and social organizations and actively participate in their meetings. We go farther than that. We grasp every opportunity, create them if necessary, to appear on the public platform and tell our story. On some of these occasions the musical organizations perform, assuring the speaker of an audience that is more than usually receptive. In these various ways, we tell our story frankly to the public. We

**Abstract of a paper presented at a meeting of the New York Electric Railway Association, Coney Island, N. Y., June 14-15.*

COMING MEETINGS OF *Electric Railway and Allied Associations*

***July 17-20*—American Society of Civil Engineers, annual convention, Buffalo, N. Y.**

***July 19-21*—Pacific Claim Agents' Association, annual convention, San Diego, Cal.**

***July 25-27*—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.**

***July 27-28*—Central Electric Railway Accountants' Association, Detroit, Mich.**

***Aug. 16-17*—Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.**

***Sept. 7*—Maryland Utilities Association, mid-year meeting, Braddock Hotel, Braddock Heights, Md.**

***Sept. 7-8*—Central Electric Traffic Association, Potawatomi Inn, Angola, Ind.**

SEPT. 22-28, 1928
American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

***Sept. 25*—Central Electric Railway Master Mechanics' Association, Cleveland, Ohio.**

***Oct. 1-5*—National Safety Council, annual safety congress, New York, N. Y.**

***Oct. 8-12*—American Welding Society, fall meeting, Philadelphia, Pa.**

***Nov. 14-15*—Public Utilities Association of Virginia, Roanoke, Va.**

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carefully avoid giving any promises that could not be kept and when promises are given, we are alert to arrange for their prompt execution.

We go to the extent of publicly inviting complaints, and then see that every one is analyzed and answered fully and promptly. In its offer to improve service and consider suggestions, the company said: "If it can be done, we'll do it; if it can't, we'll tell you why." When there is a reasonable opportunity a service representative calls upon the complainant. The usual result is that the person making the complaint is immeasurably pleased that so much attention is paid to his communication.

One of the most important factors contributing to the improved public relations has been the ability of the company to resume track and paving reconstruction. At the invitation of I.R.C., city officials and officers of local business associations participated in neighborhood celebrations when reconstruction work began. When each job was begun, the president of the local business association and the president of the company lifted the first stone. One enterprising merchant decorated the first brick from his street with a huge bow of blue ribbon and featured it in his window display. Maintenance work had been going on from year to year with little comment, but last season to impress the public with the extent of the work, signs were posted at every job undertaken reading, "Drive carefully, I.R.C. repairing tracks and paving." The knowledge that I.R.C. was busy on practically every street in the city was thus conveyed.

Buffalo's climate, as you know, makes snow fighting an expensive undertaking. Formerly the company cleared its track area only, but during the past two years I.R.C. has made improvements in snow-fighting equipment and the company now clears trolley streets from curb to curb at very little increase in cost. The new methods have stimulated a great deal of favorable comment, not only from motorists, but also from car riders, who find their service less subject to delay; and from city officials.

Such work as we have been able to do has been done, not through any spectacular, highly mysterious methods, but through the application of sound common sense to the public relations problem. Of course the public relations department is charged with responsibility for this work, but the results would not have been possible without the wholehearted co-operation of every department.

Advantages of Mercury Arc Rectifiers*

By M. L. de Angelis

Assistant Electrical Engineer Montreal Tramways, Montreal, Quebec, Canada

THERE is certainly no doubt that up to 750 volts, the modern 60-cycle rotary converter is a very efficient and reliable machine. However, even at its best it is a mechanical rectifier, necessitating a rotating armature with the inseparable current collecting devices which need continuous maintenance. Although the rectifier requires two small motors, one for the oil-sealed rotary pump and another for a cooling water pump, it is essentially a static machine and does not have the disadvantages of the moving type of machinery.

There are many other advantages of this type of apparatus, from an operating point of view. The weight of a rectifier, complete with its auxiliaries, is considerably less than that of a synchronous converter of the same rating. No vibration is set up by rectifiers, so that foundations required are simple and their cost is small. Also, because of the lighter weight, lighter hoisting apparatus is needed. By housing the transformers in an out-door compartment adjacent to the rectifier room, the substation building can be made simple and small. Generally speaking, the rectifier substation requires less floor space for the same capacity than does the rotary converter substation.

The rectifier substation emits two noises, the humming caused by the vibration of the transformer stampings and the noise of the small rotary pump for the preliminary vacuum. The rotary pump can be made very quiet by mounting it to prevent the transmission of any vibration to the building. Locating substations exactly where they are required, irrespective of the class of neighborhood, will result in large economies in feeder copper and distribution losses.

Abstract of a paper presented before the Canadian Electric Railway Association, Toronto, June 6-8, 1928.

Less Switching Equipment Needed

In a manual station the high-tension apparatus will be practically the same as for a synchronous converter installation. However, less starting equipment is needed for the rectifier because of the absence of switches or compensation on the low-tension side of the rectifier transformer, which must take care of relatively large currents. For automatic substations the equipment is somewhat simpler for the rectifier.

The ventilation problem for rectifier installations is easily solved and the station roof and sides can be made with relatively few openings for the ventilators or windows. However, the rectifiers require water cooling, which is a continuous expense and not so convenient as natural ventilation.

Reverting to the operating side of the mercury arc rectifier, there are five outstanding advantages:

1. Little attention is required during service due to absence of brushes, large oil-lubricating rings for bearings, flashovers on heavy shorts and field regulation.

2. The wear on the apparatus is almost negligible, and the maintenance charges are much lower than for rotating machines. Because of the little wear, there is a large reduction of dust on the equipment in general.

3. Rectifiers are free from desynchronizing forces and when the supply voltage or frequency undergo large variations, they are not affected therefrom and do not occasion a short circuit in the a.c. circuit as rotating machines do. Under such circumstances the valve action of the mercury vapor arc prevents return of current from the d.c. side and the rectifier simply drops the load.

4. Rectifiers behave in a most satisfactory manner during short circuits on the d.c. lines or very heavy momentary overloads. The only thing that may happen when the feeder breaker does not open sufficiently quickly is an arc-back in the rectifier with the consequence that protective equipment on the d.c. and a.c. circuits immediately disconnect the rectifier from the buses and the latter can be put back again in service just a few seconds afterward.

5. The outstanding electrical characteristic of the mercury arc rectifier is its efficiency, which remains nearly constant at all loads and which is due to the drop in the arc being approximately uniform under all loads and pressure conditions. The commercial efficiency of a unit, including the transformer and auxiliary apparatus, does not remain constant, but falls below ¼ load. However, from ¼ up to 1½ full load, the over-all efficiency varies between 92 and 94 per cent. The higher efficiencies of the rectifier at low voltage are very interesting for traction work because the machines are not fully loaded during an aggregate of some twelve hours each day and, therefore, the total daily energy losses are lower than if rotary converters were used.

Limitations of the Rectifier

The rectifier has, of course, its limitations. For one thing, it is not possible to adjust the power factor of a rectifier. It varies from 90 to 96 per cent lagging and it is due to two separate causes, the distortion of the current wave which is not purely sinusoidal and the displacement of the fundamental harmonic of this wave relative to the pressure wave. Even in rotary converter substations it is very difficult, if not impossible, to keep the power factor at unity, and it is quite reasonable that it is more often between 95 and 98 per cent lagging than at 100 per cent, due to the transformer reactance. Therefore, this particular limitation is not a practical handicap for the rectifier. There are, however, three disadvantages which are important. These are the necessity of securing pure water for cooling the high vacuum pump, the danger of backfires when anodes get overheated

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from too long an overload or a poor vacuum, and telephone interference.

Backfires have now been diminished by means of newly-developed devices. They seem, however, to occasion an increase in the arc voltage drop and thus reduce the efficiency by about 1 per cent. Anti-backfiring devices installed on the Montreal Tramways have been very effective. The average interruption due to a backfire is about 40 seconds and does not interfere with the car service. Both the d.c. and a.c. breakers open immediately on the occurrence of an internal flashover, thus clearing the short between anodes. The a.c. breaker recloses shortly afterwards and the rectifier goes back on the d.c. bus without any difficulty whatsoever. As mentioned, the backfires do not annoy the car service, but they do occasion high electromagnetic stresses on the transformer windings, on the high-tension buses and on the cables. If the feeding network is of small or medium capacity, objectionable voltage dips are occasioned thereby, and the power company will complain about them. With reference to dips in the supply voltage, it may be added that the starting of the rectifier unit does not produce such a long and important transient as for a heavy rotating machine. This is because the quantity of electromagnetic energy to be stored in the apparatus is less in the former case and no moving masses have to be accelerated. Hence, the voltage dip is extremely short and its value lower than in the latter case.

Telephone Interference the Most Serious Trouble

To overcome the interference to telephone systems a long experimental research was carried through by engineers of the Bell Telephone Company, the American Telegraph & Telephone Company, the Brown, Boveri Corporation, and the Montreal Tramways. The Bell Telephone Company had received many complaints from patrons near the substations, all claiming that conversation was seriously hampered by a large volume of noise. The studies revealed that electromagnetic induction between the trolley circuits and the telephone cable circuits was the disturbing factor, and noise measurements made with a standard noise meter revealed that the frequencies of the induced currents were a multiple of the product of the alternating-current supply frequency and the number of the rectifier anodes, or 360 cycles.

Many tests were performed to eliminate the noise, and many circuit arrangements were set up during the investigation. Different combinations of resonant shunt filters, connected across the d.c. buses and with an air core series reactor installed in the negative bus between the return feeder and the negative bus, were tried. Finally, proper values of reactance and capacity were found for each of the three resonant circuits to take care of the 360, 720 and 1,080-cycle harmonics which were found to be superimposed on the d.c. circuit. A temporary filter equipment was then installed in the basement of the Verdun substation of the Montreal Tramways, and left in service continuously since April 28, 1927. It has been very successful.

A permanent equipment has now been built and will soon be erected in the substation. It will consist of a .3 millihenry, 6,000-amp. air-core reactor and three shunt filters each composed of a small reactor in series with a suitable capacitor. The series reactor weighs approximately 4,000 lb. and the total equipment will occupy a floor space of 60 sq.ft.

September Meeting of Maryland Utilities Association

PROGRAM arrangements are now being made for the mid-year meeting of the Maryland Utilities Association, which will be held on Sept. 7, 1928, at the Braddock Hotel, Braddock Heights, Md. It is planned to have group meetings in the morning, sightseeing trips, a golf tournament, special entertainment for the ladies in the afternoon, and a dinner in the evening to be followed by dancing. Special efforts are being made to make the meeting attractive for the ladies, in the hope that a large attendance will result.

A.I.E.E. Elects Honorary Members

FIVE distinguished American engineers were elected honorary members of the American Institute of Electrical Engineers at a meeting of its board of directors held during the annual summer convention of the institute in Denver, Col., on June 27. The men thus honored were Thomas A. Edison, John J. Carty, Michael I. Pupin, Ambrose Swasey and Elihu Thomson.

This was the first time in the history of the A.I.E.E. that any Americans have been elected as honorary members. Previously there were a few foreign honorary members, but the number has always been severely restricted. These five men were elected by the unanimous vote of the 26 members of the board of directors.

Mr. Edison and Mr. Thomson are well known to electric railway men. Both of them were pioneers in development of the electric railway, and in the early days contributed greatly to its advancement. General Carty and Dr. Pupin are best known to the telephone field, while Mr. Swasey is a famous manufacturer of precision instruments and mechanism. All of them are outstanding figures in science and engineering, and their inventions are known not only in America but throughout the entire world.

American Association News

Bulletins in Preparation

SPECIAL reports listed below are being prepared by the bureau of information and service of the American Electric Railway Association. They will be available to member companies on request.

Bulletin No. 207—Accident Statistics of Electric Railways—1927—A comparative summary and analysis of accident statistics reported by 167 electric railways for the years 1927 and 1926. Some of the items covered are as follows: Total number of accidents, number of accidents involving motor vehicles, number of car collisions, number of persons injured, number of fatalities, total cost of claims, ratio of total cost to gross earnings, expenses of the claims department, number of car-miles run and number of passengers carried per accident, details of claims department expenses, etc.

Bulletin No. 208—Accident Statistics of Motor Bus Lines Operated by Electric Railways.—This bulletin gives a comparative summary and analysis of the accidents reported in 1927 and 1926 of seventy-three bus companies operated or controlled by electric railways. Substantially the same information as is given for the railway lines in Bulletin No. 148 is given for the bus lines in this bulletin.

Bulletin No. 209—Comparison of Electric Railway Operating Conditions, Operating Expenses and Results of Operation on Various Unit Bases—Part II., Interurban Lines.—A tabulation of data for interurban lines similar to that given last month in Bulletin No. 203 for the city lines. The data includes the average speed, number of revenue passengers carried per car-mile, per mile of track, per car operated, etc., the operating revenue, operating income and net income per mile of track, cost of maintaining plant and equipment per car-mile and per unit of property maintained, and operating costs on various unit bases of comparison.

Bulletin No. 210—Trend of Material Prices.—A new edition of the Association's regular bulletin on relative cost of materials, bringing down to date the trend of prices of materials used by electric railways, based on data contributed by manufacturers of such material.

The following supplements also have been prepared, bringing the information they cover down to date:

Supplement No. 23 to City and Interurban Fare Bulletins.

Supplement No. 9 to Bulletins Nos. 163 and 164: *Electric Railway Fares.*

Supplement No. 4 to Bulletin No. 188: *Wages of Trainmen.*

Supplement No. 4 to Bulletin No. 189: *Wages of Bus Men.*

Cost of Living Studies (Bulletin No. 211).

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News of the Industry

New Franchise Talk in Akron

Discussion is expected to begin soon on the terms of the new contract under which the Northern Ohio Power & Light Company will be permitted to operate in Akron in the future. So that they may be better informed on railway questions the Mayor of Akron and the service director of that city have been enquiring into the operation of the railway systems in other cities, and studying the terms of some of the so-called model franchises. Among the cities they have visited is Cincinnati, which is believed to be more nearly a counterpart of Akron in its physical aspects than any other city in the Central West.

The four-year term under which the company is now operating its transportation lines in Akron expires on Dec. 1. That grant was purposely drawn for a short period so that experience under new terms of operation might be definitely recorded as a guide to a future grant of longer duration. This grant, passed by the voters of Akron by 28,682 to 24,872, provided for a 7-cent cash fare, four tickets for 25 cents, or seventeen tickets for $1. Express bus service is provided at a 10-cent fare.

The franchise that is now soon to expire took the place of the temporary contract made on Feb. 27, 1924, following a period of 27 days, when the city attempted the famous motorization scheme. The old 25-year franchise period expired on Feb. 1, 1924, and the city sought to require the company to continue operation for a period of three to six months at the old 5-cent rate of fare. The controversy in Akron at that time was long drawn out. The steps that led to operation under the terms soon to expire were all reviewed in ELECTRIC RAILWAY JOURNAL at the time.

Utilities Want Judgment Withheld Until Inquiry Is Ended

The joint committee of the National Utility Associations has made every effort to co-operate with the Federal Trade Commission in its investigation of public utilities but final judgment as to the propriety and value of the activities disclosed cannot rest securely on fragmentary portions of the record, the counsel for the joint committee. So declared Josiah T. Newcomb, for the utilities, in a statement made to the commission on July 6.

Publicity given to isolated and scattered portions of the record has resulted in misleading impressions regarding the activities of the industry, the statement declared. The utilities will await the conclusion of the branch of the investigation under way at present before asking the opportunity to present evidence to offset these "misleading impressions" or to introduce affirmative evidence showing the nature and extent of the influences hostile to the utilities which it seemed necessary to combat, according to the statement.

It says that it agrees that material furnished to schools should be free from prejudice and bias, but that it believes that those who are in a position to furnish "technical and economic" information to teachers, are under obligation to do so. Advocates of nationalization of industry and of placing the government in competition with public utilities industries, have extended their influences into schools and colleges, the committee charges. It refers specifically to the League for Industrial Democracy the Public Ownership League, the National Popular Government League, and the People's Legislative Service, and refers personally to Gifford Pinchot and Senator Norris of Nebraska.

Following the hearing on July 6, the commission adjourned "subject to call some time after Sept. 1," with provision for emergency hearings before that time.

Fare of Casual Rider Advanced

Galveston company authorized to charge 10-cent cash fare with four tickets for 30 cents and 25-cent weekly card

AN ORDINANCE was adopted in Galveston, Tex., on June 18, which prescribes the following fares on the railway lines of the Galveston Electric Company:

Adult ride, 10 cents, or four tokens for 30 cents, or a weekly ticket costing 25 cents, which entitles the bearer to ride for 5-cent fare whenever the weekly card is presented.

Half fare, 5 cents, or seven tokens for 25 cents.

Prior to that date the fare was 6 cents for an adult ride and 3 cents for half fare, with the usual transfer privileges. In other words, the new arrangement places the burden upon the infrequent rider. The regular rider has had his fare increased very slightly. On June 25 the company reported riders were responding favorably.

On Nov. 17, 1927, a pamphlet was distributed to the public which set forth the company's story, beginning with June 30, when it presented to the Mayor and commissioners a statement showing what had been accomplished, and ending with a financial statement showing a deficit of 43,000 for the year ended Sept. 30, 1927. In seeking an adjustment the company said it was not its purpose to secure a rate which would produce any more revenue than was necessary for the company to put its finances in condition to maintain proper service, and to continue as a factor in the development of the city.

The difficulties under which the city's transportation service has been operated and the reasons for the losses sustained were made plain in the company's statement by the use of a table, showing that on Dec. 31, 1920, the number of automobiles registered in Galveston County was 4,315, and the number of revenue passengers carried on the Galveston car lines in 1920 was 11,290,030. In 1927 (ten months) the number of automobiles had increased to 12,519 and the number of revenue passengers carried on the Galveston lines had fallen off to 7,344,833. The company stated also that during 1928 it was facing expenditures of from $80,000 to $100,000 for additional paved track construction, in order to cooperate in the city's street improvement program. Another factor contributing to the present unfavorable showing of the railway, it pointed out, was the general increase in prices and wages which had taken place in the past ten years. In Galveston wage rates had been practically doubled, and other costs had increased in proportion. In the face of all this the company had spent approximately $65,000 for new cars of the most modern design.

The present financial showing of the transportation department precluded the finding of investors to put additional capital into this branch of the business. As a proof of this the company offered as evidence the twelve months' statement for the period ended July 31, 1927:

Revenues for fares collected and all miscellaneous sources of revenue	$546,305
Operating expenses representing the everyday cost of operating the service	365,216
Balance	$181,089
Taxes	36,455
Balance	$144,634
Depreciation	70,829
Net earnings left to pay interest on $2,170,718 money invested	$73,805
Amount necessary to pay 8 per cent on cash investment	173,657
The deficit by which the earnings failed to equal 8 per cent	$99,852
Cash investment of $2,170,718 upon which net earnings equal only, per cent	3.40

Having summarized the difficulties the company presented its plan for a fare adjustment.

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Injunction Proceedings in Chicago

Attorneys for the Chicago Rapid Transit Company filed a petition with the Federal District Court on July 5 seeking a temporary injunction to restrain the city of Chicago and the Illinois Commerce Commission from preventing an increase of 20 per cent in elevated fares. The action is based on the recent order of the commission which denied the application of the company for the cancellation of the three-for-25 cents ticket rate and weekly pass and the adoption of a flat 10-cent fare.

The bill asks a restraining order to "prevent immediate and irreparable injury, loss and damage to the plaintiff," charging that instead of an 8 per cent return on its valuation, to which the company is legally entitled, earnings under the present rates amount to less than a 2 per cent return. The rates which the company seeks to establish would yield a return of about 4.85 per cent. With operating losses totaling several thousand dollars a day the rates now in force, it is claimed, are confiscatory.

After giving a description of the companies' properties, the petition cites the fact that the Commerce Commission agreed to a valuation of not less than $92,558,000. In its decision of June 28 denying the company's application, the commission declared that "while it is unquestionably true that the company is not receiving the full return on its investment which the courts have decided is a reasonable return," the company was building up its business under the present rates and contended that a higher fare would possibly result in decreased riding. Aside from its contention that the valuation claimed by the company was too high and that a new valuation would be necessary before granting a fare increase, the city presented very little evidence to oppose the application.

Fare Revision in St. Petersburg

The Municipal Railways of St. Petersburg, Fla., have received permission from the City Commission to revise and simplify the fares of the trolley and bus routes in line with recommendations submitted by R. E. Ludwig, director of public utilities, as follows:

The 10-cent cash fare is made standard on the cars in line with the 10-cent charge applied to the bus routes when the latter were installed July 1, 1926.

The 6¼-cent (sixteen for $1) trolley token rate will be changed to 7½ cents (seven for 50 cents), but the tokens will hereafter be acceptable for bus rides as well.

The $1 weekly pass put into effect on Nov. 5, 1927, heretofore available only on the trolley routes, will also be good on the bus routes. This will eliminate the $1.50 car-bus pass.

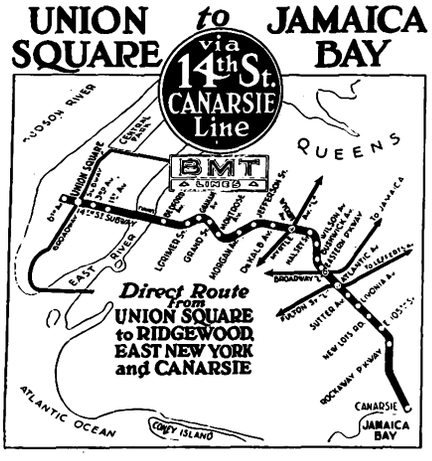
Heretofore, the only transfer granted was to the trolley route serving the municipal pier. The new schedule of fares grants universal transfers.

It is expected that the new rates will go into effect on or about Aug. 1.

Another New York Subway Line Opened

The opening of the Fourteenth Street-Canarsie line of the B.M.T. system on July 14, 1928, marked the end of more than fifteen years' anticipation by the residents of Ridgewood, East New York, Brownsville and Canarsie of direct rapid transit service between Union Square, Manhattan, and Jamaica Bay.

The Fourteenth Street-Canarsie line is part of the rapid transit system provided for in the dual subway contracts



Route expected to relieve congestion

of March 19, 1913. The city of New York in Contract No. 4, of March 19, 1913, agreed to construct a rapid transit route from Sixth Avenue and Fourteenth Street, Manhattan, to East New York where it would be connected with the existing "L" lines at that point. This route was intended to provide direct rapid transit service between the industrial district centering on Union Square, Manhattan, and the densely populated sections of Ridgewood, East New York and Brownsville. The lack of the completed Fourteenth Street line has been the cause for years past of the extreme congestion of transfer traffic in rush hours at Canal Street, Manhattan.

The Fourteenth Street-Canarsie line originally was planned as a subway from Fourteenth Street and Sixth Avenue, Manhattan, to Bushwick and Johnson Avenues, Brooklyn, and as an "L" from the latter point to East New York where it would connect with the existing "L" structures. Contracts for the construction of the subway section of the line were let and the contractor undertook to complete this section by June, 1918. Because of financial difficulties and war conditions, the construction of the subway section was delayed and it was not completed until 1924. Operation in the subway portion of the line was begun on June 30, 1924, and service between Sixth Avenue, Manhattan, and Montrose Avenue, Brooklyn, has been maintained since then.

Differences first as to the route of the eastern half of the line and finally as to whether the eastern half should be an "L" or a subway delayed the letting of contracts for this section. The B.M.T. announced in December, 1923, shortly after its organization, that it would agree to a modification of Contract No. 4, so that this eastern section might be constructed as a subway.

Objects to Condemning P.R.T. Underliers

In his annual report to the City Council, of Philadelphia, Pa., Comptroller Hadley said that the purchase of the underliers of the Philadelphia Rapid Transit Company by the city was not feasible from an economic standpoint and also that it could not be financed out of city loan funds. According to the Comptroller condemnation of the underliers by the city would not constitute a permanent improvement, and therefore, he would decline to certify to the use of loan funds for that purpose. Subsequently it was made plain that Mayor Mackey would instruct City Solicitor Ashton to proced with the condemnation of the underliers. If the project is sanctioned and Mr. Hadley still proves recalcitrant, the Administration will seek to compel his certification of the required funds by appeal to the courts.

The Public Service Commission already has held one hearing on the city's petition to condemn the underliers' holdings and another session is scheduled for July 16. The Mackey Administration, if a fair valuation is defined by the commission, is planning to exchange city bonds for the stocks and bonds of the underliers, with the expectation of saving $4,500,000 a year by substituting itself as lessor to the P. R. T. and collecting the approximately $9,000,000 a year which the transit company pays the underliers in rental.

The Comptroller says:

It is evident that the value of the physical improvements of the underlying companies is very small, and that the principal things intended to be purchased are the franchises, which certainly are not permanent improvements.

He then pointed out that the city charter permitted the city to borrow money only for permanent improvements and that improvements of a temporary kind have to be certified by the city comptroller to be capital expenditures as distinguished from current expenses.

On July 7 Mayor Mackay said:

I want to make my position plain on the proposal to condemn the underliers. If the program of acquisition upon which we have started cannot be carried out within four weeks so that the proposal can be submitted to the voters at a referendum in November, I am definitely through with it.

With possible litigation to be anticipated, I am not going to commit myself to a lengthy proceeding for the consummation of our plan. If the project is going to be dragged interminably through the courts, we should find out at once how we stand.

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Pipes, Kites and Popcorn at Cleveland Picnic

Candy kiss scrambles, grab races, bean bag relays, kangaroo balloon races, Jiggs and Maggie derby, egg throwing, chef boxing, and tug-of-war featured the first annual picnic of the Cleveland Railway held at Euclid Beach Park on June 29. Approximately 10,000 employees and members of their families participated in about 23 events on the program, played baseball, danced and listened to band concerts.

Post cards announcing the picnic and mailed to the home of each employee suggested packing up the basket, bringing the family, and having a wonderful time. Arrangements for this picnic, the first gathering of its kind on the Cleveland properties, were carried out by the general committee of the retirement and benefit plan in accordance with one of the regulations which stated: "A further object of the plan shall be the introduction and development of such projects for mutual good as the advisory committee may, from time to time, deem advisable."

It would appear that "mutual good" was derived. This viewpoint was shared particularly by the largest family on the grounds which, because of its numbers, was awarded the prize of one large ham. Other conquerors went home with perfume, knives, cigars, handkerchiefs and garters.

Ten days later, on July 9, the company gave a banquet at the Hotel Statler to its 90 former employees who are now on the pension roll. Besides being an expression of appreciation for the services of the pensioners, the banquet also marked the first anniversary of the starting of the pension and retirement plan. The pensioners represented a total of about 4,000 years of work for the company. The oldest in point of service was Henry H. Lutzy, 79, who worked for the company 60 years. F. N. Keldorf, 81, was the oldest guest, with 50 years of service to his credit.

Joseph H. Alexander, president of the Cleveland Railway, presented the guests with gold medals which, besides being ornamental, will entitle the holders to ride without charge on the company's lines.

Seven Cents Authorized in Ottawa

The board of railway commissioners has rejected the plea of the Ottawa Electric Railway, Ottawa, Ont., Canada, for an 8-cent fare but a majority decision of the board finds a 7-cent fare warranted. The majority decision is concurred in by Commissioners McKeown, McLean and Vien. The basic cash fare allowed is 7 cents for adults and 5 cents for children. Ticket fares are four for 25 cents for adults and seven for 25 cents for children. Tickets for school children under the age of fourteen are to be fourteen for 50 cents. The present 10-cent cash fare between midnight and 6 a.m. is unchanged. Increased fares as allowed average 6.24 cents per passenger compared with an average of 4.89 cents per passenger in the five-year period ending 1927.

The suggestion for a weekly pass is recognized as having advantages, but for the reasons put forward by R. M. Feustel, expert engaged by the city, the adoption of this system is left optional with the railway.

Agreement Continues in Toledo

A continuance of the wage and working agreement between electric railway employees and the Community Traction Company, Toledo, Ohio, has been decided upon with few changes. Last year's agreement expired on June 1, 1928. The basic wage rate remains 50 cents for the first three months; 52 cents for the next nine months and 55 cents thereafter, with an extra 5 cents for one-man or motor coach operation. Overtime is 75 cents an hour for two-man operators and 80 cents an hour for one-man operators. Overtime applies on all time more than ten hours a day or after completion of any run.

The men had asked for two weeks' vacation with pay, but waived the demand in the hope that other concessions might be gained with complete settlement of the railway problem.

Six Cents for Year on Queens Road

Permission to continue charging a 6-cent fare for another year was given the New York & Queens County Railway at the meeting of the New York Transit Commission on July 5. Application to extend the 6-cent fare order on the lines operating out of Long Island City, originally granted in June, 1924, was made by General Lincoln C. Andrews, receiver of the company.

Public Hearing on Omaha Grant

The liberal and friendly attitude of the new officials of the Omaha & Council Bluffs Street Railway, Omaha, Neb., appears to have almost completely dissipated the hostility which resulted, two years ago, in the voters denying the company a renewal of its franchise. Proof of this was furnished at the recent public meeting, where opponents of the proposed new franchise were invited to present their objections to the City Council before the grant is agreed upon as to the form in which it will be submitted. Only a few citizens appeared, and most of them commended the franchise as fair to both the city and the company. The only critics were those who urged that mail carriers in uniform be transported free, a provision President Shannahan objects is unfair since part of the expense of the rides of the mail carriers is from government expense money. At the last franchise election Councilman Daniel Butler led the opposition, but he is out of the Council and, following his defeat for Governor, out of politics.

Fare Increase Sought in Lynchburg

The Lynchburg Traction & Light Company, Lynchburg, Va., has filed notice with the City Council that on July 25 it will petition the State Corporation Commission for an increase of fare from 5 to 7 cents, with four tokens for 25 cents. The company also asked relief from franchise agreements to require the company to pave within the street car track area. The Council has decided to oppose the request for an increase in fare only if the commission finds the property valuation too large. The request for relief from franchise obligations has been referred to the city manager.

Franchise Not Required Where Commission Permit Is Held

Local transportation companies operating in Illinois cities and holding a certificate from the Illinois Commerce Commission are not required to obtain a franchise from the city. The Supreme Court of Illinois so ruled in two findings handed down at Springfield on June 23.

The two cases in which this question was at issue involved the right of the city of Chicago to compel the Chicago, North Shore & Milwaukee Railroad and the Chicago Motor Coach Company, respectively, to obtain local franchises for the operation of their cars and buses. Both cases were won by the city in the Circuit Court of Cook County (Chicago) but were carried to the higher court by the companies when permission to appeal was granted on the ground that a Supreme Court ruling was needed on a question of such general interest.

In reversing and remanding the decision of the Circuit Court, the Supreme Court held that any power that the city might have had over the operation of North Shore Line passenger and merchandise dispatch trains over the tracks of the Chicago Rapid Transit Lines within the city limits was abrogated with the passage of the Illinois Commerce Commission Act. It also held that when a railroad corporation such as the Rapid Transit Lines does not operate a sufficient number of its own trains on that right-of-way it is permitted to enter into an agreement with another railroad for the joint use of that route.

The case of the Chicago Motor Coach Company has been pending in the Supreme Court since 1926. It was carried there by the bus company from a decision by the Circuit Court which upheld the contention of the city that companies which seek to operate must secure permission from the City Council for the use of streets as bus routes. As in the North Shore Line case, the Supreme Court held that a certificate from the commission was sufficient.

The city has filed notice with the Supreme Court that it will seek a rehearing of its case before July 18.

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Taxis Give Jitney Service in Washington

Announcement on the part of the Independent Taxicab Association of the District of Columbia that it intended to start 10-cent jitney taxi service during the morning rush hour, was carried into effect on July 12.

Railway men do not believe that the taxicab organization can handle more than a thousand passengers a day, but the objection is raised that by acceding to the request of the independent owners, the way will be open for all the taxi organizations to start similar operation. All taxicabs in the city cannot be operated even during part of the day as jitneys without disrupting the common carrier service of the existing railway and bus lines.

As a precaution the Public Utilities Commission had notified the Independent Taxicab Owners that they must make formal application if they wish to institute service of this kind so that a hearing could be called on the subject, but the taxi men ignored this warning.

Moreover, due to the loose organization of this association, practically no protection is assured the public in the form of liability bonds. Regulation by the commission of the taxicabs as they are now run is a mooted question, but the matter will most surely go into the courts for adjudication now that the taxi association has carried out its new plan, it being pointed out that whatever the legal opinion may be regarding the present status of taxicabs as common carriers, the uncertainty would be removed should taxicabs engage in clearly common carrier service. On the other hand, the taxi men are said to rely on the idea that classification as common carriers is determined by whether or not a fixed route is followed. If that is true they could escape this supposed definition by following any route from time to time.

Sight-seeing Continues in Montreal

Approximately 100,000 passengers patronize during the summer months the sight-seeing car service supplied by the Montreal Tramways, Montreal, Quebec, around the mountain there. Five years ago the patronage totaled 66,000. The trip is approximately 12 miles, takes one hour and costs 25 cents per passenger.

In June 25 years ago the Montreal Tramways instituted this service. In those days an ordinary open car was used. Appropriate placards were placed on the car and a guide was in attendance announcing points of interest. From the start the service proved popular and it soon became evident that larger cars would be desirable. In the fall of 1904, D. E. Blair, now general superintendent of the company, attended the St. Louis Exposition, and there noted a new type of sight-seeing car. He suggested a new design and it was accepted. The first observation car of the new type was built in the spring of 1905. Two new cars were purchased for this service a few years ago, and six are now available in service. Consistent increase has been experienced in the receipts from this service.

Appreciation in Fitchburg

Fitchburg, Mass., apparently appreciates the work done by the officers and directors of the Fitchburg & Leominster Street Railway as indicated by a recent meeting of the board of directors of the Fitchburg Chamber of Commerce at Whalom Inn, one of the concessions at a park owned by the railway. The chamber directors invited all of the newspaper reporters in the city to be their guests at the "booster" meeting, the purpose of which was to show in positive form a type of publicity which was favorable to the city.

C. Willis Bennett, president of the chamber expressed the opinion of its 1,000 or more members in congratulating Emerson W. Baker, president of the company, for having a place as fine as Whalom Inn and for his work in reorganizing the Fitchburg & Leominster Street Railway. He referred to the installation of new cars and buses and the service the people were getting, which has restored their confidence in the company. He said that the park had helped make Fitchburg an ideal convention city and that it was to Mr. Baker's credit that all these things had been done.

In reply President Baker explained something of the problem confronting him. He said that for five months of 1926 the company showed a difference between income and expense of $18,000; in five months of 1927 a difference of $30,000 and this year for five months a difference of $51,000. He said in part:

We have stricken out many car-miles, representing about $60,000 in expenses. We have found that more people are riding today on electric cars here than two years ago. We have had to analyze our problem and then plug the gaps we found. At the park here not long ago there wasn't a roof that didn't leak. We put $27,000 into it and public response was immediate.

$500,000 Improvement Program for Dallas

In working out the agreement as to improvements to be carried out by the Dallas Railway & Terminal Company, Dallas, Tex., Supervisor of Public Utilities John W. Everman is understood to have insisted that the present schedule of fares be continued for the next three years. At first railway officials opposed a clause that would bind them to maintain the present rates without seeking for higher fares, but it has since been indicated that an agreement is near completion and that in accepting the schedule of improvements to be made, the company will not oppose the continuation of the present 6-cent-token, 7-cent cash fare. Earlier this year the company sought a higher rate and after a long drawn-out public hearing before the City Commission, withdrew its application "without prejudice."

They stop boosting at Fitchburg long enough to be snapped

Improvements totaling in cost more than $500,000 are to be carried out by the railway under Everman plan No. 5 under which the railway is committed to finish the extension of the Junius Heights car line as soon as litigation is concluded and it is made legally possible.

Paving Relief Secures Retention of Redlands Line

The Railroad Commission of California has dismissed the application of the Pacific Electric Railway, Los Angeles, Cal., to abandon service and remove its tracks on its Smiley Heights line in Redlands, an agreement having been reached between the applicant and the city to the effect that if the railway would continue the operation of the line the city would not require the company to pave its tracks on Cypress Avenue, Center Street, or Cedar Avenue when these streets are improved with an expensive type of paving. It was agreed that the company would make repairs estimated to cost $5,000 so that the track would not form an obstruction to vehicular traffic.

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Commission in St. Louis Named

Mayor Victor J. Miller of St. Louis, Mo., announced the personnel of the city's Transportation Commission on July 9 which shall endeavor to solve traffic problems. The seven citizen members of the commission are:

E. J. Russell, chairman of the City Plan Commission and member of the architectural firm of Mauran, Russell & Crowell, chairman; August A. Busch, president of Anheuser-Busch, Inc.; C. P. Delore, president of the South St. Louis Business Men's Association; A. H. Reller, president of the Bremen Bank; Claude B. Ricketts, manager of the Railway Exchange Building; F. X. Salomon, general manager of the Famous-Barr Company's department store and Erastus Wells, vice-president of the St. Louis Union Trust Company and a son of Rolla Wells, who served as receiver for the United Railways, the predecessor to the present St. Louis Public Service Company.

The other members of the commission, as fixed by ordinance, are: One member of the Board of Alderman, Edward L. Kuhs, Alderman from the first ward; Mayor Miller, City Comtroller Louis Nolte, E. R. Kinsey, president of the Board of Public Service; Walter J. G. Neun, president of the Board of Aldermen, and Director of Streets and Sewers Brooks.

Samuel W. Greenland, vice-president and general manager of the St. Louis Public Service Company, will represent the company on the Transportation Commission. The Missouri Public Service Commission will also select a member for the commission.

At the first meeting of the commission on July 9 Mr. Kinsey suggested that a transit survey made in 1926 by C. E. Smith, then consulting engineer for the city, be used as the basis for the new survey.

Fare Petition in Springfield Suspended

The petition of the Illinois Power Corporation for an increase in fares in Springfield, Ill., has been suspended until Jan. 7, 1929, by the Illinois Commerce Commission. Hearings will be held in the meantime. The company is seeking to establish a 10-cent fare with three tokens for a quarter and a children's fare of 5 cents. At present the 10-cent fare is basic, but two tokens are sold for 15 cents. The fare for children is 3 cents.

Abandoned Rights-of-Way in Portland Offered to County

The Portland Electric Power Company, Portland, Ore., has offered free to the County of Multnomah, a section of the Mount Hood electric road from Montavilla to Gresham and a part of the old Troutdale line. These abandoned rights-of-way are from 60 to 100 ft. wide. The county must bear the expense of moving the poles, however, which would entail an expenditure of about $7,500. The county commissioners, however, favor acceptance of the offer as it will make certain highway extensions possible.

New Fare Schedule

Increase authorized on lines in Maine. Commission scores lack of public co-operation. Economic laws require increased rate

PRINCIPAL changes provided in a recent decision of the Maine Public Utilities Commission include the elimination of the present ticket fares, the adoption of cash fares for all travel and an increase in the length of the present zone limits on the lines of the Cumberland County Power & Light Company, Portland, Me. The decision was handed down after a lengthy review of facts and figures brought to the attention of the commission in the recent hearing and after a survey of the financial structure of the railroad department of the company. Although fare increases were prescribed over most of the 77 miles of line operated by the company, in one or two instances a decrease of the present rate was obtained.

Proposed rates provide an initial cash fare of 10 cents for a two-zone ride or less and the establishment of a 5-cent cash fare for each additional single zone. School tickets on the basis of 5 cents for a continuous ride of three zones or less are to be continued, and will be valid for a two-zone ride or less.

The former zone system was composed of single zones constituting distances of approximately 1 mile. The 8-cent ticket fare permitted a continuous ride of three zones or less. A passenger having paid the initial 8-cent ticket fare might continue to the succeeding zone in excess of the first three zones on the basis of a ticket fare of 2⅔ cents per single zone. The cash fare of 10 cents entitled the passenger to a continuous ride of three single zones or less, and on the payment of the initial minimum cash fare might continue through succeeding zones on the basis of a cash fare of 3 cents per single zone.

Figures submitted by the company are:

CUMBERLAND COUNTY POWER & LIGHT COMPANY PORTLAND RAILROAD DEPARTMENT INCOME STATEMENT

Year	Total Revenue	Operating Expense	Deductions for Lease of Road and Taxes	Deficit
1918	$1,216,357	$993,820	$332,792	$110,255*
1919	1,513,500	1,244,210	349,634	80,344*
1920	1,667,372	1,425,103	362,981	120,711*
1921	1,696,279	1,391,938	367,136	62,795*
1922	1,668,239	1,304,275	368,876	4,912*
1923	1,703,458	1,377,771	366,584	40,897*
1924	1,582,263	1,274,907	367,420	60,064*
1925	1,451,902	1,165,195	360,926	72,220*
1926	1,402,767	1,178,620	351,959	127,812*
1927	1,296,423	1,115,843	352,433	171,853*

* Operating deficit.

The commission said that these figures forced it to the inescapable conclusion that an increase in fares must be granted or the patrons "must pay increased rates for their electricity sufficient in amount to compensate for annual deficits, if any." It held that economic laws demanded increase and that while the business of the company was charged with a public duty, such duty implied a corresponding obligation on the part of the public to accord financial support to the company if the service were to be continued in its entirety. It could only be continued if such co-operation were given by the public as would enable it to discharge efficiently its public undertaking. Further there were many persons who did not use the electric road facilities and in justice these should not be required continuously to contribute to offset such deficits. The company was praised by the commission for its accurate methods of bookkeeping.

Singing Out of Tune

IF WE were on a Public Service Commission and heard a refrain that the commissions favor the corporations, we would probably join that part of the congregation which loses its temper, easing our dudgeon a bit perhaps by agreeing with James Whitcomb Riley:

"I've allus noticed grate success
Is mixed with troubles, more er less,
And it's the man who does the best
That gits more kicks than all the rest."

Not being on a Public Service Commission, however, but being familiar with commission decisions against corporation contentions over a long period of years *we can't help joining that part of the congregation which laughs* when we hear these pro-corporation notes. If you have any doubt as to the fact that commissions are not pro-corporation, open the books and see how often the commissions have been reversed by the courts on the ground of being unfair to the corporations.—H. C. Spurr in *Public Utility Reports.*

Safety Pennant Won in Portsmouth

The Portsmouth division of the Virginia Electric & Power Company, Richmond, Va., unfurled a safety pennant on June 14 which it won in competition with the Richmond, South Richmond, Petersburg and Norfolk divisions of the company. The trophy was offered by President W. E. Wood for excellence in safety work and Portsmouth established the leading record for the month of May by operating the greatest number of miles per accident. Miles operated per accident during that month were more than 62 per cent over May of last year.

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Recent Bus Developments

Three Per Cent Bus Tax Held Valid in Alabama

A recent act of the state Legislature fixing a 3 per cent privilege tax on the gross receipts from buses and taxicabs "operated for hire in Alabama" has been held constitutional by the Alabama Supreme Court. The decision was rendered on an appeal from the Elmore County Circuit Court in a case brought against Henry Clifton to recover privilege tax for the operation of buses. Mr. Clifton's lawyers contended that the legislative act fixing this tax was unconstitutional.

Bus Purchase Approved in New Jersey

Approval of the sale of one bus operated by the Maurice River Transportation Company between Millville and Vineland, N. J., by way of Malaga Road, to the Public Service Coordinated Transport has been announced by the State Board of Public Utility Commissioners of New Jersey. The commission has also approved purchase by the Public Service of a bus operated on the South River-Milltown route by Anthony Daskiewicz.

Bus Will Supplant Car Line on Denver Interurban

The Denver & Crown Hill Railway, subsidiary of the Denver Tramway, Denver, Colo., operating cars from 29th and Wolf Streets to the Crown Hill cemetery, a distance of about 1 mile, has notified the Public Utilities Commission that on Aug. 1 it will abandon its line, take up its track and cover the territory with a bus. A permit to operate a bus in conjunction with the car line was granted a few months since and the bus is favored to supplant the car.

Binghamton Bus Transfer Under Advisement

The Public Service Commission has taken under advisement a petition for the transfer to the Binghamton Railway Bus Lines, Binghamton, N. Y., of three certificates under which the Triple Cities Bus Lines operate. It was pointed out at a recent hearing that if the transfer is approved the company will take over the rolling stock and equipage free and clear. A restatement of the advantages of co-ordination of routes and elimination of competition was also read into the record. Commissioner of Public Works V. W. Burley, who also is superintendent of the railway, testified that he had acted in an advisory capacity with relation to operations of the bus lines. He told about the short term leases entered into between the railway, which owns virtually all the bus stock, and E. J. Dorey, operator of the Triple Cities lines. The transfer was not opposed.

Lines in Massachusetts Authorized

The Massachusetts Public Utilities Commission has granted the petition of the Springfield Street Railway for authority to operate a bus line with service at two-hour intervals during the day between Victoria Square, Springfield, and Palmer. Another line is authorized to connect with the North Wilbraham line, and with the Springfield-Worcester line, the last being for the accommodation of school children and factory workers.

Bulletins in Baltimore Encourage the Men

Adrian Hughes, Jr., superintendent of bus transportation of the United Railways & Electric Company, Baltimore, Md., has been placing on the bulletin boards in his department helpful suggestions and interesting data of original character, or gleaned from other sources. Sometimes it is a combination of both, a clipping being supplemented by some personal comment. A recent interesting bulletin was taken from a newspaper and showed the reciprocal obligation of an employee in a plain common-sense way.

New Lines Started in Kansas City

The Kansas City Public Service Company started two new bus lines in Kansas City, Kan., beginning July 8. This is a part of an extensive rerouting program which involves three intercity street car lines and other Kansas City, Kan., lines.

Ohio Permit Revoked

State commission rules against interstate carrier which persistently abused its operating rights by carrying passengers in local service under subterfuge

THE Public Utilities Commission of Ohio recently made plain its position with respect to common carriers which disregard the restrictions imposed by it in granting certificates of convenience and necessity when it ordered the Detroit-Cincinnati Coach Company, Inc., to desist from all operation in that state under the certificate previously awarded. The proceeding came before the commission on complaints filed by the Western Ohio Railroad, the Toledo, Bowling Green & Findlay Railroad, the Lima-Toledo Railroad, the Cincinnati, Hamilton & Dayton Railroad and the Dayton & Troy Railroad, electric lines, against the Detroit coach line which was granted a certificate on Oct. 4, 1927. Under the terms of the grant it was authorized to operate in interstate service only through Ohio between the Ohio-Michigan state line, north of Toledo, Ohio, and the Ohio-Kentucky state line between Cincinnati, Ohio, and Covington, Ky., its entire operation being between Detroit, Mich., and Covington, Ky.

The complainants contended that the respondent engaged in the performance of a subterfuge intrastate operation. Witnesses testified to the purchase of tickets in Cincinnati to Monroe, Mich., —which is just across the Ohio-Michigan line—even though they stated that they wished to go only as far as Toledo, being advised that they could get off at Toledo, although in order to escape the requirements of the law the ticket had to read "Monroe, Mich." Witnesses also testified that they had purchased tickets in Toledo when they were bound for Cincinnati, Ohio, although they advised the ticket sellers of the same; these witnesses testified that they were told they must purchase tickets which read "Covington, Ky." Covington is just across the state line from Cincinnati. The record also contained evidence to the effect that passengers going to and from intermediate points within the state of Ohio along the respondent's line were also transported according to their wishes.

The commission was led to conclude that the violations alleged by the complainants were fully substantiated. The commission found that the coach line, under interstate certificate No. 2749, had performed an intrastate service without having first obtained a certificate of convenience and necessity for intrastate operation. The commission also found that the respondent had at various times violated the laws of Ohio and the rules of the commission in operating its vehicles at an excessive and dangerous rate of speed.

The commission has always held that it is an established principle of law that one may not evade reasonable state and local regulation by the mere linking of intrastate transportation to an interstate operation. This is the gist of the finding of the Supreme Court of the United States rendered on Jan. 3, 1927. According to the commission it is also clearly the law that a state has power in public interest reasonably to control and regulate the use of its highways so long as it does not directly burden or interfere with interstate commerce.

The respondent questioned the right of the commission to revoke its certifi-

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cate, yet it invoked the commission's jurisdiction when applied for the right to run. In this connection the Ohio commission quoted the Supreme Court of Ohio as follows:

1. Sections 614-86 to 614-102, inclusive, of the general code of Ohio, are designed to regulate motor transportation, governing all motor vehicles operating over the highways of the state, but do not authorize the Public Utilities Commission to exclude motor transportation companies operating in interstate traffic from such highways.

2. Motor transportation companies operating in interstate traffic are subject to the provisions of said sections and the regulations therein provided may be applied to all interstate operators, except in so far as such application would involve a direct burden upon interstate commerce.

3. A condition in a certificate of convenience and necessity granted to an interstate operation that passengers may not be received within the state of Ohio whose destinations are also within the state of Ohio is not an unreasonable condition, and does not operate as a direct burden upon interstate commerce.

The commission then referred to the fact that in Clark, et al vs. Public Utilities Commission of Ohio, the Supreme Court of the United States on May 31, 1927, held that the users of state highways, although engaged exclusively in interstate commerce, are subject to regulations by the state to insure safety and convenience and the conservation of the highways. The commission said that it had always recognized that no discretion exists as to the issuance of a certificate so far as convenience and necessity are concerned, where the carrier is engaged exclusively in interstate commerce and has applied for a certificate and complied with the other provisions of the law. The commission, however, deems that it does possess a discretion so long as reasonable provisions of the law are not complied with. Thus, without the performance of certain conditions precedent, the commission may refuse to grant an interstate operator the right to do business. This power of the commission to create also carries with it, if the law is not complied with after legal inception of operation, the power to destroy. In so holding, no one is discriminated against nor is interstate commerce obstructed.

Under the protection of its certificate to operate in Ohio in interstate commerce only, the coach line, in fact, carried on an intrastate transportation of passengers. In this way it did indirectly that which it could not have done in a direct manner. The state body said:

> All motor transportation companies operating within the state of Ohio, whether they be engaged in intrastate or interstate commerce, are compelled to comply with the police regulations of the state. The commission has always taken the position that violations of this nature, if sufficiently aggravated, are a proper ground upon which to base revocation. If aggravation ever existed, it is to be found in the instant case.
>
> On a record such as is to be found herein, this commission does not hesitate to pass upon the intricate legal propositions involved, even though they bear upon the whole subject of motor transportation in interstate commerce. The principle at stake is vital and the commission has no desire to escape what is its manifest duty.
>
> If this commission does not have the power to revoke an interstate certificate for violations of this nature it cannot possibly regulate transportation service within the state of Ohio. As a commission, we cannot submit to such an interpretation of the law. It is our duty to curtail such illegal, unethical, unfair and reprehensible practices. No transportation company by mere evasion will be permitted to turn what is clearly an intrastate movement of passengers into interstate commerce for the purpose of claiming the protection of federal statutes.

Commission Plan on Baltimore Bus Business Relinquished

After consideration of the matter from every angle, the United Railways & Electric Company, Baltimore, Md., has decided to discontinue, effective July 15, the plan of paying employees a commission of 5 per cent on chartered bus business they obtained. A serious obstacle to its practical success according to *Trolley Topics*, the official publication of the company, is the fact that the 5 per cent commission eats heavily into the very narrow margin of profit on this business.

Buses Replaces Railway in Grosse Pointe

Buses of the Detroit Motorbus Company, Detroit, Mich., went into operation recently on the route between Grosse Pointe and the city limits at Jefferson Avenue, following cessation of service by the Detroit United Railways. The railway service was halted by order of the village of Grosse Pointe, which contends that the company's franchise to operate through that municipality expired at midnight on April 30. The buses run from the city limits via Fisher Road, Grosse Pointe Boulevard, Provençal Boulevard and Lake Shore Road.

Counsel's Ruling Affects Seattle Taxicab Status

Way was cleared for a final decision in the taxicab controversy in Seattle, Wash., when Corporation Counsel Thomas J. L. Kennedy, in an opinion to the Council, ruled that the Council can legally grant the franchise sought by a group of local capitalists, represented by Robert S. Macfarlane, giving them a monopoly of the taxicab business in Seattle. Mr. Macfarlane's clients propose to form a $1,000,000 corporation, buy out all the existing taxicab companies, deed the cabs and other property to the city for $1 and then lease them for a period of 50 years, paying the city as a franchise tax 2 per cent of their gross receipts. The proposed corporation would have exclusive rights to operate taxicabs, subject to police regulations imposed by the Council.

Pending a decision on that proposal, the City Council has under consideration two ordinances for regulating the taxicab industry, one prescribing a metered-fare basis for all taxicabs, and the other permitting either a meter or zone system of charges.

Municipal Operation of Buses Rejected in St. Paul

A charter amendment to permit the city of St. Paul, Minn., to buy, own and operate transportation facilities inside the city limits was defeated recently when the measure failed to receive the 60 per cent of the vote necessary to carry. The proposal to amend the charter followed refusal of the voters at the last election to adopt an amendment allowing the City Council to vote expense relief suggested by the Minnesota Railroad & Warehouse Commission to enable the St. Paul City Railway to come nearer the 7½ per cent return on its valuation authorized by the commission. It had been suggested that the company be relieved of cost of paving between tracks where the streets were already paved.

The bureau of municipal research regarded the measure as the opening wedge for a municipal bus line involving an initial cost to taxpayers of "not less than $11,010,000." The enabling act would have permitted five members of the Council to submit a bond issue proposal that would require only a majority vote at an election for ratification, and would commit the city to municipal ownership and operation of a bus line.

Replacement on New Castle Line

Permission was granted the New Castle Electric Street Railway, New Castle, Pa., by the Public Service Commission on June 26 to discontinue service on the Grant Street line and on a portion of another line to Cascade Park. Action on discontinuing service from Mill Street and Long Avenue was withheld pending submission of additional facts.

The commission approved the application of the Pennsylvania-Ohio Coach Line Company to operate buses to serve the territory in which railway service was discontinued. The bus company is a subsidiary of the Pennsylvania-Ohio Electric Company.

Public Decide on Bus Service in Richmond, Ind.

A report approving the petition of the Terre Haute, Indianapolis & Eastern Traction Company to the Indiana Public Service Commission for authority to establish a bus service in Richmond has been made by the commission and adopted by the City Council of Richmond. The report will be submitted to a public hearing.

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Financial and Corporate

Voting Trust in Brooklyn Terminated

Holders of voting trust certificates of the Brooklyn-Manhattan Transit Corporation will be notified soon of the termination of the agreement and of the resignations of Albert H. Wiggin, Gerhard M. Dahl and Frederick Strauss as voting trustees. The agreement was renewable by its terms for another five-year period, but upon decision of the trustees it was allowed to terminate. The stockholders will meet on Sept. 10 for the first time since the company was organized on May 24, 1923, to elect directors and transact company business.

The voting trust agreement expired on July 1, last, and on July 5 the B.-M. T. applied for listing of 249,468 shares of series A no par preferred stock and 769,911 shares of no par common stock, comprising its total outstanding shares of both classes. These shares will supersede the voting trust certificates after trust certificate holders have been notified of the termination of the agreement and have received an opportunity to exchange their trust certificates for stock certificates.

An official, who has been in close touch with the lengthy negotiations in which representatives of the company, the Board of Transportation and the Transit Commission have participated during the past four or five months, has indicated that the corporation, in terminating its trust agreement and seeking to list its shares, was paving the way to final negotiations with the city by removing the financial framework set up as essential following the reorganization of the Brooklyn Rapid Transit in 1923.

Ontario Road to Pass to Hydro

The final stage appears to be approaching in the deal by which the Windsor, Essex & Lake Shore Railway will be taken over for operation by the Ontario Hydro-Electric system. Before the transfer can be effected to the association of municipalities which will be the real purchaser, a deed must be given by the Dominion Light & Traction Company, present owners, turning over the property free of encumberance and on receiving it formal application must be made to the head office of the Hydro Radial Commission in Toronto for operation of the line.

Until the deed has been executed operation by the Windsor, Essex & Lake Shore Railway under present management will continue. Even after Hydro management starts, the present cars will be continued in use. Immediate work probably will be started on the roadbed, however, and as soon as possible cars now in use will be scrapped for the regular type Hydro cars. Officials of the hydro system plan to develop excursion business to lakeside parks.

Under the arrangement now proposed an additional amount of debenture charges will have to be divided among the nine municipalities included in the association which will purchase the railway. The sum that must be added to the amounts previously fixed for the nine municipalities is $121,000, made necessary by the fact that three townships have withdrawn from the association and it has become necessary for the remaining ones to assume the amounts that would have been theirs. It will be necessary for municipal councils to approve the change, but representatives of the towns have expressed the opinion that the vote in each case would be favorable.

T. C. Cherry Named Receiver

Talmadge C. Cherry has been appointed receiver of the Syracuse, Lake Shore & Northern Railroad and the Auburn & Northern Electric Railroad by Supreme Court Justice Ernest I. Edgcomb. Mr. Cherry has been temporary receiver in the bankrupt concerns for several months. He has also since April 29, 1927, been receiver of the Empire State Railroad, which operates the other two roads.

Officials of the Syracuse, Lake Shore & Northern filed a petition for voluntary dissolution the first of the year. Later suit was brought to foreclose a mortgage for $2,500,000 under which the American Exchange-Irving Trust Company acts as trustee in the interest of the holders of the bonds.

The Auburn & Northern company is in bankruptcy and a mortgage of $250,000 is being foreclosed. The business of the railroads will be carried on by Mr. Cherry pending disposition of the cases.

Sale of Des Moines Road Ordered

Judge Martin signs decree under which property will be auctioned to satisfy creditors. Many interesting issues involved in managing the property

THE property of the Des Moines City Railway, Des Moines, Ia., in receivership since Nov. 11, 1927, was ordered sold in a decree signed on July 9 by Federal District Judge Martin J. Wade at Des Moines.

The sale was made contingent upon the failure of the company to pay debts of $1,759,152 within three days after the filing of the court's decree.

As a report just filed with the court by C. L. Herring and F. C. Chambers, receivers, showed only $118,000 on hand with which to satisfy the creditors, the three-day time limit set by the court was considered in the light of a legal formality.

E. J. Kelly, of the law firm of Miller, Kelly, Shuttleworth & McManus, Des Moines, was appointed special master to conduct the sale at a date to be fixed at the request of Chapman & Cutler, Chicago, attorneys for the Harris Trust & Savings Bank, trustee for holders of $700,000 of 7 per cent bonds upon which payment has been defaulted.

The bonds were dated March 28, 1922, and were payable April 1, 1927. The company had retired $82,000 of the bonds and had paid the interest up to the date of maturity, but was unable to refund the issue or meet the principle when it came due. However, since April 1, 1927, interest has accrued to the amount of $55,036.

Sale of the railway is subject to a first mortgage of $5,762,000 made Jan. 1, 1916, to secure an issue of 5 per cent, twenty-year gold bonds of which the Harris Trust & Savings Bank also is trustee. The company has canceled $941,000 of this obligation, leaving $4,821,000 outstanding. Interest charges of $241,050 annually on this issue have not been defaulted.

One of the most important aspects of the forthcoming sale in the eyes of the general public in Des Moines was declared to be the possible fate of the famous two-man car agreement signed by the men's union and the railway in 1915. Under this arrangement, entirely outside of the present franchise, the company agreed to use a motorman and a conductor on every car for 25 years.

Under the terms of the decree the master is authorized to sell the property of the company subject to agreement or not so subject. He is instructed to offer first "parcels A and B and C." Parcel A sets out the physical property. Parcel B enumerates several contracts necessary to the operation of the property, including the franchise with the city of Des Moines. Parcel C enumerates a number of miscellaneous contracts, leases, agreements and instruments to which the railway "is apparently a party, but which are not essential as constituting an integral part of the operating property." The two-man car agreement was listed under this classification.

If no offers are made for the three parcels, the master is instructed to offer only parcels A and B. As the company officials have stated repeatedly that the railway cannot operate at a profit as long as it is prohibited from instituting one-man car service, it is not considered likely that any purchaser will bid on the first offer.

Attorneys for the receivers hold that a sale will do away with the two-man car agreement as between the carmen's union and the purchaser. However,

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J. Ben Wiley, secretary of the union, who has successfully resisted all attempts so far to abolish the agreement, contends that the contract was made not only with the Des Moines City Railway but also with its "successors and assigns," and that it will be binding upon any purchaser of the property.

It is anticipated that the union will go into court for a decision on this point.

The necessary legal procedure and the advertisement of the date and terms of the sale will require several weeks, and it is not expected that the sale will be held before Sept. 1.

The court set no minimum amount as a reasonable sale price.

The property of the railway is valued at approximately $10,000,000. This includes tracks, overhead equipment, rolling stock, carhouses and the power plant, all said to be in first-class condition. There has been no appraisal since 1920 but railway officials pointed out that the $1,500,000 put into the system in recent years will more than offset any depreciation in the property.

The railway has operated under a 10-cent fare since July 18, 1925. On June 6, 1926, a Sunday pass selling at 25 cents, and good for unrestricted riding during the day, was instituted. On Sept. 20, 1926, the company instituted a weekly pass selling at $1.25 good for seven days of riding. This is still in effect, and affords regular car riders practically a 5-cent fare, as the average number of rides taken each week by passholders is slightly more than 26.

Records show that the company has operated at a deficit every month since May, 1926, with the exception of December of that year, and January, 1927.

$85,000 Betterment in St. Louis Earnings

A decrease of $77,854 in net operating income in 1927 as contrasted with the preceding year is shown by the report of the St. Louis Public Service Company. This reduction is in the face of an increase in fare averaging half a cent during the final six months of the year.

In 1926 the United Railways, predecessor of the St. Louis Public Service Company, showed a deficit of $46,400 while the past year the company had a net income of $38,217. However, this improvement in the financial showing of the company was due to the fact that during December, 1927, the funded debt was greatly reduced with a corresponding reduction in charges, since the St. Louis Public Service was then functioning as the successor company.

However, dividends on the new preferred stock, issued to the holders of the old St. Louis Transit Company 5s and possible payment on the new common stock, the proceeds of which went toward a reduction of the funded debt, also are still to be met out of the net operating income.

Had the old funded debt structure remained in effect for the entire year the deficit for the year would have been about the same as for 1926.

COMPARISON OF THE 1926 AND 1927 EARNINGS IN ST. LOUIS

	1927	1926
Railway operating revenue..	$18,860,716	$18,873,431
Railway operating expense, including depreciation....	14,680,522	14,626,828
Net railway operating revenue.....	$4,180,194	$4,246,583
Loss bus operation.....	10,545	.....
Net operating revenue....	$4,169,649	$4,246,583
Taxes.....	1,819,204	1,818,288
Net income from operation.....	$2,350,444	$2,428,295
Non-operating revenue.....	160,184	202,874
Total income.....	$2,510,629	$2,631,168
Interest funded debt.....	2,297,685	2,398,370
Interest loans notes payable	26,931	.....
Miscellaneous.....	15,998	29,782
Other expense.....	131,798	249,416
Net income.....	$38,217	*$46,400

* Deficit.

Berkshire Bond Extension Sought

Clinton Q. Richmond, president of the Berkshire Street Railway, Pittsfield, Mass., has asked the Massachusetts Public Utilities Commission to approve an extension for ten years at 6 per cent interest of $242,000 of bonds. The present rate is 7 per cent. The request was taken under advisement.

Balance in Grand Rapids $128,687

Results of operations of the Grand Rapids Railroad, Grand Rapids, Mich., for the first complete year since reorganization are shown in a statement for the twelve months ended April 30 as follows:

	1928	1927
Gross earnings.....	$1,632,505	$1,762,245
Operating expenses and taxes.	1,121,131	1,211,956
Gross income.....	$511,374	$550,289
Interest and other fixed charges	250,716	339,240
Profit.....	$260,658	$211,048
Accrued dividends on preferred	10,267	100,000
Provision for retirements.....	121,704	179,107
Balance.....	$128,687	*$68,059

*Deficit.

On the 100,000 shares of common outstanding, balance is equal to $1.28 a share.

Trust Company and Utility Form Investment Subsidiary

Formation of the Fidelity Union Stock & Bond Company by the Fidelity Union Trust Company and the Public Service Corporation of New Jersey was announced on July 6. The new company will take over the business of the Public Service Stock & Bond Company and that of the securities department of the Fidelity Union Trust. Its capitalization consists of 180,000 shares of $25 par stock to be issued at $50 a share. The Public Service Corporation will subscribe for 100,000 shares and the remainder will be taken by the trust company.

It is understood that common stockholders of the Public Service Corporation may participate in the subscription for the new stock in approximately the proportion of one share for each 40 shares of Public Service common held, and that shareholders of the Fidelity Union Trust will participate to the extent of one new share for every three shares now held.

J. Henry Bachellor will be chairman of the board of directors and Charles G. Colyer will be president. Other directors will include Uzal H. McCarter, William Scheerer, Edmund W. Wakelee, P. S. Young and Thomas N. McCarter.

E. H. Maggard Purchases Petaluma Line

Purchase of the Petaluma & Santa Rosa Railroad, Petaluma, Cal., by Edward H. Maggard, president of the Northwestern Pacific Railroad, was announced on July 5 by Mr. Maggard, who said the purchase price was approximately $1,500,000. He added that it was he, personally, who purchased the road and he who would operate it. Mr. Maggard was formerly president of the Petaluma lines before he left to assume charge of the Northwestern a year ago.

The Petaluma & Santa Rosa Railroad is 50 miles long, and connects Petaluma, Santa Rosa, Sebastopol, Forestville and other towns throughout Sonoma County. At present it connects with the Southern Pacific lines at Petaluma, providing through shipments to and from the East by way of the Southern Pacific lines. The road is an all-electric line and is one of the most profitable of the smaller lines of California, feeding, as it does, from one of the richest agricultural sections of the state. Mr. Maggard announced there would be no change in the operation of the lines under his ownership.

The purchase by Mr. Maggard recalls some interesting history centering about the Northwestern Pacific, Southern Pacific and Western Pacific lines.

The Northwestern is owned jointly by the Santa Fe and Southern Pacific. The Western Pacific is owned by Arthur Curtis James, who is also a large stockholder in the Great Northern and Northern Pacific, the Hill lines, which have been opposed by the Southern Pacific for several years in their efforts to extend their lines southward into California.

Six months ago the Northwestern filed with the Interstate Commerce Commission a request for a permit to buy the Petaluma lines. Immediately thereafter the Western Pacific protested, informing that body that it had been negotiating with the Petaluma lines for the purchase of the road for several months. An application was also filed for a permit to buy the lines. The commission set a date when both applications would be heard in San Francisco.

Although the permission of the Interstate Commerce Commission is necessary for one railroad to purchase another, there is no such restriction on an individual.

The sale of this property was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 17, 1927, page 1131.

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Book Reviews

Soil-Corrosion Studies

Bureau of Standards Soil Corrosion Studies. I—Soil, material and results of early observations. By K. H. Logan, S. P. Ewing and C. D. Yeomans. Published by the Government Printing Office, Washington, D. C., 1928. Price, 50 cents.

Technologic paper No. 368 of the Bureau of Standards is a résumé of studies of soil corrosion made over a considerable period, after a number of years of study of corrosion due to stray electric currents in the earth by the American Committee on Electrolysis and the Bureau of Standards. Since it became evident that in some cases the cause of corrosion could not be decided until it was known whether serious corrosion would occur in uncontaminated soil where no stray currents were present, the Bureau of Standards undertook to conduct an investigation of the relation of soil to the corrosion of pipe. The studies of soil corrosion were begun in 1922 and the field work has been planned so that specimens will be removed at about two-year intervals for a period of ten years. Of the specimens studied, about one-seventh have been removed for examination.

The work is therefore in its initial stage. The present bulletin sets forth in some detail its plans of scope of the investigation and publishes and discusses such data as are now available as a result of the investigation.

The data indicate that in certain regions soil corrosion is an active enemy of buried pipe lines, that the material best suited to resist the action of one soil is not necessarily the best for other soils, and that the use of some form of protective coating is desirable under a number of soil conditions.

Representative Industries in the United States

Edited by H. T. Warshow, comptroller National Lead Company. Henry Holt & Company. New York. 702 pages. Price $5.

A representative selection of manufacturing industries is here presented for the general reader of industrial and business problems. The study of the various industries is contributed by an authority in the field who covers its history, the conditions surrounding its origin in the United States, its relation to American industry as a whole, the growth of its domestic trade, the improvements in technological processes, the growth of its export business, a discussion of its labor problems, a brief history of large consolidations or combinations, and any special developments peculiar to the individual industries.

The chapter on the electric industry is contributed by L. A. Osborne. After a brief review of the electric car, Mr. Osborne states that although the growth of the automotive industry in recent years has restricted electric railway growth the trolley "still remains by far the best means for carrying large numbers of people rapidly and safely in towns and cities." He discusses the important railroad electrification projects and talks about the use of electric power for manufacuring purposes. William H. Woodin discusses the history of railway equipment.

The automobile industry is reviewed by A. R. Erskine, who touches upon commercial vehicle growth, regulation and legislation. Other subjects covered are copper, iron and steel, lumber and zinc.

Year Book, American Engineering Standards Committee, 1928

Published by the American Engineering Standards Committee, New York, N. Y., 87 pages.

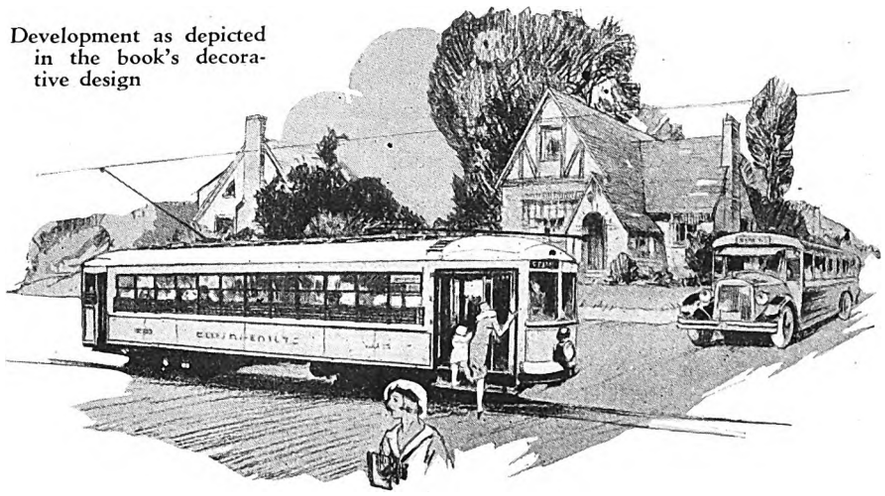
In its Year Book the American Engineering Standards Committee not only reviews briefly the work that it has accomplished during the year 1928, but also explains its method of working and its use of available facilities.

There are listed in the book all the projects that on April 15, 1928, had an official status before the American Engineering Standards Committee, including standards that have already been approved and also those publications that are available. Co-operating organizations, members and sustaining members are also listed.

Popularizing Public Transportation

A digest of presentations made by electric railways to the Charles A. Coffin Foundation, edited by Henry H. Norris with an introduction by W. H. Sawyer. American Electric Railway Association, New York, N. Y. 239 pages, exclusive of appendix and index. Price, $2.

OUTSTANDING accomplishments of public transportation companies contained in presentations made by them in 1927, under the Charles A. Coffin Award comprise the fifth book in the series of "Electric Railway Practices." This book presents evidence of the progress of modernization, both in equipment and in method. In this volume the activities of merchandising transportation, advertising, public relations, management, economies, maintenance, power, are set down to add another important chapter to the history of electric railway progress.



Development as depicted in the book's decorative design

Much initiative and resourcefulness are displayed in this array of accomplishments by companies which are overcoming the obstacles in the path of this forward movement in transport methods and are courageously and diligently buttressing an old foundation for future needs. Here is the inspiration for sister companies. As Mr. Sawyer points out in his foreword, as each department endeavors to find its own claims for recognition it is forced to review and compare its own performance with what has been done by other properties so the winners are not the only beneficiaries.

H. H. Norris, the editor, points out that twelve railways contributed to the success of the fifth competition. The salient features of the presentations are summarized in the report of the Charles A. Coffin prize committee, which forms an appendix to this volume. The report is signed by W. H. Sawyer, chairman, James H. McGraw and R. P. Stevens. Much space was given in the digest this year to evidence or testimony as to the substantial accomplishments of the co-operating railways. The material has been edited with a view to facilitating ready reference to the numerous helpful ideas contained within the book. It is suggested that the chapters of the book be used as the basis of discussions in conferences of electric railway of-

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ficials, and that every official familiarize himself with the text.

As in the case of "Making Transportation Pay," ("Electric Railway Practices" of 1926) outstanding characteristics of good electric railway practice are scattered throughout the chapters in some 31 boxes arranged at the bottom of pages in messages of telling effect. These are based on the text of the book and are a convincing epitome.

In commending the volume to the forward-looking railway executive Mr. Sawyer hopes that "it may be, in turn, as preceding volumes have been in the past, the means of stimulating the industry to even greater improvement and progress."

McGraw Central Station Directory, 1928

Published by McGraw-Hill Catalog & Directory Company, Inc., New York, N. Y 946 pages. Price, $25.

This new, thoroughly revised edition furnishes data on approximately 150 holding companies, 4,000 operating companies, 4,500 plants, and 12,000 managerial and operating officials. There are to be found more data on plants, more data on the territory served by each operating company, more data on company ownership and inter-relation and complete listings of managerial and operating personnel. In addition, new features cover the starring (*) of all holding companies, both in the alphabetical index and in their geographical entries—the listing of all towns served under each operating company—the inclusion of the names of merchandising managers and the addition of state headings.

"Electrician" Annual Tables of Electricity Undertakings

Published by Ernest Benn, Ltd., London. 200 pages. Price 10/9.

This is the 41st edition of electricity undertakings and includes details of projected schemes. Contents cover colonial electric railways and tramways and foreign electric railways and tramways. The statistics relate to more than 800 British and more than 1,300 colonial and foreign undertakings. The publication is of value to all engineers, manufacturers and contractors in the electrical industry and to exporters of and dealers in electrical plant and apparatus.

Railroad Financing

By Mortimer L. Schiff. Extracts from a speech delivered before the New School for Social Research, Dec. 7, 1927. 56 pages.

The contents of this pamphlet cover capital needs, reorganizations and public regulation of security issues. In concluding his dissertation Mr. Schiff said he did not believe competitive bidding was to the interest of either the borrowing corporation or the investing public. Although his remarks referred to steam road financing, they were interesting to electric railway men.

Personal Items

A. J. Stratton Has Added Responsibilities

A. J. Stratton is serving, in addition to his duties with the Southern New York Railways, Mohawk, N. Y., as general manager of the Railway and Bus Associates, a company covering all Associated Gas & Electric System transportation activities. Mr. Stratton is a specialist on track construction. For many years he was engaged in engineering work with the J. G. White Management Corporation and at the same time carried on the work of superintendent of maintenance-of-way of the various lines associated with the Eastern Pennsylvania Railways. At one time he was affiliated with the Mobile and the Binghamton properties; from 1916 to 1918 he was assistant engineer of way and structures of the Brooklyn Rapid Transit Company and from 1918 to 1920 was assistant engineer of the valuation department of the Metropolitan Edison Company, Reading., Pa. On Jan. 1, 1922, Mr. Stratton was made assistant superintendent of the Eastern Pennsylvania Railways and six months later he transferred to the Southern New York Railways.

More Appointments on Illinois Terminal

In addition to the officers of the Illinois Terminal Railroad mentioned in ELECTRIC RAILWAY JOURNAL, issue of June 16, 1928, the following appointees and their headquarters were announced:

H. G. Powell, traffic manager, steam lines, Alton, Ill.

H. A. Tuohy, traffic manager, electrified lines, St. Louis, Mo.

E. L. Bodge, coal traffic manager, with headquarters 1221 Locust Street, St. Louis, Mo.

E. E. Kester, assistant traffic manager, Springfield, Ill.

W. H. Blair, general freight agent, St. Louis, Mo.

J. A. Gorman, chief tariff bureau, St. Louis, Mo.

Eldon Tyler Promoted to Porto Rican Post

Eldon Tyler, assistant chief engineer of the Jacksonville Traction Company, Jacksonville, Fla., has been transferred to Ponce, Porto Rico, as chief engineer of the Ponce Electric Company. The Ponce Electric Company is under the executive management of Stone & Webster, Inc. Mr. Tyler was sent to Jacksonville three years ago from the Eastern Texas Electric Company, at Port Arthur, Tex. He was maintenance engineer there and went to Jacksonville as assistant to John C. Higgs, chief engineer.

Ernest A. Wilkerson, maintenance engineer at Jacksonville, will succeed Mr. Tyler. He has been employed by the Jacksonville Traction Company for ten years.

C. A. Norris, watch engineer of the Jacksonville station, will succeed Mr. Wilkerson as maintenance engineer.

F. E. Schmitt Editor of *Engineering News-Record*

Frederick E. Schmitt, managing editor, has just been appointed editor-in-chief of *Engineering News-Record*, a McGraw-Hill publication, the chosen instrument of information of thousands of engineers and constructors. A statement by James H. McGraw says in part:

The publishers are not unmindful that their task has been an important one—that of selecting and training the men who could deserve this splendid acceptance and support. It is in further performance of this responsiblity that this announcement is made. A successor is needed to the late Frank Wight, of enduring memory, who will worthily carry on the virile work of a line of eminent predecessors.

In appointing Mr. Schmitt, the publishers do so without any faltering or misgivings. He has won his spurs by a long and brilliant journalistic career. He has the confidence of engineers and constructors. He has the ardent support and loyalty of his associates on the staff. We pass to him the mantle of Stauffer, of Wellington, of Baker, of Goodell, of Mehren and of Wight in the full confidence that he will carry the paper to new heights and that our action, in making him editor, will have the hearty approval of the reader.

H. A. Mullett With Manufacturing Concern

H. A. Mullett, prominent in railway and bus fields, and in manufacturing circles identified with those industries, recently purchased the controlling interest in the Bradley Washfountain Company, Milwaukee, Wis., and on July 2 was elected president and general manager.

Early in his career, Mr. Mullett was associated with the Westinghouse Electric & Manufacturing Company at Pittsburgh, Pa. Later he joined the Milwaukee Electric Railway & Light Company as assistant to the superintendent of equipment. The rôle of superintendent he filled from 1911 to 1918. In the latter year he became assistant general manager of the company's city, interurban and bus transportation departments, and a year later his jurisdiction was extended to the company's newly created city and interurban bus divisions. Some few years later, when the Milwaukee property acquired control of the Milwaukee Northern Railway, Mr. Mullett was made vice-president and general manager in charge of operations of that

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company. He has also been identified with the Yellow Cab Company in Chicago and with the Twin City Rapid Transit Company of Minneapolis.

Mr. Mullett was born in Louisville, Ky., and was educated in the public schools in Kansas City. He was graduated from Rose Polytechnic Institute.

The Bradley Washfountain Company, of which he is the head, manufactures a circular and semi-circular wash fixture for use in industrial establishments, schools, and institutions of all kinds.

Obituary

Robert I. Todd

President of properties centering at Indianapolis and former head of American Electric Railway Association died suddenly of heart attack on eve of committee meeting he had come to New York to attend

ROBERT I. TODD, former president of the American Electric Railway Association and long connected with the Indianapolis Street Railway, Terre Haute, Indianapolis & Eastern Traction Company and other roads centering at Indianapolis, died suddenly in New York on July 13. Mr. Todd had come to New York to attend the meeting of the executive committee of the association scheduled to be held the day he died. He was stricken with a heart attack on his return to his hotel after having visited with his sister.

Mr. Todd was an engineer turned executive. He entered the electric railway field while still a student at the Johns Hopkins University and lived through two periods which saw tremendous changes in the history of local transportation. The trolley was only just beginning to come into its own when Mr. Todd as a fledgling engineer spent his summers in helping to install the electric railway at Raleigh, N. C., one of the earliest lines of its kind in the country. That, of course, was most interesting, but as it turned out the work he did there was strange by contrast with problems he later was called upon to handle, first, in developing the city and interurban lines at Indianapolis, and then in adjusting these lines to the changed economic situation which followed the advent and the intensive development of the bus both in city and suburban operation.

So far as Indianapolis is concerned, the situation there has been materially bettered by the co-ordination of bus and trolley under one management, but the effort to bring about co-ordination required the exercise of a great deal of managerial skill. It was attained only after long negotiations in which the futility of competition in local transportation was brought home forcefully to the people of Indianapolis. So far as the interurbans under his direction are concerned, negotiations under way at the time of Mr. Todd's death are expected to result in a new alignment of these properties intended greatly to enhance their value as common carriers.

Like many other operators who carried through the war-time period, Mr. Todd found himself confronted with problems for which there was no precedent either in the annals of management or in the history of the play of economic forces as they affected business. The most important of the city roads of which he was the head, the one in Indianapolis, was sorely beset because of the long delay in affording the company a measure of relief in the form of an increase in fare, to which stout resistance was experienced from opponents with political axes to grind. Through it all, however, Mr. Todd retained the courteous composure that endeared him to his host of associates, reflected in turn by them in his election to some of the most important posts it was within their power to bestow, among them, in addition to that of head of the American Association, the presidency of the Central Electric Railway Association and the presidency of the American Electric Railway Traffic and Transportation Association.

Robert I. Todd

Mr. Todd was born on Nov. 29, 1869, at Lakewood, N. J. He was educated in the public and private schools of New Jersey and Virginia and was graduated from the Johns Hopkins University in 1893 with the degree of electrical engineer. As indicated previously, Mr. Todd while still a student at that university became affiliated with the railway field, spending his summer vacations in the employ of the railway at Raleigh, N. C. After his graduation he was at first employed by the Eckington & Soldiers' Home Railway, Washington, D. C. This was later consolidated into the City & Suburban Railway and still later into the Washington Railway & Electric Company, of which he served as superintendent and electrical engineer.

In 1899 he left Washington to become connected with the Compressed Air Company, then undertaking the development of compressed air for use on the Metropolitan Street Railway, New York City. Later he did engineering work under M. G. Starrett, at that time chief engineer of Metropolitan company. In 1900 he went to Pittsburgh as mechanical engineer in charge of shops and power houses of the Pittsburgh Consolidated Street Railway, now included in the system of the Pittsburgh Railways.

In the latter part of 1901 Mr. Todd was chosen vice-president and general manager of the Cincinnati Traction Company, but he resigned this position early in 1903 to assume general supervision of the engineering work of the electric railway properties of the United Gas Improvement Company, Philadelphia, Pa. In the following year he was appointed general manager of the Rhode Island Company, Providence, R. I., where he served until 1906, when he went to Indianapolis to become vice-president and general manager of the Indianapolis Traction & Terminal Company and the Terre Haute, Indianapolis & Eastern Traction Company. Following the death of Hugh J. McGowan in 1911, Mr. Todd was elected president of these two companies, the former now being known as the Indianapolis Street Railway.

Among his other activities Mr. Todd this year was a member of the membership committee of the American Electric Railway Association, the joint committee of that association on the national utility associations and the motor vehicle information committee of the A.E.R.A.

HOWARD ELLIOTT, one of America's greatest railroad executives, and an authority on both the practical operation of a railroad and the management of its finances, died in Dennis, Mass., on July 8. He was formerly president of the New York, New Haven, & Hartford and the Northern Pacific Railroad. Mr. Elliott was well known for his successful rehabilitation of the New Haven Railroad. Early in his career he worked as level rodman with the Chicago, Burlington & Quincy in northwest Missouri. This was during the summer between his junior and senior years in the Lawrence Scientific School of Harvard University, from which he took the degree of civil engineer in 1881. Mr. Elliott was born in New York City 67 years ago.

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Manufactures and the Markets

$313,100 Carhouse Improvements for St. Louis

The Public Service Company, St. Louis, Mo., plans to expend $313,100 in improvements and alterations at its DeBaliviere Avenue carhouse, including the reconstruction of double track on DeBaliviere from Pershing to Delmar, to cost $35,000; wrecking present wash house and repair shop and making alterations to south bay of west carhouse for repair shop and wash house, $73,800; removing special work on DeBaliviere in front of car yard and constructing new track layout on property, $141,300, and a new office building, $63,000.

The plans call for 25 tracks for the handling of cars into and out of the carhouse.

Into this track enclosure there will be an entrance at Delmar Boulevard and Laurel Avenue and two exists on Delmar Boulevard near DeBaliviere and one on DeBaliviere south of Delmar Boulevard. Providing for the movement of cars always in one direction.

The old station structure will be torn down and the new building will be erected south of the present station and nearer the center of the network of tracks for handling of cars. This building will be most complete and up-to-date, and will have many conveniences for employees, such as shower baths, a tailor shop and barber shop.

Community Traction May Buy Buses

Community Traction Company, Toledo, Ohio, in connection with the negotiations for a new operating plant has come into possession of about 40 buses used previously by independent operators, but while some of these vehicles may meet the requirements of the railway it is indicated that probably 50 new buses will be needed to fill the complement of vehicles of this kind to meet the requirements of the service which the railway has in mind to furnish.

Underground Work for Vancouver

Work on the construction of over 10 miles of underground subways involving an expenditure of approximately $138,000 is either under way or about to be commenced by the British Columbia Electric Railway, Vancouver, British Columbia.

The contract has just been awarded to J. O. McCable, 3442 Eleventh Avenue West for the construction of an underground subway between Cordova and Georgia Streets on Homer Street and the work will commence immediately. The ultimate expenditure on this project will be approximately $25,000. When the subway is completed 12,000-volt high tension cable will be pulled through.

In addition to this, construction of an underground subway containing two new circuits running from Haro Street substation is nearing completion and the work of pulling the cable through is about to be commenced. This subway will be over 2 miles in length.

Over 8 miles of cable is being pulled through subways which are under construction in the vicinity of the Main Street substation. This work will involve an expenditure of approximately $85,000 for the cable work alone, and should be completed by Sept. 1. The cables which are being pulled through the subways from this station include both light and power feeders and railway feeders.

Door Checks for New York Subway

The Transit Commission has announced its approval of the purchase by the Interborough Rapid Transit Company, New York, of some $22,000 worth of gravity door checks to be installed on nearly 2,000 subway cars. These checks will be attached to the top of the end vestibule doors and are designed to prevent the doors from slamming shut when the train takes a curve or lurches for any reason. These checks have been developed by the railroad.

Northern Ohio Improvements

Considerable new track is to be installed this summer by the Northern Ohio Power & Light Company, Akron, Ohio. Double track is to be laid on Main Street from Crosier to Long Streets. The improvement will cost approximately $20,000.

Another improvement on Main Street is from State to Mill, where new double track will be laid to join the new track to the south put down in 1927.

On East Market from the point where Exchange crosses to a point near the intersection of Carroll Street new track will also be laid.

Another improvement in Akron, is the installation of seven safety zones instead of the present loading platforms. These zones will be inclosed with steel posts and lighted similar to the Cleveland plan, the platforms being removed.

A new transfer freight station will be built at Ravenna Junction to facilitate the handling of freight from the Alliance district to points in the Warren, Youngstown and other districts.

The installation of new track on Second Street, Cuyahoga Falls, from Wetmore to North Streets will soon be started. This will be the standard type of construction and will be double track costing about $50,000.

Tracks are to be torn up on Payne Avenue from the Silver Lake Junction carhouse to Notre Dame Avenue and new paving laid with double tracks. This means an expenditure of some $70,000. The entire street is to be improved. At the same time the tracks entering the carhouse at the junction will be rearranged and special work installed.

Wage Earnings Slightly Higher

Monthly inquiries by the National Industrial Conference Board permit an inspection of the general tendency of wages and living cost for the first few months of this year.

Hourly earnings show very little fluctuation and are gradually rising, the average hourly earning for the first two months of 1928 being only one-tenth of 1 cent higher than for the similar period of 1927. The money weekly earnings, however, show considerable fluctuation. The money weekly earnings for the first few months of 1928 are actually 9 cents below the weekly earnings for the same period of 1927. Variation in the number of hours actually worked each week accounts for the apparent decrease in weekly earnings for 1928 as compared with 1927.

While in wages there has been noted a very slight upward trend in recent months, in the cost of living the contrary has been the case. In the first quarter of 1927 the cost of living relative to conditions during 1914 stood at a level of 165.4, and in the first quarter of 1928 at a level of 162.9. All of the major items that enter into the cost of living decreased from 1927 to 1928. The greatest decrease occurred in rent, which dropped about 4 per cent.

This subsidence in the cost of living, combined with approximately stationary earnings, has brought about an appreciable upward movement of real earnings.

The record for the year so far, shows that the wage earner in manufacturing industries is holding his own, and possibly, in a slight degree, has improved his position. It would also seem that the unemployment condition that existed in the latter part of 1927 was magnified, as it has not betrayed itself in a lowering of wages.

Industrial Building Maintains Lead Over 1927

New industrial building construction —physical plant expansion—is an excellent index of business confidence. Companies do not authorize new factories, power plants, or extensions to existing plants, unless they believe they can use them in added production.

Contracts for industrial building construction in 28 industries in the first

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five months of this year total $124,693,000, compared with $97,947,000 in the similar period of 1927. There were 599 of these contracts, compared with 575 last year. The average value of the 1928 job is $208,158, against $170,342 in 1927. The public utilities group is the leading industry with 53 jobs valued at $23,000,000, which is almost the exact figure for 1927.

The expansion of plants has been quite general, with large increases in the following lines: Paper and pulp, heavy chemicals, manufactured gas. rayon, glass, automotive and refrigeration. All sections of the country, except the Far West, shared in this increased activity in industrial building. Very substantial gains were recorded in New England, the Middle Atlantic States, the South and the region between the Mississippi and the Rocky Mountains.

Isothermos Corporation Formed

Formation of an American corporation to manufacture to American standards the Isothermos journal box, which is now in use on a number of European, African and South American railroads has been announced. The American company is known as the Isothermos Corporation of America, and has its permanent executives offices at 11 West 42nd Street, New York City. The officers and directors of the new corporation are Hubert E. Rogers, president, Rogers & Whitaker, Attorneys-at-Law, 52 Wall Street, New York; A. De Bac, vice-president, chairman of the Societe Internationale Isothermos, Geneva, Switzerland; Dr. F. H. Hirschland, treasurer, president Metal & Thermit Corporation, 120 Broadway, New York, and Spier Whitaker, Rogers & Whitaker, Attorneys-at-Law, 52 Wall Street, New York, and F. O. Willhofft, secretary de la Banque Francaise de l'Afrique, Paris, France.

General Electric Disposes of Subsidiary

According to a joint announcement made by the General Electric Company and the Industrial Acceptance Corporation, the latter has acquired from the former the entire capital stock of General Contract Purchase Corporation, New York, its instalment financing subsidiary as well as its affiliated contract purchase corporations in Boston, Cleveland, Chicago, Dallas and San Francisco.

Arthur J. Morris will be chairman of the board of directors and Percy M. Hall chairman of the finance committee. E. W. Miner, who has been president of the General Contract Purchase Corporation and managing director of its associated companies, continues as president and general manager. Frank J. Scott, vice-president of the Industrial Acceptance Corporation, becomes executive vice-president, and Clinton T. Miller becomes vice-president and controller.

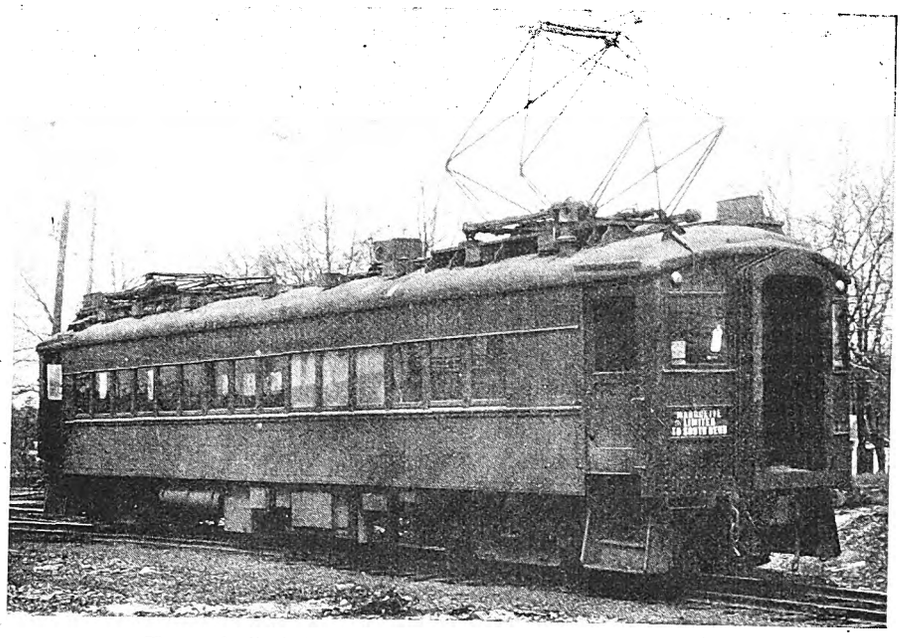
Electric Locomotive Shipments Slightly Lower

Domestic shipments of electric locomotives during the first six months of this year were 76 as compared with 85 locomotives shipped during the similar period in 1927. Foreign shipments during the first six months this year were only two while seven were shipped in the first six months of last year. The total shipments for the year

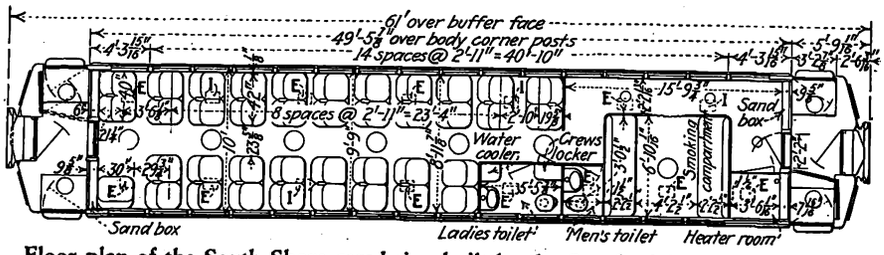
Ten Units Being Built for South Shore Line

Ten interurban, two-man, motor-passenger cars are being built for the Chicago, South Shore & South Bend Railroad, Michigan City, Ind., by the Standard Steel Car Company, Hammond, Ind. The cars, ordered on May 7, will be delivered in November. They are of the double-end, double-truck type, seating 48 passengers.

The new cars will be identical to the Pullman-built units delivered last year except for the elimination of the wooden partition and swing door separating the corridor leading around the smoking compartment from the main seating compartment. The lamps will be operated from a 32-volt battery which will be charged by a motor generator set.



Type of all-steel passenger car being built for the Chicago, South Shore & South Bend Railroad



Floor plan of the South Shore cars being built by the Standard Steel Car Company

Weights: Car body	67,500 lb.
Trucks	33,400 lb.
Equipment	32,700 lb.
Total	133,600 lb.
Bolster centers	38 ft.
Length over all	61 ft.
Length over body posts	49 ft. 6½ in.
Truck wheelbase	7 ft.
Width over all	10 ft. 1½ in.
Height, rail to trolley base	13 ft. 1 in.
Window post spacing	35 in.
Body	All steel
Roof	Arch
Doors	End swinging
Air brakes	Westinghouse AMU
Armature bearings	Plain
Axles	Standard Steel Co. 5½ x 10 in.
Car signal system	32-volt bell
Compressors	Westinghouse D3F, 1500-volt
Conduit	Metal
Control	Westinghouse type HBF, 1500-volt
Couplers	Ohio Brass Co. No. 23
Curtain material	Pantasote
Destination signs	Hunter
Energy saving device	Economy meter
Finish	Duco
Floor covering	Linoleum (rubber in aisle and smoking compartment)
Gears and pinions	Westinghouse BP
Glass	Plate
Hand brakes	Peacock staffless
Heat insulating material	Balsam wool
Heaters	Peter Smith hot water and Railway Utility Co. electric
Headlights	Portable
Headlining	⅛-in. aluminum
Interior trim	Mahogany
Journal bearings	Plain, 5½ x 10-in
Journal boxes	Symington semi-steel
Motors	Four Westinghouse No. 567-C, inside hung
Painting scheme	Orange and maroon
Roof material	Wood with canvas cover
Safety car devices	Deadman control
Sash fixtures	Brass
Seats	Hale-Kilburn No. 900
Seat spacing	35 in.
Seating material	L. C. Chase Byzantine plush (leather in smoking compartment)
Slack adjusters	Form J
Steps	Stationary
Step treads	Irving Iron Works Safkar
Pantograph	No. 515-C
Trucks	Baldwin equalizer bar type
Ventilators	Railway Utility Co.
Wheels, type	Rolled steel, 36 in. diameter
Wheelguards or fenders	Steel pilot
Special devices	32-volt lighting circuit
Pullman type smoking compartment	

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1927 were 148 domestic and 29 foreign. The unfilled domestic orders in June, 1928, numbered 37 while last year the unfilled domestic orders in June were 31.

Oudin Decorated by King of Italy

Maurice A. Oudin, vice-president of the International General Electric Company, who has returned from an extended visit in Europe, was signally honored by the King of Italy. In recognition of his good offices in behalf of a closer international relationship and of the specific benefit to the engineering profession of Italy, Mr. Oudin was decorated with the Order of Commander of the Crown of Italy. Mr. Oudin is president of the board of trustees of the Italy-America Society of New York, and has been active in promoting the technical and industrial relations between Italy and the United States.

ROLLING STOCK

DELAWARE ELECTRIC POWER COMPANY, Wilmington, Del., has just ordered ten one-man, two-man, double-truck, double-end cars from the J. G. Brill Company. Mention of the request for bids on these cars was made in the June 16 issue of the JOURNAL.

CALGARY MUNICIPAL RAILWAY, Calgary, Alberta, has been recommended by A. G. Graves, commissioner, and R. A. Brown, superintendent, to purchase three new passenger cars and one new power snow sweeper. The snow sweeper is for next winter but the cars may not be ordered until next year.

LINCOLN TRACTION COMPANY, Lincoln, Neb., is rebuilding its cars. Among the improvements to be made are leather seats and new ceiling lights.

READING TRANSPORTATION COMPANY, Reading, Pa., has taken delivery of five Mack special six-cylinder, 29-passenger, city type buses.

LOS ANGELES RAILWAY, Los Angeles, Cal., has ordered two, double-deck, six-cylinder, Fageol safety coaches.

UNITED ELECTRIC RAILWAYS of Providence, R. I., has purchased another gas-electric drive urban type Twin Coach.

TRACK AND LINE

MANITOBA EASTERN RAILWAY, a subsidiary of the Winnipeg Electric Company, Winnipeg, Manitoba, is planning an electric railway from Whitemouth to the Seven Sisters Falls and Lac Du Bonnet in the central Manitoba mining area, according to an unofficial announcement.

OCEAN CITY ELECTRIC RAILROAD, Ocean City, N. J., is extending its tracks from the old boardwalk to the new esplanade.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINER.

Metals—New York	July 10, 1928
Copper electrolytic, cents per lb.	14.525
Copper wires, cents per lb.	16.625
Lead, cents per lb.	6.2
Zinc, cents per lb.	6.55
Tin, Straits, cents per lb.	46.25
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, .o.b. vessel, Hampton Roads, gross tons	4.15
Somerset mine run, f.o.b. mines, net tons	1.825
Pittsburgh mine run, Pittsburgh, net tons	1.775
Franklin, Ill., screenings, Chicago, net tons	1.625
Central, Ill., screenings, Chicago, net tons	1.5
Kansas screenings, Kansas City, net tons	2.25
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	5.3
Weatherproof wire base, N.Y., cents per lb.	17.125
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bb lots) N. Y., cents per lb.	10.3
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.75
Turpentine (bbl. lots), N. Y., per gal.	$0.61

WORCESTER CONSOLIDATED STREET RAILWAY, Worcester, Mass., has started the reconstruction of 1,122 ft. of track on Southbridge Street from Hammond Street to Quinsigamond Avenue. This job will require 35 tons 7-in. 103-lb. girder; 40 thermit joints; 600 ties; eight kegs of spikes; 1,200 tie plates; 2,000 tie rods and 1,122 sq.yd. paving. The estimated cost of this job is $14,548.

WINDSOR, ESSEX & LAKE SHORE RAPID RAILWAY, Kingsville, Ontario, will be requested to build a 400-ft. siding for the new shipping shed of the Kingsville Fruit Growers' Association.

KANSAS CITY PUBLIC SERVICE COMPANY, Kansas City, Mo., is constructing a car loop at Eighteenth Street and Central Avenue, at a cost of approximately $50,000.

OREGON ELECTRIC RAILWAY, Portland, Ore., announces that the proposed extension in Linn County, Oregon, is estimated to cost $3,004,062. The line will be approximately 40 miles long.

SHOPS AND BUILDINGS

BRITISH COLUMBIA ELECTRIC RAILWAY, Vancouver, British Columbia, is constructing a new station and freight shed to replace those destroyed in the recent fire at Langley Prairie. The work will involve an expenditure of approximately $3,100.

MENOMINEE AND MARINETTE LIGHT & TRACTION COMPANY, Menominee, Mich., will move its Mission Point Building a distance of 130 ft. to make way for the new interstate bridge.

SASKATOON MUNICIPAL RAILWAY, Saskatoon, Saskatchewan, is making plans for a carhouse addition.

ATLANTIC CITY & SHORE RAILROAD, Atlantic City, N. J., will erect a waiting room on the boardwalk at Eighth Avenue.

MONTREAL TRAMWAYS, Montreal, Quebec, will extend its St. Henry Street garage at a cost of about $25,000.

GRAYS HARBOR RAILWAY & LIGHT COMPANY, Aberdeen, Wash., has received a permit from the city engineer to construct a building costing $135,000 as part of a $1,000,000 extension project of the company's plant at Electra Park.

WISCONSIN PUBLIC SERVICE CORPORATION, Milwaukee, Wis., is reconstructing its Green Bay substation.

TRADE NOTES

CHARLES G. MELVIN, formerly with the Galena Oil Company has been appointed New York sales agent of the Griffin Wheel Company, Chicago, Ill. Arthur Hale, vice-president of the company is changing his headquarters from New York to Chicago.

PITTSBURGH TESTING LABORATORY, Pittsburgh, Pa., has just opened an office in Boston at 101 Tremont Street, which office is in charge of Donald L. Macdonald, formerly connected with the engineering department of Stone & Webster.

GIBB WELDING MACHINES COMPANY, Bay City, Mich., has increased its capital stock by $125,000, making a total of $250,000.

VAN DORN ELECTRIC TOOL COMPANY, Cleveland, Ohio, announces that its sales branches in Los Angeles, San Francisco and Seattle, and service branches in Los Angeles, Oakland and Seattle, have been supplemented by the establishment of a complete warehousing and service depot at 525 East Tenth Street, Oakland, Cal.

W. C. GOODWIN, formerly section engineer of the control engineering department, has been appointed manager of the renewal parts engineering department of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. In August, 1926, Mr. Goodwin went to England as liaison engineer for the Westinghouse Company with European companies with which the Westinghouse Company has relations. He represented the Westinghouse engineering department in Europe for almost two years, spending time in England, France, Italy, Norway, Germany and Czecho-Slovakia.

ADVERTISING LITERATURE

CROUSE-HINDS COMPANY, Syracuse, N. Y., has published bulletin No. 2111 entitled "Plugs and Receptacles."

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, East Pittsburgh, Pa., has issued a 24-page circular, C-1787, on electric equipment for railway signaling.

WAGNER ELECTRIC CORPORATION, St. Louis, Mo., has just issued a new bulletin on Wagner bearing construction, in which the Wagner improved sleeve bearing and the Wagner ball bearing construction are fully described and illustrated.

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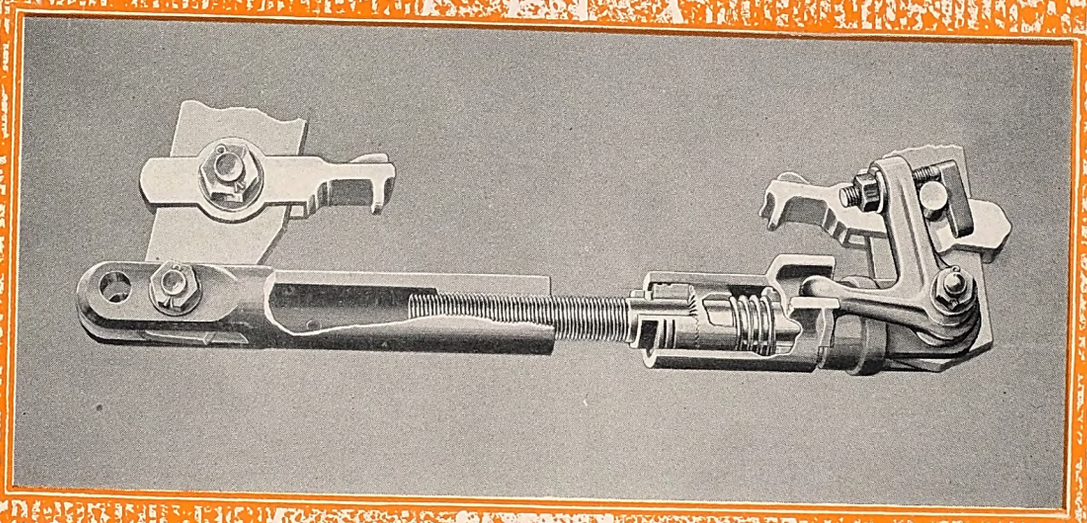

Test the Brill Slack Adjuster On Your Own Cars

The Brill Mechanical Slack Adjuster automatically maintains and equalizes the proper clearance between the brake shoes and wheels of trucks, thus eliminating all hand adjustment.

The result is fewer accidents, a considerable reduction in maintenance costs, a saving in power and less wear and tear on the brake rigging. More positive control and smoother car operation are also made possible.

Try out the Brill Mechanical Slack Adjuster on your own cars. Test it to your own satisfaction. Let us send you a car set for test purposes, on a ninety-day consignment.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

Brill Mechanical Slack Adjuster

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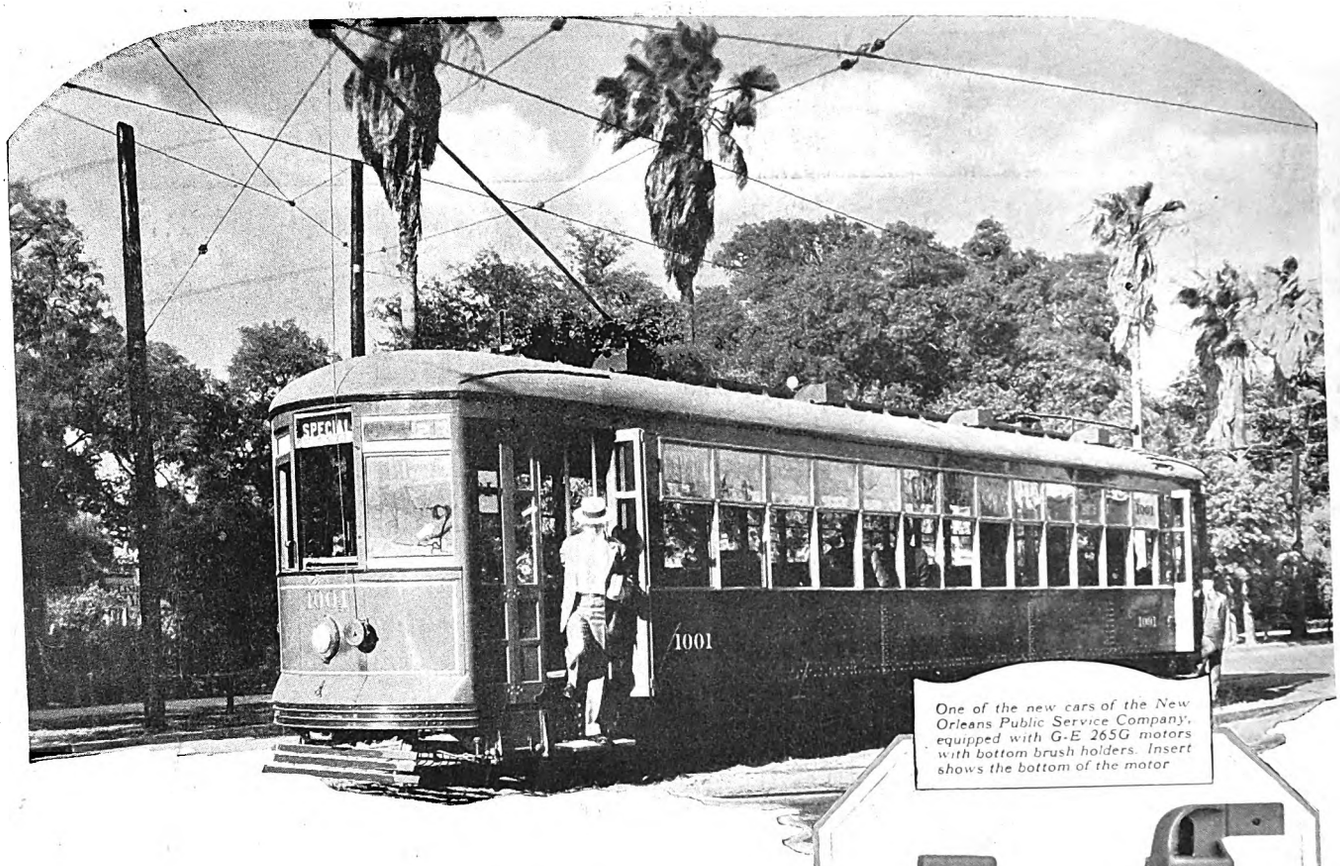
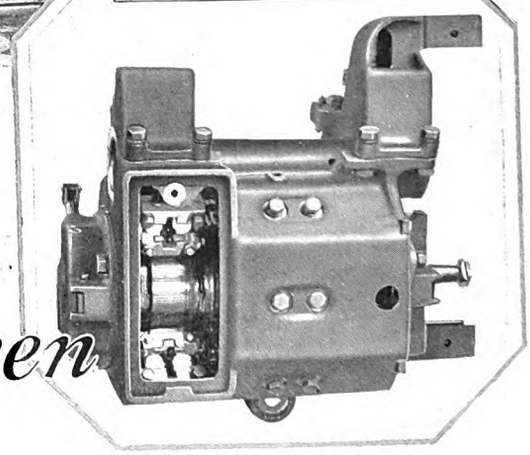


One of the new cars of the New Orleans Public Service Company, equipped with G-E 265G motors with bottom brush holders. Insert shows the bottom of the motor



Put your brushes where they can be seen

The new GE-265 motor with bottom brush holders has many advantages. Among these are accessibility for brush inspection, adjustment, and replacement, and longer life because of better protection from dirt.

When these motors are used, there is no need of a trapdoor in the floor of the car. The floor will not be disfigured, nor will there be any danger of grease and dirt on expensive floor or seat coverings.

The brushes last longer, too, because they are farther removed from dirt brought in at the top of the motor by the ventilating air, and they are plainly visible from a pit for inspection and adjustment.

As fast as new conditions develop and new problems arise, General Electric offers new equipment and new methods to meet the need.

330-86

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

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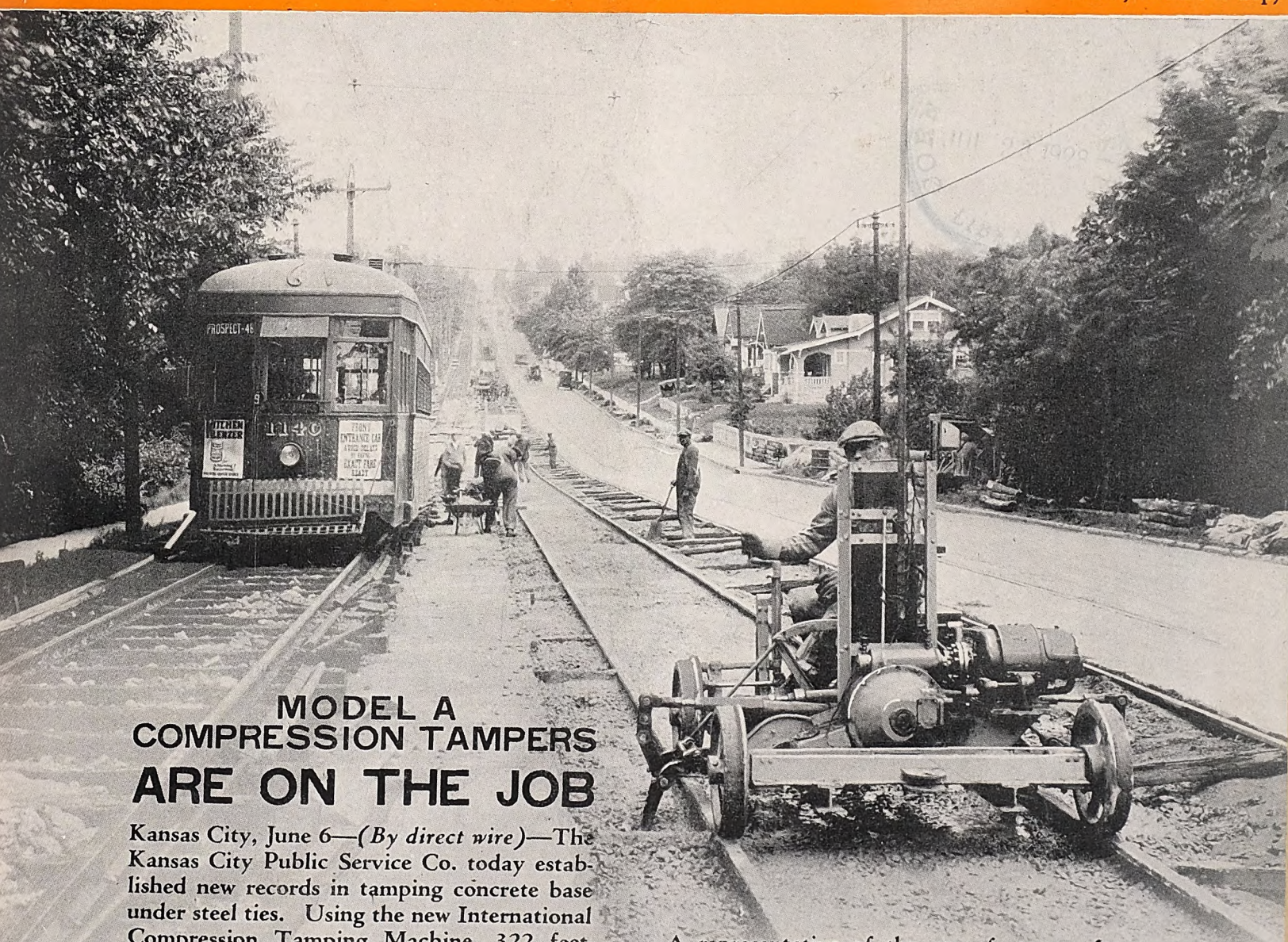
MAINTENANCE AND CONSTRUCTION ISSUE

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. JULY 21, 1928 Twenty Cents Per Copy



MODEL A COMPRESSION TAMPERS ARE ON THE JOB

Kansas City, June 6—*(By direct wire)*—The Kansas City Public Service Co. today established new records in tamping concrete base under steel ties. Using the new International Compression Tamping Machine, 322 feet were completed on Prospect Ave. in 3½ hours with four less men on the job. On Independence Ave. 725 feet were completed in 7 hours with 50% less labor. Local railway officials were surprised and gratified at the exceptional quality of the work done.

A representative of the manufacturer of this machine said that the Electric Railway Industry has definitely taken up mass production methods in paved track construction and that production schedules on the new compression tampers are being speeded up to meet the unusual demand for them.

THE INTERNATIONAL STEEL TIE CO.
CLEVELAND, OHIO

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Valves to the Heart of Your Motor!

Modern motors demand good commutation. Brushes are the only electrical connections on your motors not soldered or bolted. They function as valves to the heart of your motor. These valves must be properly applied and form an integral part of motor design to function properly. Let the Westinghouse engineers scientifically solve your brush problems.

Westinghouse Electric & Manufacturing Company
East Pittsburgh *Pennsylvania*

Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA 1928

Westinghouse Carbon Brushes

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of Street Railway Journal and Electric Railway Review
CHARLES GORDON, *Editor*

LOUIS F. STOLL, *General Manager*

Volume 72 New York, Saturday, July 21, 1928 *Number 3*

Endurance Records in the Line Department

NUMEROUS reports in the newspapers of the spirit of competition that is hanging up new endurance records for non-stop airplane flights find their counterpart in the electric railway industry. In this field it is an endurance record in keeping the cars running, but the methods that are pursued are somewhat different. With a complete change from the attitude of the old days when the problem was to make repairs when the system broke down, the maintenance forces now are vying with one another in seeing how long the cars can be kept in service without a failure in any department.

It was something more than a year ago that the men of the emergency division of the United Railways & Electric Company of Baltimore were tendered a dinner by the management on the completion of 58 days without a trolley break. The event was hailed as a new mark in reliability. Now the Cleveland Railway's line division has bettered this record, having gone 60 days without a break. These men, too, earned a dinner, and the account of it, published recently in this paper, shows that they were not unmindful of the honor that comes with such a record.

How long it will be until some other maintenance force takes away this record by running a comparable system for a longer time without a broken trolley wire remains to be seen. There is no reason why it cannot be done. The difficulties of keeping the wires intact are as great in Cleveland and Baltimore as they are in other cities. Perhaps these same forces may better their own achievements and set up new records for themselves.

Day Is Better than Night for Inspection

FOR many years there has been a tendency to reduce the amount of night inspection in American electric railway carhouses. The present practice is to do at night only car cleaning and such emergency work as is absolutely necessary to keep the cars running. All regular inspections and repair work are done in the daytime. The latter method has been found more efficient and economical. A plan of this kind permits work to be handled with an inspection force of minimum size and allows the employment of high-grade men who are specialists in their lines and who have been carefully instructed. In the larger inspection shops such an expert is placed at the head of each department to direct the activities of the men under him.

Doing away with night work has reduced materially the amount of pit space needed to facilitate inspection. Under the old plan it was necessary to place all cars due for inspection on the pits as they came in from their runs, since the storage space was crowded and there was little opportunity for shifting. With day inspection the proportion of cars that can be placed over the pits at one time is only about 10 per cent of the total rolling stock. In a recent analysis it was found that the pit space available for inspecting subway cars of the Interborough Rapid Transit Company will accommodate only 11.48 per cent of the cars, and on the rapid transit division of the Brooklyn-Manhattan Transit Corporation only 9.45 per cent of the cars can be placed over the pits at one time. A comparison of these figures with those for European companies, where a large amount of night inspection still is done, is quite enlightening. There the proportion of cars that can be placed over the pits at one time varies from 23 per cent to more than 100 per cent.

Of course, the reduction in pit space requires careful scheduling and necessitates more shifting of cars or trains off and on. With a properly worked out inspection schedule American roads have found that this does not entail any difficulty, while the character of the work obtainable during the daytime makes the change well worth while.

The Conveyor Platform in Overhaul Shops

CONVEYOR platforms for assembling machinery are associated in the public mind principally with Henry Ford. Visitors to his works have always been greatly impressed with the speed with which the various operations are performed upon motor cars being assembled as they pass different groups of workmen until the completed "flivver" is delivered at the outer end of the conveyor.

As yet the same principle has not been adapted to electric car manufacture or overhaul by any company in this country. Perhaps the nearest approach is the plan followed in the new B.-M.T. shops, known sometimes as the ladder form of layout. Here the trucks to be overhauled are dismantled as they pass down one side of the shop. During this process all parts of the same kind such as armatures, brake rigging, side frames, etc., are taken off every truck at the same place and sent for repairs at right angles to the dismantling track. After the work of repair is finished, the parts are delivered on the opposite side of the shop, where they are put together into a completely overhauled truck and sent out on an assembling track, parallel to the disassembling track but on the other side of the shop.

This principle is also followed in the newly-completed shops of the London Underground Railway at Acton, except that movement in and out of the shop and of the individual parts while being repaired is carried on

This is the issue in July that is devoted essentially to maintenance and construction subjects

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very largely by conveyor platforms, as in the Henry Ford plants.

It is obvious that such a plan has certain definite advantages as well as disadvantages. The advantages relate primarily to the way in which the work can be systematized and speeded up. The disadvantages seem to center principally in possible disturbances to the system if a repair takes a longer or shorter time than the average, and in complications if the equipment is not pretty well standardized. Theoretically, the progressive system is much better adapted to a manufacturing plant with one kind of output like, say, a Ford chassis, than to an overhaul shop for a railway having several types of cars. The reason for this is that to secure rapid assembly all parts should be interchangeable.

The difficulties in adapting the system to overhaul, however, are not as serious as they might appear at first thought. In fact, the system at Acton was installed only after it had been used with great success for a number of years on an equally large scale in the L.G.O. bus overhaul shops, controlled by the same interests. These shops almost adjoin the Acton shops, and the good results obtained in them were responsible for adoption of the plan at Acton. It may be that electric railway equipment in London is not as well standardized as is bus equipment, but some differences can be cared for without a great amount of trouble. The solution, of course, is to group the equipment either before or after it is overhauled, so as to put through at specified periods, parts which are all of one kind.

Incidentally, it may be said, the Berlin surface lines also use the conveyor platform system for motor overhaul. A fact that favors the use of this plan in Europe is that there overhaul is looked upon as a manufacturing job. The word does not mean simply the repair of defective parts. It means entire dismantling and the cleaning and overhaul of all parts. Undoubtedly the better condition of rolling stock abroad is attributable to this thorough system of overhaul.

Improved Cleaning Methods Attracting Wider Attention

ONLY recently has the attention that its importance warrants been directed toward improving the method of car cleaning and using mechanical equipment for this routine maintenance task. For years cleaning has been done almost entirely with costly hand labor. Improvements in car-cleaning equipment have not kept pace with those made in other phases of maintenance. The old method of using a pail of water and a long-handled brush as the sole equipment is still in vogue on too many properties.

Some of the improved car-cleaning methods include water spray pipes, either stationary or with movable fixtures to direct the spray. Some installations use high pressure water supply, others are arranged to force steam or compressed air out with the water. The spraying of a chemical cleaning solution followed by water to rinse has been tried. With all these a considerable amount of hand rubbing and brushing is necessary.

It is evident that cleaning machines will prove particularly useful. The Pittsburgh Railways has done some pioneer work in developing mechanical car washing machines. Rotating brushes do the scrubbing on the sides of the car. Satisfactory machine cleaning for the ends has not been worked out yet. A number of automatic features make it possible for one man to use this machine and clean cars satisfactorily. The Baltimore & Ohio Railroad has installed one of these machines and reports that four men have washed as many as 104 cars in an eight-hour day and over a period of 67 days averaged 52 cars. In this work two men apply a weak solution of oxalic acid to window glass before cars pass to the washer, and two additional men control the sprays and brushes. It is stated that a saving of $600 monthly resulted from use of the machine method of cleaning and cars have a better appearance than previously.

Interior cleaning of cars and their furnishings presents an even greater problem than the exterior. Since vacuum cleaners have come into such general use in homes, they naturally are suggested as one means. Domestic types are of too fragile construction to withstand rough carhouse usage. The heavier stationary commercial types require a special cleaning room and are not favored generally. There is an active demand for a rugged portable type of vacuum cleaner equipped with a 600-volt motor so that shop voltage can be used.

The Field for Tools and Parts Among the Electric Railways

TOOLS and shop equipment have a more important rôle to play in electric railway work than ever before. Cars must be kept in condition at all times and the 8,500 buses now used by the electric railways require an amount of maintenance even greater than do the cars. Both cars and buses cost too much to be permitted to remain out of service for any length of time. This is realized more forcefully than ever before among operating men and shop forces as an axiom.

While the electric railways have come to recognize that there is a need for greater dispatch in correcting defects, it does appear that some manufacturers have not yet sensed the real extent of the field open to them among the electric railways. This seems to be especially true among the makers of automotive shop equipment. Theirs is a gigantic industry which seems to know no limits of expansion, but it does appear that these very makers have not taken full account of the automotive expansion among the electric railways. Adequate maintenance at a minimum cost can be secured only by using modern maintenance facilities. And that presumes, of course, an alignment of tools and facilities to prevent waste in man-hours.

Right here it would seem to be desirable to reiterate that while only a few automotive devices have been designed primarily for use in railway shops, some of the tools in general use in garages are none the less applicable to bus repair although many of the tools designed for automotive maintenance are too light for the heavy-duty requirements of buses. Tools of sturdier construction than some now improvised for duty by the electric railways are needed.

No other place perhaps affords a better opportunity for the favorable consideration and acceptance of equipment of this kind than its display at the coming convention in Cleveland. There it is possible to attract the attention of practically the entire industry. But it is essential that the exhibit be made to do its part. In the past some manufacturers have taken space, but after the show they have, like the Arab, folded their tents and silently stolen away. That, of course, is not the thing

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to do. An exhibit is no less in need of reiteration than is an advertisement. It is one thing to attract attention by doing something spectacular, but to hold attention it is necessary to keep everlastingly at it. So it is with this matter of shop tools and equipment. The manufacturer needs to come in and then come in again and again.

The exhibit along these lines in Cleveland ought this year to be the best ever held. It will be that only if the manufacturers of tools and equipment fully realize the need for reiteration. The manufacturer who properly senses the magnitude of the growing market among the electric railways for a large variety of tools for both car and bus maintenance cannot carry the pitcher of his desire to the well too often.

A Better Era for the Shopman in Cincinnati

IN BUILDING its new Winton shops the Cincinnati Street Railway has assuredly taken a step in the right direction. In equipping them with new tools and machinery throughout, in going just a little farther than the law requires in the installation of safety devices, in providing an abundance of light, and clean, sanitary surroundings for its mechanical forces the company has made an investment that is well worth while. The new shops would be a revelation to many mechanics of a generation ago, who often labored in extreme discomfort amid surroundings that were, to say the least, depressing. Unfortunately such conditions have not disappeared entirely. However, a number of other progressive railways, such as the Toronto Transportation Commission, the Brooklyn-Manhattan Transit Corporation, the Hamilton Street Railway and some others, have revolutionized their shops and created a better era from the shopman's standpoint. This has been done not alone for humanitarian reasons but because the policy has been proved to pay in dollars and cents spent in maintenance work and in the revenue that is obtained from better and more reliable service.

Even after deciding on the construction of the new buildings a quite natural thing would have been to move much of the old equipment from the Chester Park shops, now abandoned. The Cincinnati management, determined to go all the way in its program of modernization, would have none of this, and the result is a credit alike to the company and the city which it serves. Impressive as the expenditure for the new shops may appear, it will be more than justified in the results that are sure to follow. The workingmen employed in the shops will not be slow to respond to the influence of new surroundings and new tools. The result will be better workmanship, lower maintenance costs, a more satisfied train force, fewer breakdowns on the road. This will be reflected in better earnings. Better earnings will ultimately be passed on and translated into better service for the citizens of Cincinnati, where a service-at-cost franchise is operative.

Thus, as the result of this progressive step on the part of the company, there will follow a succession of benefits in which not only the company and its employees but the entire community will share. It is unfortunate, indeed, that more city and interurban properties are either unable, for financial reasons, or indisposed on account of other considerations, to embark upon a similar program. It would do much to raise the industry in the estimation of its own employees and re-establish its prestige in the eyes of the public.

Reorganization of Standards Body Promises Well

EXPERIENCE during the ten years since the American Engineering Standards Committee was established has developed a number of fundamental difficulties inherent in its organization. As a result, there now has been submitted to the member bodies for consideration a revised constitution, differing from the old in two important respects.

The first change is the separation of the functions into: (1) Administrative and financial, which have been placed in the hands of a small board of directors; (2) approval of standards and questions of procedure, which have been placed in the hands of the present "main committee," renamed the "standards council." This separation of functions was deemed desirable to facilitate and expedite the transaction of the several classes of business.

The board of directors, which is a modification of the present executive committee, is to consist of the president, the junior past-president and the vice-president of the standards council, together with nine directors, three appointed each year, one each from three member bodies, nominated and chosen by the standards council and the board of directors. The appointment of a director is entirely in the hands of the member body from which he comes, but it is, of course, essential to the success of the plan that these men be of the executive type, experience and standing. The "standards council" differs from the present "main committee" only in name and in the fact that its duties are restricted to the approval of standards and questions of procedure. As heretofore, the association makes no standards itself, merely passing upon the question as to whether the proper procedure has been followed to warrant granting to a submitted project the designation "American." The individual members are appointed or nominated by the member bodies, which thus remain the basic units of the organization.

The second important change is the adoption of the name "American Standards Association." It was found that the designation "committee" seriously hampered the financial and educational campaigns by its implication that the body was a subordinate organization. The designation "engineering" was objectionable to the architects and certain other groups vitally concerned in the work being done. These difficulties have been eliminated in the new name. Moreover, it gives a balanced, pronounceable combination of initials, A.S.A., which has a decided advantage in practical use.

Revision of the constitution was first suggested by the rules committee of five members. It was referred to and studied for nearly two years by an enlarged committee of nineteen representing every interested group. Finally, it was considered by the main committee. In each instance the change received unanimous approval. The matter will now go before the American Electric Railway Association for approval by the executive committee of the Engineering Association. In view of the increased usefulness which may be expected of the standards body under its new organization, it appears probable that the changes will be accepted and approved.

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Maintaining Roadway

on a Large System

All work of the Public Service maintenance-of-way department is highly systematized and standardized. Materials are stored in large quantities at a central storage yard

By Martin White
Superintendent Maintenance-of-Way
Public Service Co-ordinated Transport, Newark, N. J.

Preliminary work in preparing a roadbed. Paving blocks have been removed and concrete is now being broken

KEEPING the roadway in a first-class operating condition is the part played by the maintenance-of-way department of the Public Service Co-ordinated Transport, Newark, N. J., in the task of providing safe, proper and adequate transportation for the public. The roadway has a total length of 878 single-track miles on city streets, highways and private rights-of-way, used by trolley cars, and 900 miles over highways for the operation of buses. The territory reaches from Mahwah on the north to Bivalve on the south, and comprises some 275 municipalities in the state of New Jersey. On this roadway are more than 350 bridges, ranging from small culverts to huge timber and steel bridges spanning railroads and rivers, and including an elevated structure in Jersey City and a subway into the Public Service Terminal in Newark.

In the past, many types of rail and paving were used on the roadway. There has been developed, out of the experience with the many types, a type of track construction of high standard. The type installed in the streets by the company is based on the idea that the most efficient trackway, with respect to utility, elimination of noise, maintenance of equipment and satisfaction to the car rider, is one laid on a resilient foundation. All of the tracks are laid on crushed-stone ballast on a well compacted subgrade. Chestnut, oak and creosoted ties are placed on this foundation, and are well tamped by hand and machine tie tampers. On these ties are laid 7-in. 101-lb. steel tram rails, with electrically-welded joints. Spikes $5\frac{1}{2}$ in. long by $\frac{9}{16}$ in. square fasten the rails to the ties, while tierods at regular intervals join the rails.

Track on private right-of-way, where no pavement is required, is substantially the same as that laid in streets, differing only in that 5-in. 80-lb. A.S.C.E. T-rail is used in place of 7-in. tram rail.

Special trackwork at crossings, street intersections and connections with other lines has a shorter life than straight track. Maintenance at these locations is important in order that derailments and possible accidents and delay to traffic be prevented. Construction at these points consists of hard center steel and manganese steel, laid on the same foundation as for track. A history of each piece that makes the complete special work layout is kept; the date of purchase, cost, location, date of installation, and dimensions. This detailed knowledge of the exact age of special trackwork aids in getting out of

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it the full measure of useful life. Standardized dimensions for special pieces have been in use for many years and enable the speedy interchange of parts whenever required.

Little Inconvenience Caused by Track Work

Track work is conducted to cause the least inconvenience to car service and regular street traffic. Because of the congestion existing on most streets, only one-half of a street is closed for repair work. Crossovers are installed at each end of the section to be improved and car traffic is routed over one track temporarily. The track gang follows the installation of the crossovers by removing the paving and rail. The electric shovel then removes the old ties and ballast, and excavates to the proper depth.

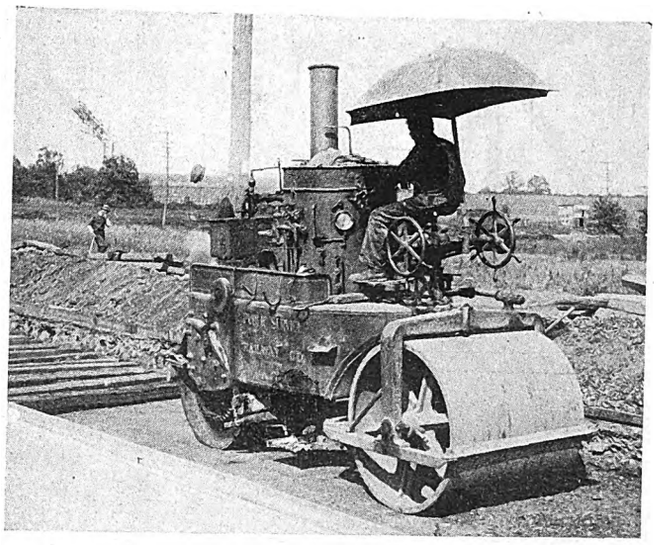
Trucks follow the shovel and load the waste materials which are removed. After the shovel is through the subgrade is thoroughly rolled with a road roller, ballast is installed, ties are laid at standard intervals and rails spiked. Tierods are installed at 7-ft. intervals, joints connecting the rail ends are welded by a special crew maintained for that purpose, the track is lined and surfaced to the proper grade and is then ready for paving.

On sections where the company is required to pave the track, concrete is used as a foundation. The sand, stone and cement are hauled from the main storage yard to the job and piled where the least rehandling of materials will be necessary. After the concrete has been poured and allowed to set, traffic is permitted on the track, the crossovers are removed and a new section of the job is started.

The paving installed by the maintenance-of-way department is a reclipped granite block laid with asphaltic joints. Reclipping the old granite blocks has been practiced by the department since 1904. The clipped blocks are laid on a 1-in. to 1½-in. sand cushion, with close joints, and are well rammed. An asphalt and sand mixture is poured in the interstices between blocks.

Storage Yard Is Accessible for All Shipments

Passaic Wharf storage yard on Lincoln Highway, at the Passaic River, Newark, is the receiving point for shipments of rail, sand, stone, special trackwork, lumber and all other materials. The wharf is easily accessible for freight by railroads, shipments by water, trucks and

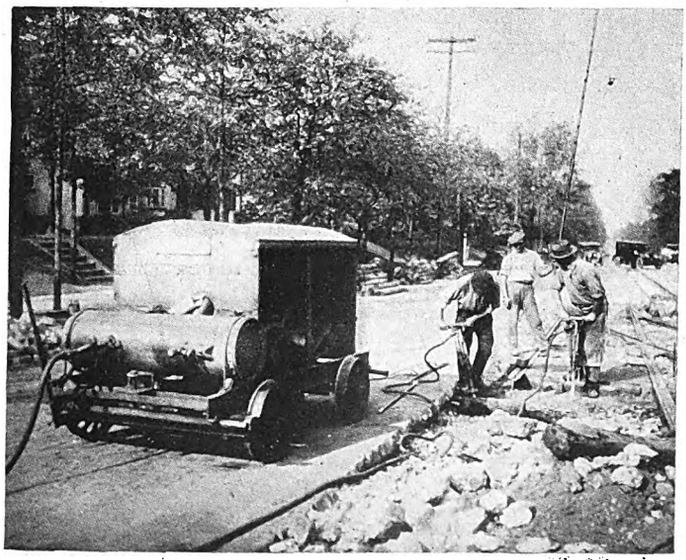


Subgrades are thoroughly compacted with a steam roller

the electric cars of the company. Stationary car and auto cranes unload and store the heavy materials and in turn load them for shipment out of the yard by work cars, derrick cars or auto trucks to central storage yards in the various divisions and to each particular job under construction. Rehandling of materials is eliminated by hauling only such materials as are needed to keep the work moving.

The storekeeper at the storage yard is notified when work is to start, and a bill of materials is sent him for his guidance. Arrangements are made for materials to be sent when required, and the equipment to be used is made ready so that it can be obtained whenever needed. The divisional storage yards are used mainly for storage of materials required in making repairs to the property.

The equipment owned and operated by the department is very complete. Electric shovels mounted on caterpillar trucks, gas and electric concrete mixers, locomotive and truck mounted cranes, air compressors mounted on trucks and miscellaneous tar kettles form the mobile equipment stored at Passaic Wharf and available for service in all divisions. A fleet of dump trucks is also part of the wharf's equipment. Each division has its



Using a compressed air concrete breaker to remove old ties and concrete

Section of a roadway nearing completion. The concrete base has been poured and is ready for the paving

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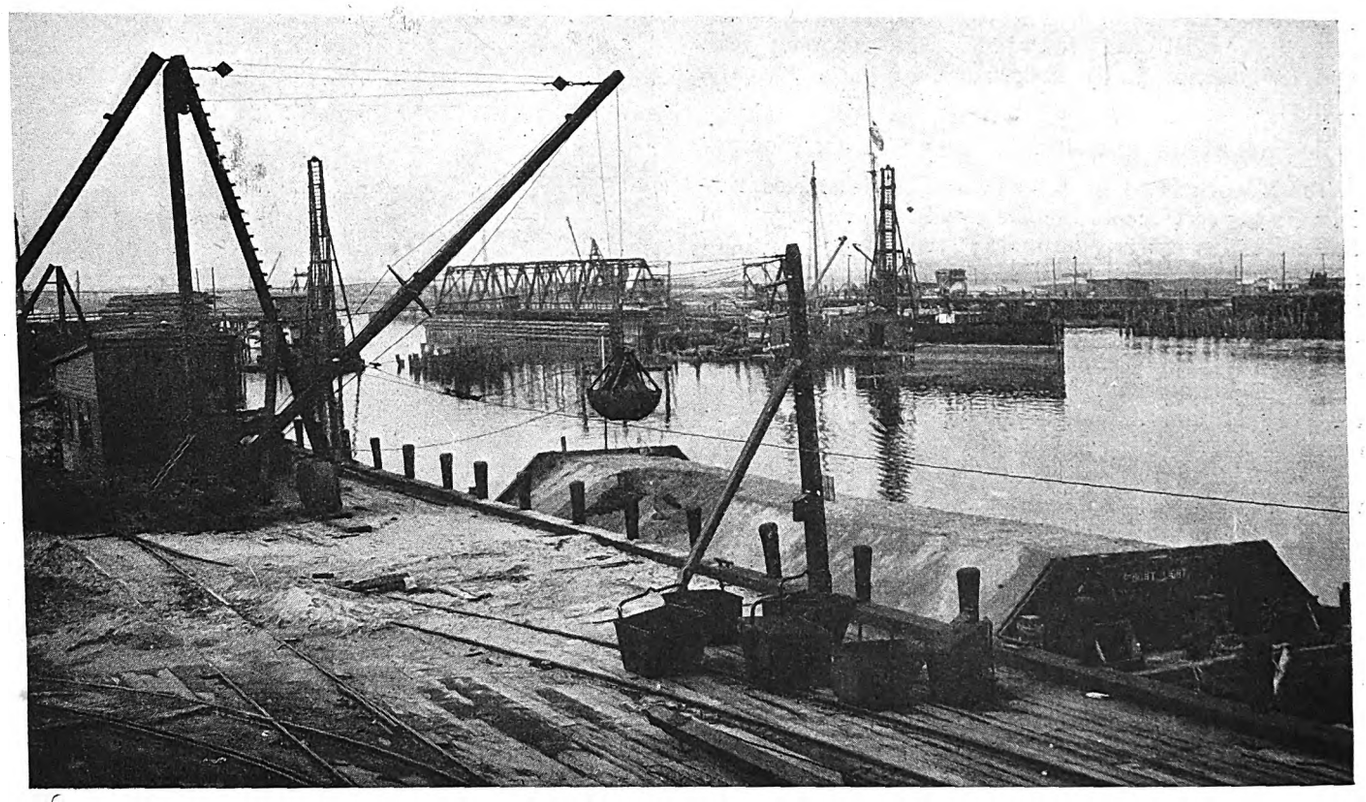


Unloading a sand barge with a stationary crane at the wharf along the Passaic River

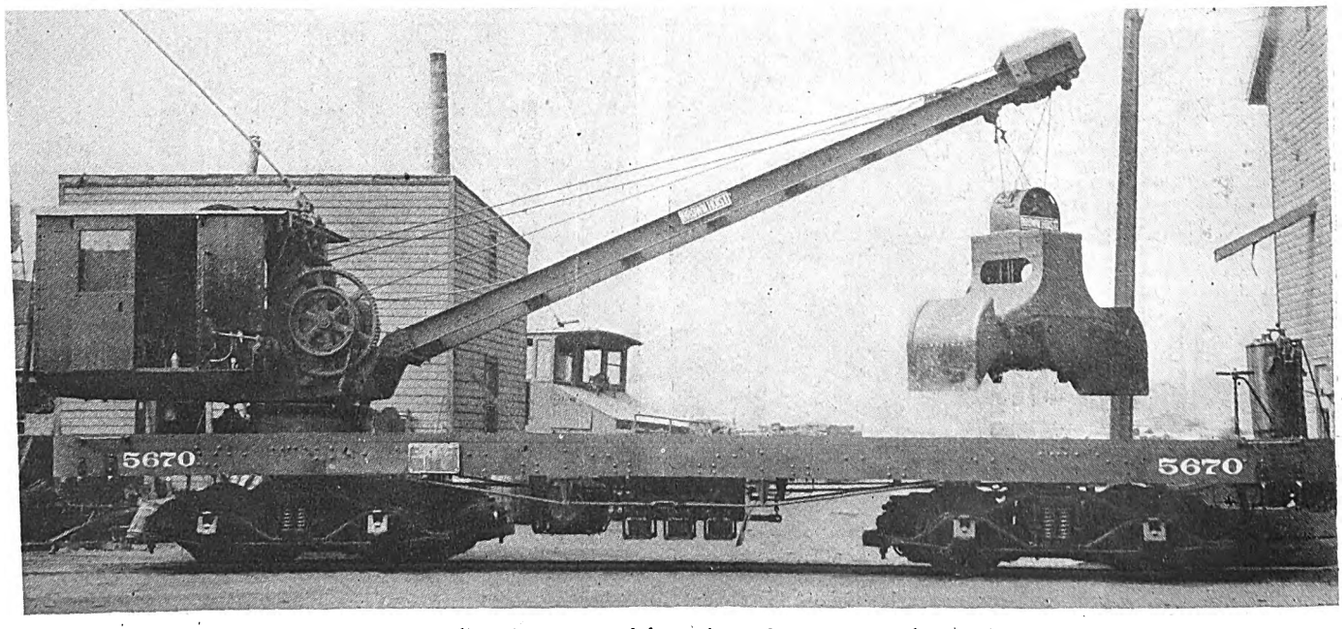
individual equipment, consisting of welding machines, electric track drills, electric grinders, acetylene cutting apparatus and dump trucks.

Welding Is an Important Activity

The welding of track joints and repairs to special trackwork comprise a very important activity performed by the department. Twenty-six welding machines of various types are used, ranging from the light one-man resistance welder to the heavy motor-generator mounted on trucks. Both carbon and metallic arc welds are installed, but metallic arc welds are used most. Fully 3,000 welds are made yearly. Welding has thus far been confined to track work, but it is planned to weld bridges.

Maintenance and upkeep of bridges is under a supervisor of bridges employing a large force of men. An adequate record is kept of the number and type of structures over which the railway runs. The safety and regularity of service depend on careful attention to the maintenance of bridges. Thorough and periodical inspection, followed by necessary repairs, are made during the year. Posts, floor beams and stringers are carefully gone over for flaws, cracks and defects in the steel work. Members are tested for loose rivets. Tiers, abutments and culverts are examined for undermining, bulging, cracking and settling, or other defects that would cause weakness.

Timber bridges are checked to determine whether there



Electric car crane for handling heavy materials at the main storage yard near the Passaic River

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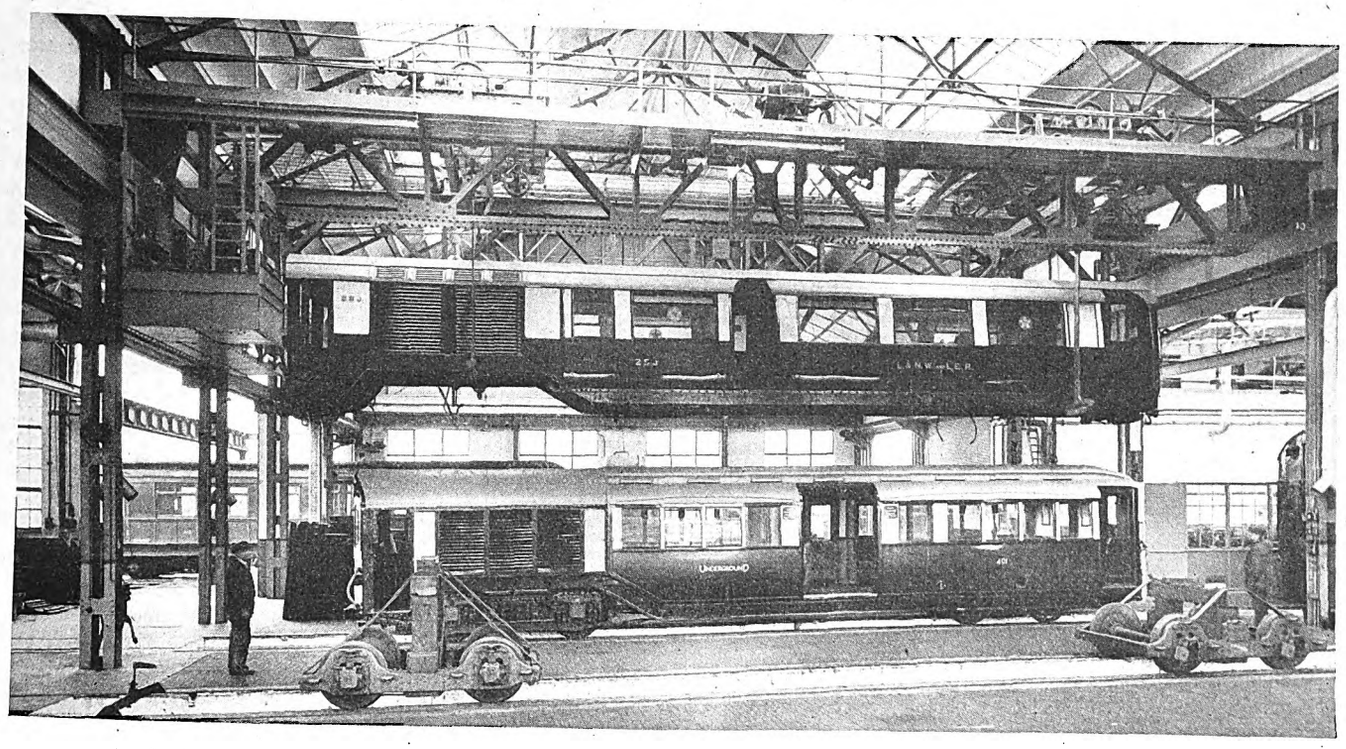
Overhaul by Conveyor Platform

Shops for the overhaul of the rapid transit cars of the London Underground Electric Railways have been completed. A feature is the extended use of conveyor platforms by which overhaul is done progressively as the cars pass through the shops



At the beginning of overhaul. The car body is lifted off its trucks and sent to the body shop on dummy trucks. The service trucks are sent to the equipment overhaul shop

SHOPS of the London Underground Electric Railways at Acton, in the west of London, recently completed, are among the largest in the world. A feature which makes them of even greater interest is the extensive use in them of the conveyor system of car repair. An extended article on the initial plans on this installation was published in ELECTRIC RAILWAY JOURNAL for Aug. 20, 1927. At that time the work of reconstructing these shops for the conveyor system was under way. This method had been used for a number of years in the adjoining shops of the London General Omnibus Company and proved so satisfactory that it was adopted for the electric railway shops at Acton. It is now possible to give views of the completed plant for railway equipment.

The present schedule of these shops calls for the overhaul of 1,406 cars per year, out of a total rolling stock of approximately 2,100 cars. The average service mileage between overhauls is 60,000 for motor cars and 75,000 for trailers. The shops have a capacity for overhaul of 40 cars per week, and at present employ 845 men and 35 women. The area occupied by the main building, accommodating the truck shop, body shop and paint shop, measures 400x375 ft.

In the paint shop and certain other places where disintegration of the unit is not involved, the car body is hauled about on shop trucks, known as "accommodation trucks," by means of electrically-driven endless chains, movement being continuous.

LIFTING SHOPS

The first shop entered by cars to be overhauled is known as the lifting shop. Here the body is raised from the trucks by a 65-ft. span, 30-ton duplex crane of special design, as illustrated. The two grabs are arranged so that they can be used independently or coupled together. When coupled they are controlled from one handle, and the lifting speeds are synchronized regardless of any variations in the load distribution. Here the trucks are run out from under the cars and are taken to the truck shop. Then the body is placed on especially high shop trucks, as shown in the view above. These trucks enable the body to be kept mobile and carried at a height convenient for the men who have to work beneath it.

If only casual repairs are required to the car body, they are undertaken in the lifting shop, as a matter of convenience and to avoid duplication of heavy lifting equipment.

At this stage all seat cushions and upholstery are removed from the car body and pass to the adjacent seat cleaning and repair section. The machine used for cleaning these car seats is illustrated.

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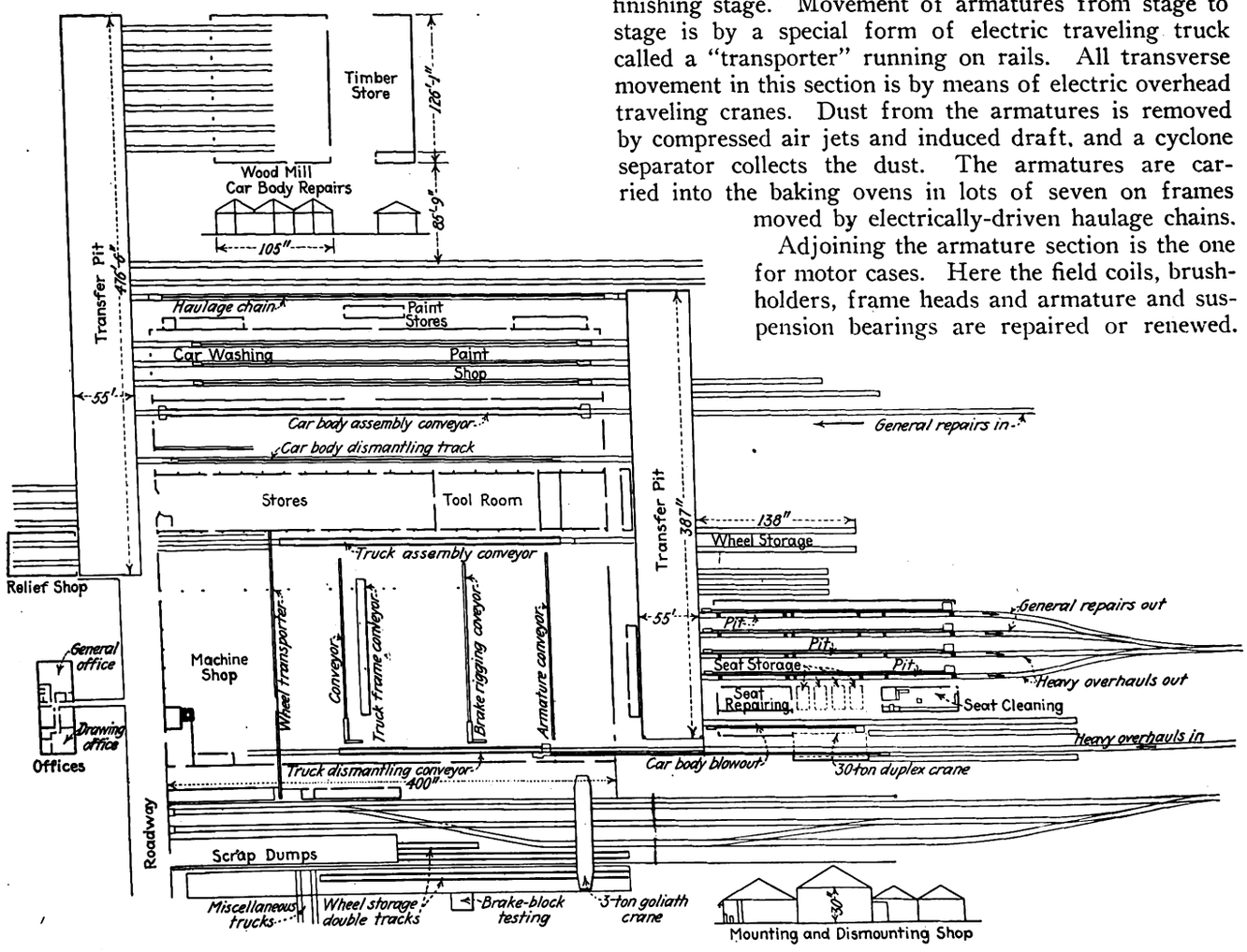
The car body is then drawn by an endless chain into a blowing-out room, where dust and dirt are removed from the electrical equipment and car underframe. This work is accomplished by induced draft connections underneath the car. At the same time compressed air jets are used to break up the dust.

If the car body requires general overhaul or painting, after being blown out, it is sent to the body shop and later to the paint shop, as will be mentioned later. This article will deal with the repair of the truck first.

The truck shop comprises six sections, devoted respectively to the repair of armatures, motor cases, suspension and brake gear, truck frames, journal boxes, wheels and axles.



Simplified plan of Acton shops of London Underground Electric Railways. These shops conduct overhaul by the progressive system

The entire shop is equipped with two electrically-operated conveyors, both on the level of the main floor. One of these is for dismantling and the other for assembling the trucks. They run lengthwise, but in opposite directions and on opposite sides of the shop. Between is a series of smaller conveyors at right angles to them, so that the arrangement is something like that of a ladder lying horizontally.

The general appearance of each of these main conveyors is the same. It can be understood from the interior view of the shop, showing the assembling conveyor. These conveyors travel at the rate of 7 in. per minute.

When a truck enters the overhaul shop on the dismantling conveyor, parts of it are successively removed by electric traveling cranes, until when the end of the shop is reached, nothing is left of the truck but the axles and wheels. These are removed from the conveyor by crane to go to the axle and wheel section, which is the section between the cross rungs of the ladder farthest from the point where the truck entered the shop.

After being lifted from the dismantling conveyor each part travels at right angles to its former direction until, after being repaired, it reaches the assembling conveyor.

The first of the six repair sections mentioned is that where the armatures are reconditioned and, if necessary, are completely rebuilt or rewound. In this department armatures pass from stage to stage along the section beginning with the stripping stage and ending with the finishing stage. Movement of armatures from stage to stage is by a special form of electric traveling truck called a "transporter" running on rails. All transverse movement in this section is by means of electric overhead traveling cranes. Dust from the armatures is removed by compressed air jets and induced draft, and a cyclone separator collects the dust. The armatures are carried into the baking ovens in lots of seven on frames moved by electrically-driven haulage chains.

Adjoining the armature section is the one for motor cases. Here the field coils, brushholders, frame heads and armature and suspension bearings are repaired or renewed. The frame heads and bearings are washed, the motor cases are blown out, bearings are cast, field coils are wound and other work done, all in the order of sequence of operations on the motor case.

In an adjoining section the brake rigging is being repaired. All parts, before being examined for repair, are passed through a washing machine located in this section. Their movement through this machine is automatic because they pass through it on a moving chain grate at a speed of 26 in. per minute. A view of this washing machine appears about at the middle of the illustration showing the truck dismantling conveyor. As the parts emerge from the washing machine, they are inspected and marked with distinguishing colors to indi-

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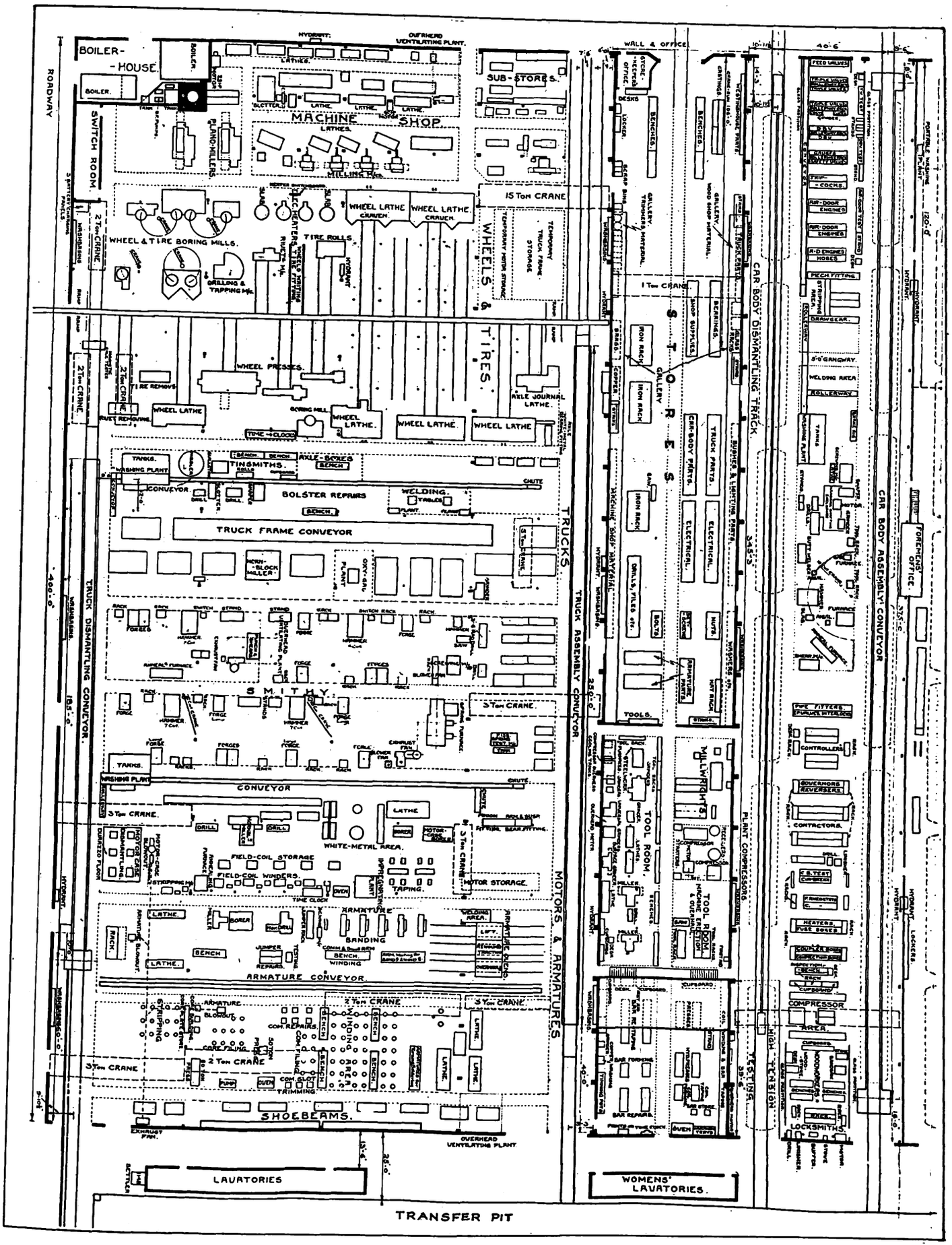

Plan on larger scale of dismantling and assembling truck shop and car body shop. The car body shop is at the right and the truck shop with its two conveyors is at the left

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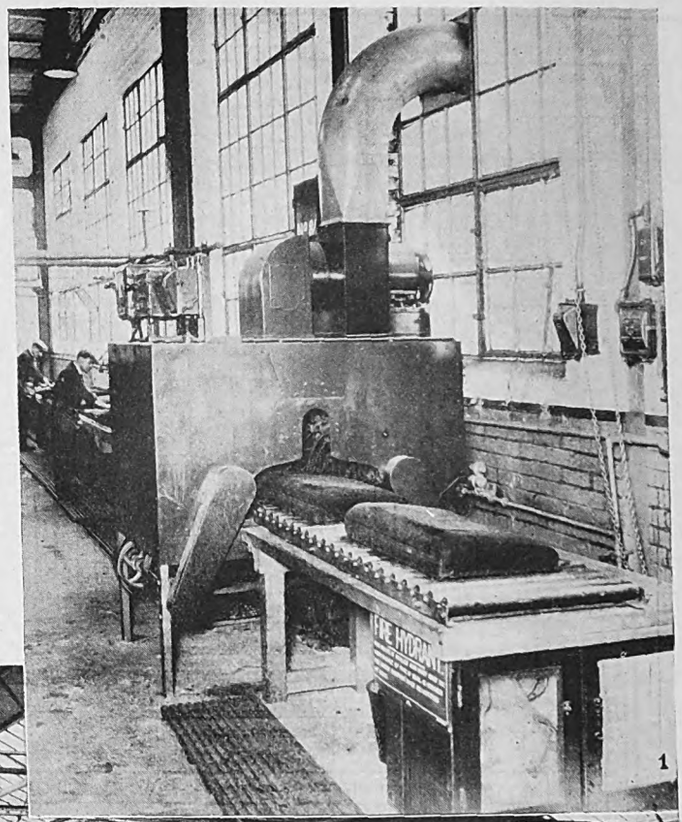
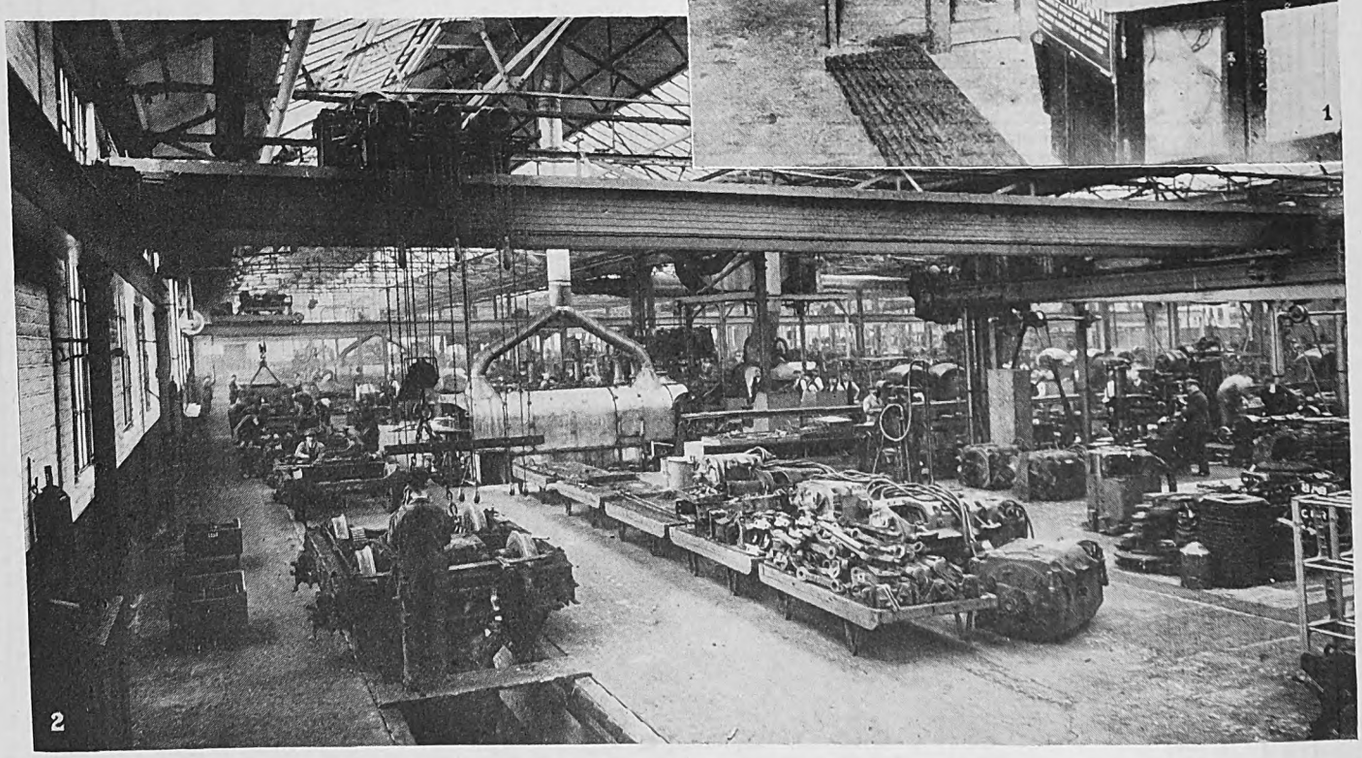
cate the work to be done on them. They are then distributed by means of an electrically-driven conveyor running the length of this section of the shop. This section also has a twin chamber furnace for spring repairs and an annealing furnace.

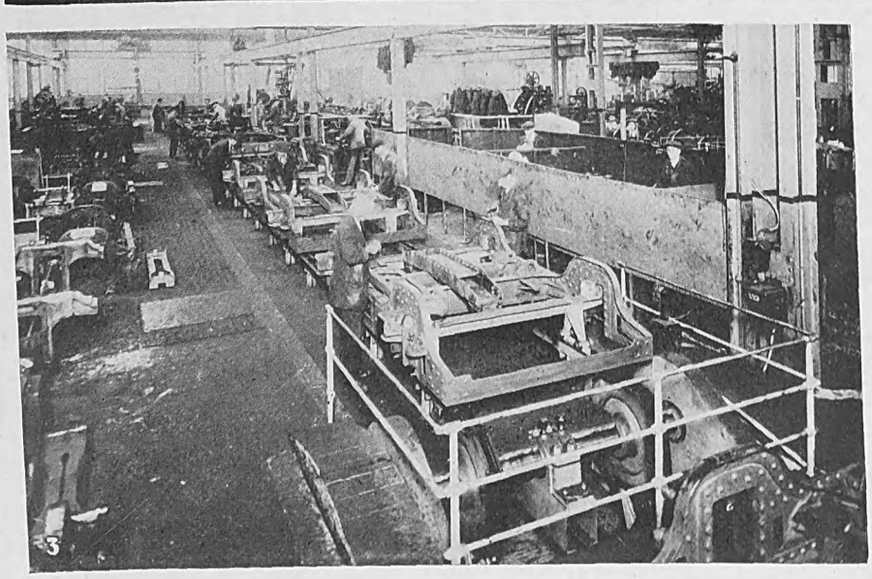
The conveyor in the section devoted to truck frames, also illustrated, moves at a speed of 10 in. per minute. At one side of it is space for dealing with work of an especially heavy character. A 5-ton traveling crane covers the whole area. This section is also equipped with an oxy-gas cutting plant, electric rivet heaters, electric welding plant, etc.

Next is the axle box section, which deals with repairs for car journal boxes, bearings, pedestals, bolsters, etc. Such parts, when removed from the truck dismantling conveyor, are passed first through a washing machine with which this section is equipped. They then travel the length of the section for repairs.

The final section in the truck repair shop is the wheel and axle section, dealing with all repairs to wheels and axles, including wheel turning and the renewal of tires, axles and gears. At the entrance to this section is a







No. 1. Upholstered seats travel through this machine to be cleaned

No. 2. While this truck dismantling conveyor travels at the rate of 7 in. per minute, the trucks are dismantled on it. The motors are lifted off in the first process. What appear to be rails on each side of the pit are really jointed covers of a moving chain. The man standing on the board is moving with the conveyor

No. 3. This is a typical cross-shop conveyor. It is the one used for the truck frames

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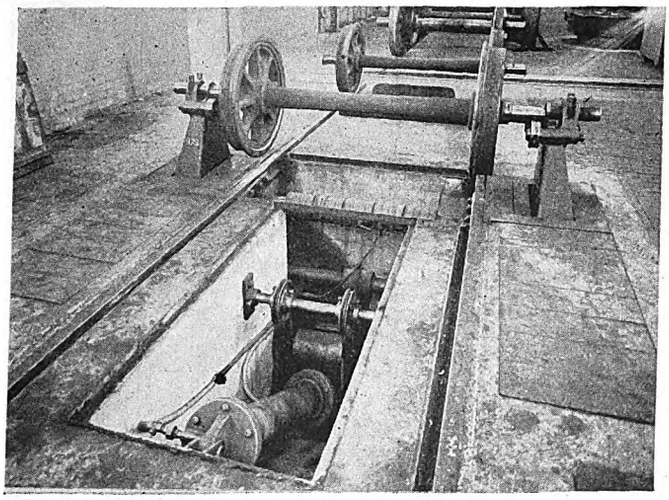
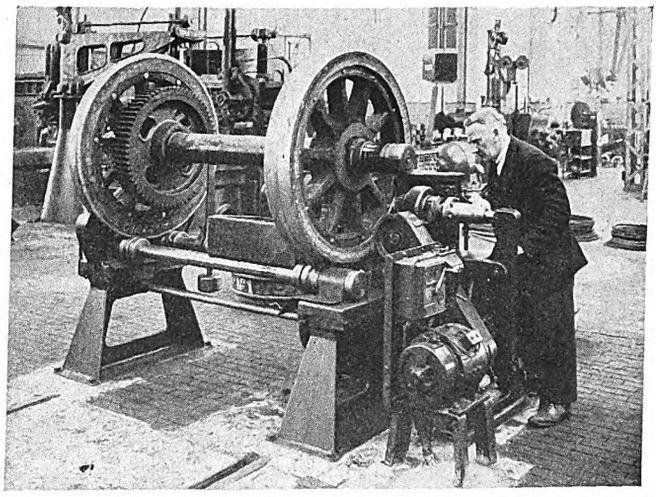


All axles are magnetically tested for cracks on this machine



Pneumatic riveting machine for tires

magnetic device for detecting flaws in the axles, as shown in one of the accompanying illustrations. All axles pass over it when leaving the dismantling conveyor. This magnetic flaw-detecting device is fitted with a compressed air lifting mechanism to raise the wheels off the rail while they are being tested. A pneumatic tire riveting machine used in this section is illustrated.

Progressive Movement in Body Shop Also

The body shop is similar in general arrangement to the truck shop, there being a dismantling row on one side and an assembling row on the other side, with repair sections placed in sequence of operation between these two rows. In the dismantling row, the car bodies are moved along their track by an electrically-driven endless chain, the speed of which is 10 in. per minute. As already explained, the cars travel on accommodation trucks, one of which can be connected to the endless chain by a dog. This dog can be released by a single movement of the lever to stop the car, and it can be connected as quickly.

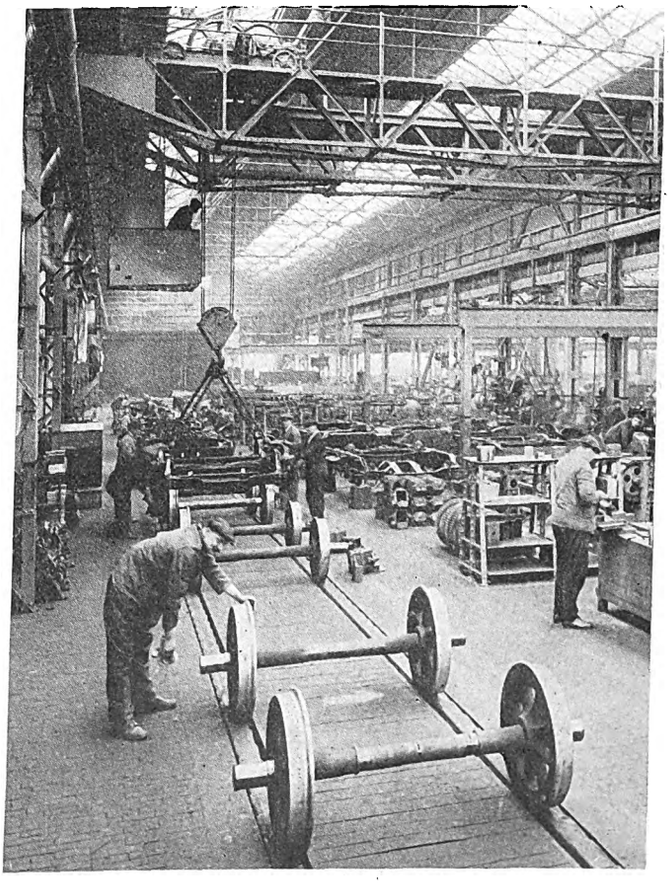
The assembling row in the body shop differs from the dismantling row in the same shop in that it consists of moving track with the floor between the rails moving with it. The rate of travel is 10 in. per minute. The purpose of this kind of a conveyor in the body shop is to keep the wheels of the trucks from revolving. Thus, work can be carried on underneath the car more easily than with the simpler system of chain haul and a fixed floor, used elsewhere in the body shop.

As cars enter the body shop they are subjected to a high-tension test to detect any defects in their electrical circuits. This work is carried out in a railed-off inclosure before the car is attached to the dismantling row chain.

The first cross-section in the body shop is known as the compressor section. Here the compressors are removed from the cars by two overhead electric cranes and are placed on small wheeled platforms running on a framework bench. The work of overhaul is carried on as the platform moves from one end to the other of this bench. In the last position, air and electrical connections are made to give the compressor a running test. The finished compressor is then stored near the assembling conveyor, ready to be placed on the car as it passes along the assembling row. The empty platforms return to the receiving end by gravity on rails underneath the bench.

The next section is devoted to the electrical equipment. This section has storage racks on the dismantling side to receive the various items of equipment as they are taken from the cars, repair benches in the center, and storage bins on the assembling conveyor side to receive the overhauled unit. Each bench has an electric motor mounted on a swiveling pedestal and driving a flexible shaft, to which can be attached various labor-saving tools.

The next section deals with the overhaul of drawbar gear and foundation brake rigging. The parts are first passed through a washing plant similar in design to those used in the truck shop. This section is also equipped



The truck is assembled on this conveyor, beginning with the wheels in the foreground. This conveyor travels at a speed of 7 in. per minute and what looks like rails in the picture are really part of the conveyor

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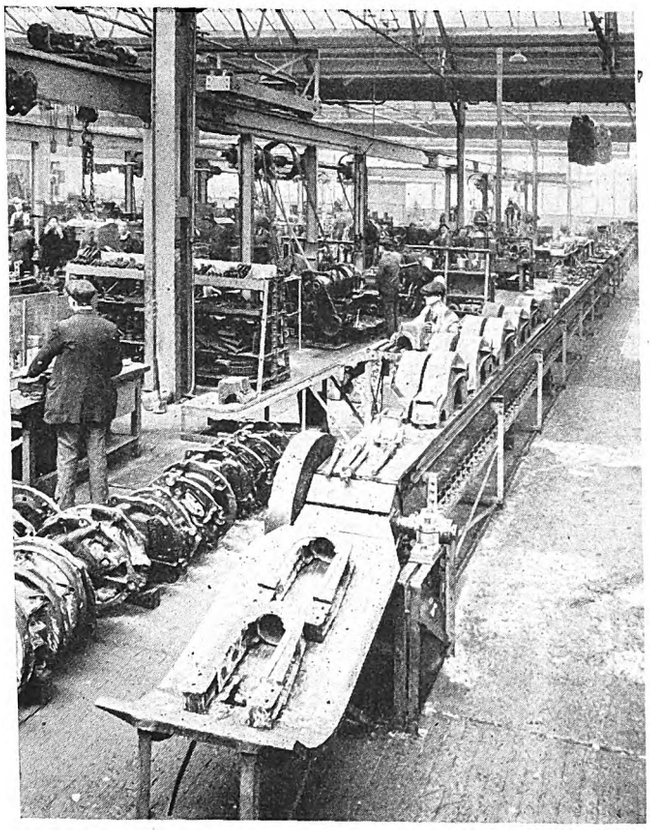
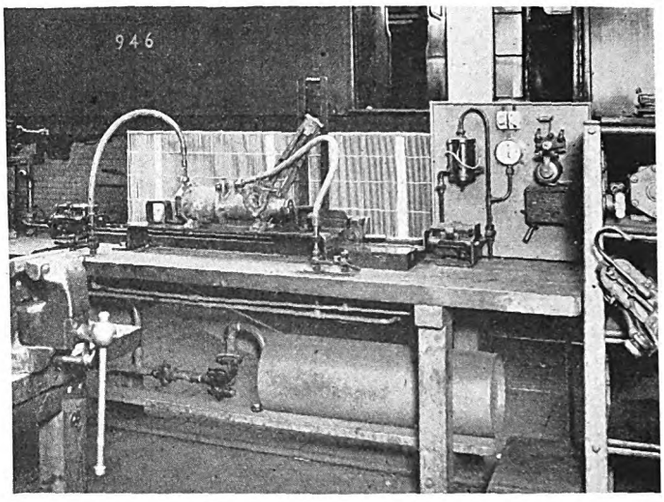


This is another typical cross-shop conveyor. It is known as the material conveyor



Door engines are tested on benches like this

with an electric spot-welding plant, two gas forges, a gas-annealing oven, a 2½-ton pneumatic hammer and the requisite machine tools to render it self-contained.

The next section is devoted to brake valves and air door engines. The parts to be overhauled are passed through a washing plant and are then distributed to the appropriate repair benches by means of a continuously moving conveyor. The smaller parts are carried on this conveyor in containers. The benches are arranged in pairs with a gravity roller-way between each pair. When a container arrives opposite the bench dealing with the items it carries, it is automatically diverted from the conveyor on to the roller-way. After overhaul, the various units are tested on test benches arranged on the assembling conveyor side. A view is shown of the air door-engine testing bench. The containers after being emptied, pass to a gravity roller-way underneath the bench, thus automatically returning to the bottom side of the conveyor, which carries them back to the washing plant.

The paint shop is equipped with three tracks, each with an electrically-driven endless chain just outside one of the rails. This chain moves in a conduit under the floor but connection can be made to it through a slot when cars have to be moved.

Two tracks in the paint shop are devoted to touching up and varnishing. Here the work is done under movement, the car moving forward continuously at a speed of 3 in. per minute. The third track is set apart for re-

The wood shop for body repairs of a heavy nature. Accommodation is provided for seven cars

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painting. Here the movement is intermittent, the cars being moved at fixed intervals by means of a chain which runs at 30 ft. per minute.

Obviously, not all work can be done with the cars under movement. This is recognized in the wood shop, a view of which is published. This shop deals with repairs to car bodies, which are of a heavy nature. It is fully equipped with wood-working machinery and supplies unit parts to the other shops. Accommodation is provided in this shop for seven cars. Approximately 4 per cent of the total number of cars passing through the works enter this shop.

Hot air heating is used throughout in all the shops. There are five heaters which are adjusted to maintain steam to provide an even temperature of about 55 deg. F. in all parts except in the paint shop, where a temperature of about 65 deg. F. is maintained.

Heaters Require Maintenance, Too

By George E. Oakley
Consolidated Car Heating Company, Albany, N. Y.

ELECTRIC heaters require little maintenance, and undoubtedly receive less attention on inspection and overhauling of the cars than they should. This lack of attention in connection with their maintenance is probably due to the small amount of trouble experienced with this part of the car equipment. However, there are reports of cold cars, over-heated seats, and occasionally of short circuits.

The best time to begin heater maintenance is when the heaters are installed in the cars, because a good job done then will save a lot of trouble later. In making connections to the heater terminals, care should be taken that the connections are good and tight and that there are no loose strands of wire. If soldered joints are to be made or terminals soldered on wires, they should be clean and well-made, because a large proportion of the troubles in electric circuits start at the connections or joints in the circuit.

After the heater wiring has been completed, but with the heater ground wires disconnected, the heater circuits should be given a high potential breakdown test of from 2,000 to 3,000 volts a.c. in order to detect any weak spot in the wiring which might develop into a ground. Where there are two or more heater circuits, the same breakdown test should be tried between the different circuits in order to detect short circuits. The heaters should now be tried out to see that they all are working. It is a good plan to connect an ammeter in the circuit to see that the heaters are taking the proper current.

At the regular car inspection periods the heater equipment should be inspected as follows: (1) Examine fuse boxes to see that they have the proper capacity fuses, and that the fuse dips are in good condition. (2) Examine the switches to see that contacts, clips and switch handles are all right. (3) If cars are equipped with thermostatic control, examine the magnetic switch to see that it is operating properly and that the contacts are in good condition, and inspect the thermostat to see that it has not been damaged or tampered with. (4) Try out the heaters to see that all circuits and all heaters are working. This can be done by leaving the heat on for a while and then feeling each heater by hand to see that they are all giving off about the same amount of heat.

Whenever it is necessary to replace a heater or a heater coil, care should be taken to see that the proper coils are used and that the heater is reconnected properly in the circuit. As a check on this, it would be well to take voltmeter readings across the new coil or coils after being connected in the circuit. The voltage drop across each coil should be equal to the line voltage divided by the number of coils in the circuit. If the drop across the new coils is more than 5 per cent higher or lower than this normal value something is wrong. This heater should be removed, the coils checked carefully and their cold resistance measured with a bridge. If the heater coil is the wrong one for that particular equipment, it should, of course, be replaced with the correct coil. However, if the coil resistances measure up all right the wire size is correct. The trouble lies in the other heaters in the circuit or else in the wiring or connections. The heater should be put back in the car and connected in circuit, and voltmeter readings then taken across all coils in the circuit. If the voltmeter reading across the coil in question is low, it indicates that the voltage drop across some of the other coils is higher than normal. This may be due to too high a resistance of the coils or to poor connections. If the voltmeter reading across the coil in question is higher than normal, it may be caused by one of the following: (1) Some, or all of the other coils may be too low in resistance. (2) One or more coils may be wholly or partially short circuited. (3) There may be a ground on the heater circuit between the heater in question and the last heater in the circuit.

In making these tests, the voltmeter readings should not be taken until the power has been on long enough to attain a constant value. This is of particular importance with heater coils of iron wire. The temperature coefficient of iron is high and consequently the cold resistance is low. As a result the current is high when the heat is first turned on. As the coil heats up the current gradually decreases and becomes constant when the temperature of the coil becomes constant. Voltmeter readings, if taken too soon are thus liable to be misleading.

If the heater equipment has been maintained properly, about all that must be done in the fall is to blow out the heater cases with compressed air, or vacuum, to remove the dust and dirt which naturally collect. When the cars are overhauled the heater equipment should be put in first-class condition, including heaters, fuse boxes, hand-operated switches, magnetic switches and thermostats.

It is not necessary to remove the heaters, unless they are defective, but it would be well to inspect the terminals and connections and test out the wiring for grounds or short circuits. Ammeter and voltmeter readings of the current and drop across each heater coil should be taken. These tests will show up any defect in the coils or wiring.

For the purpose of ordering repair parts for heaters, and particularly coils, the following data should be on file: (1) Class of car, (2) type and catalogue number of heater as cross-seat, panel, trussplank, vestibule; (3) number of heaters per car, (4) number of coils per heater, (5) number of coils in series across line voltage, (6) cold resistance of heater coil and (7) size of heater coil wire.

In ordering parts other than coils it is sufficient to give information listed under item 2 in addition to a description of the parts wanted. When ordering coils the information under items 2, 3, 5, 6 and 7 should be given. The information listed under items 6 and 7 should be obtained direct from the heater manufacturer, and not by measuring coils in heaters or in stock.

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Bearing Practice and Babbitting Facilities*

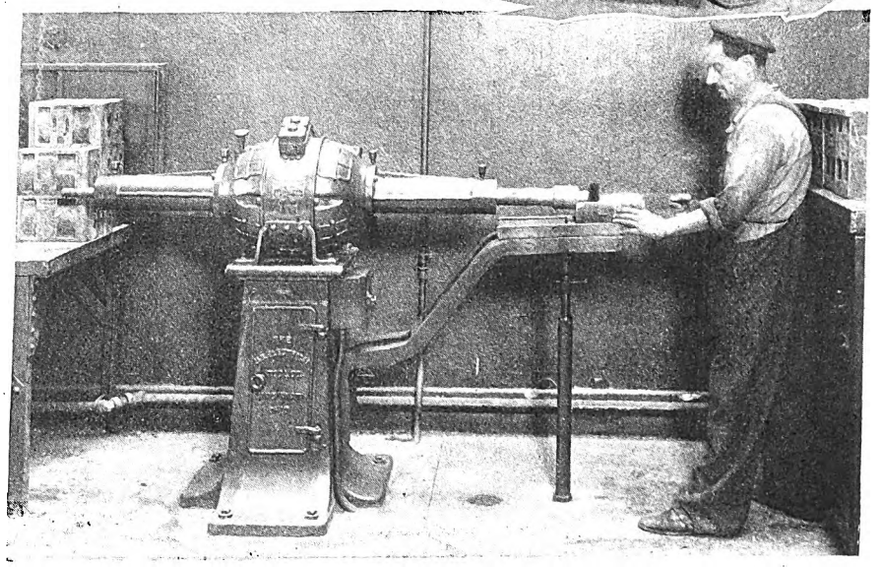
In New B.-M.T. Shops

By Clarence W. Squier
Associate Editor ELECTRIC RAILWAY JOURNAL

PRACTICE on many electric railways is to determine the period between general overhauling of rolling stock by the length of time that bearings can go without renewal or repairs. At one time they were a limiting factor in fixing the overhauling period on the Brooklyn-Manhattan Transit Lines. By use of bronze bearings with a thin lining of babbitt, by fitting each bearing to its axle or shaft, and by use of perfected methods and equipment in the bearing department, overhauling periods have been lengthened until now bearings are no longer a factor. The two-year period between overhaulings of the railway's subway cars is considered as the maximum time that the car bodies should go between paintings in order that they may not present an unattractive appearance, and all equipment is overhauled at that time and put in condition to stay out for another two-year interval.

In arranging and equipping the babbitting department at the new Coney Island shops advantage was taken of the experience gained with the very complete equipment previously located in the railway's East New York elevated repair shop. Before repairs are started bearings are cleaned in chemical cleaning tanks. Excess babbitt is removed by motor-driven wire brushes and mandrels are pressed out with a forcing press. The babbitt pots and drying and preheating furnaces are equipped with Bristol recording pyrometers. All furnaces were supplied by the Mahr Manufacturing Company, Minneapolis, Minn.

Riveting check plate in place



Polishing the inside of a journal bearing with a motor driven wire brush

All bearings are gaged carefully on the outside for wear

The babbitting department in the Coney Island shops occupies a floor space of 40x40 ft. Bearings to be repaired are delivered through a doorway in the south side of the room by electric trucks. They are placed in wire baskets and then are handled by a jib crane into cleaning tanks. There are three of these tanks in the department, each 3x3x2 ft. Two have a chemical cleaning solution and the other has water for rinsing. Bearings remain in the cleaning solution for about 1½ hours. After rinsing any grease, scale or dirt that still may remain on the bearings is removed with a wire brush. They then go into an oil-fired drying furnace which is kept at a temperature of about 600 deg. F. Careful cleaning of the bearing shells is considered very important, as effective tinning and babbitting can not be done on dirty material.

From the drying furnace bearings are routed in two

**This is the fifth article on methods and equipment used in the Coney Island shops of the B.-M. T. Corporation. Others were "Truck Overhauling," published April 21, 1928; "Intermediate Truck Repairs," published May 5, 1928; "Wheel, Gear and Axle Maintenance," published May 19, 1928, and "Motor Overhauling," published June 16, 1928.*

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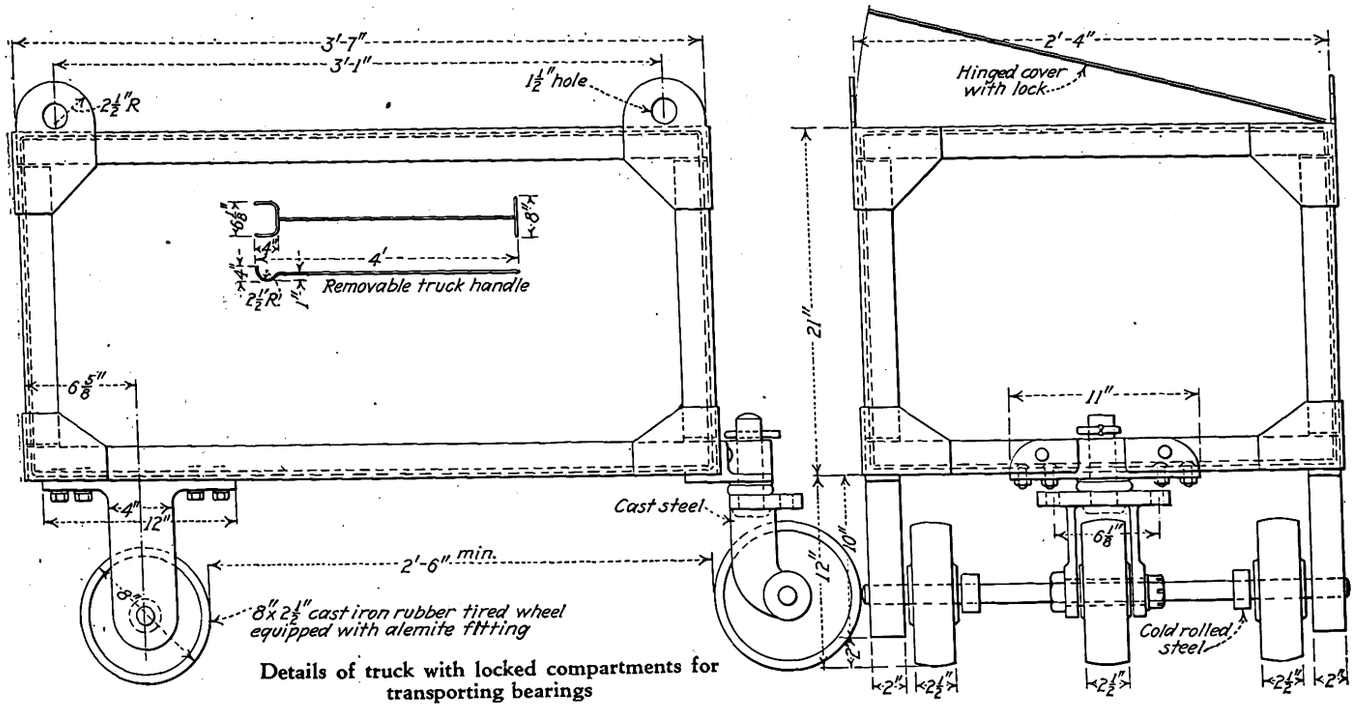

Details of truck with locked compartments for transporting bearings

directions. Journal bearings go to a single-pot babbitt furnace on the east side of the room for burning out the old babbitt, while armature and axle bearings go to a similar furnace on the west side of the room for burning out. Babbitt removed from bearings is skimmed of all dross and refuse and then is run into molds so as to place it in convenient form for further use.

From the melting-out pot, journal bearings go to the tinning furnace which has pots containing half-and-half solder. The inside section is swabbed with a flux and a coat of whiting is painted on the outside to keep the tin from sticking where it is not desired. The bearings are then dipped in the solder until they are coated thoroughly. They are left in the pot until they are so hot that the solder will run off readily.

After tinning, bearings are placed in a preheating furnace to keep them hot, ready for babbitting. This furnace is kept at a temperature of from 500 to 600 deg. F. After the babbitting jigs and mandrels are once heated they remain hot from the hot babbitt. Preheating of the jigs and bearings is important, otherwise the babbitt is sluggish in pouring due to the composition of copper and antimony. It is the practice in the Coney Island shops to take bearings from the preheating furnace and dip them in the babbitt pots which are kept at a temperature of 800 deg. F. The bearings are thus at a temperature nearly the same as the babbitt when it is applied.

The babbitt linings are poured with the bearings in a vertical position. Mandrels are made with an allowance of ⅛ in. for boring of the rebabbitted bearing. The thickness of babbitt remaining after machining is about ⅛ in. in armature bearings and 3/32 in. in axle bearings, so a total thickness of about ¼ in. is cast on. Mandrels are dipped in an emulsion of fire clay about every fourth pouring. This prevents sticking of the babbitt to the mandrel as well as blowholes, and gives a very smooth inside finish.

ARM MOTOR	BGS END	MAT.	T-M-B NOS.		
WEST 50.B	C.E	BZ	1	14	27
	P.E	BZ	2	15	28
WEST 50.E	C.E	BZ	1	14	27
	P.E	BZ	3	16	53
WEST 50.L	C.E	BZ	1	14	27
	P.E	BZ	3	16	53
WEST 300	C.E	BZ	9	22	37
	P.E	BZ	10	23	38
WALKER 15	C.E	BZ	12	25	41
	P.E	BZ	8	21	42
G.E 212 248	C.E	BZ	1	14	60
	P.E	BZ	2	15	61

As shown at the left, all mandrels and jigs are stored carefully on shelves provided with numbers so that they can be located quickly. A board on the wall adjacent shows the workman the particular mandrel and jig needed for the babbitting operation

The view below illustrates the removal of babbitt from the windows of armature bearings by means of hot irons

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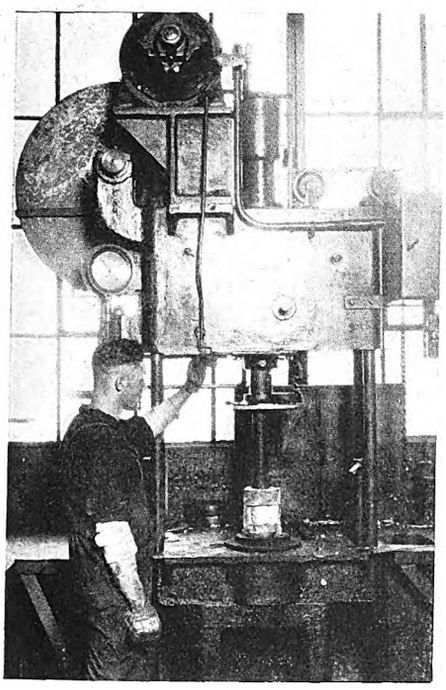
The metal used is of a composition commonly known as genuine babbitt. It consists of 83⅓ per cent tin, 8⅓ per cent antimony, and 8⅓ per cent copper. Ladles used are of a self-skimming type with a bridge extending over the front portion and a screen inside extending down from the lip so that the molten metal is taken from near the bottom. The babbitt is mixed thoroughly by agitating the molten metal just previous to filling the ladle. In pouring, the metal is run from the ladle in a steady stream directly down along the mandrel. This avoids splashing and pocketing of air. If the metal is splashed against the mandrel, it will cause blowholes and result in a mushy bearing.

After bearings are babbitted they go to the trimming table where all fins, burrs and excess metals are removed with a hot iron. Chipping of bearings is avoided as it may loosen the babbitt lining. A small oil furnace is used for keeping trimming irons hot. The next operation for journal bearings is that of filing off all lumps and burrs from the bronze shell, using a special soft metal file. The check plates are fastened on with a pneumatic riveter and then they go to a machine where the inside is polished with a motor-driven wire brush. This machine was furnished by the United States Electric Tool Company and is direct driven by a Westinghouse 3-hp., 600-volt motor. Each bearing is fitted to the particular axle or shaft for which it is intended, so the final boring out is done in the truck and motor repair sections of the shop. Armature and axle bearings are bored 0.003 in. to 0.004 in. per inch of diameter larger than the axle or shaft that they fit.

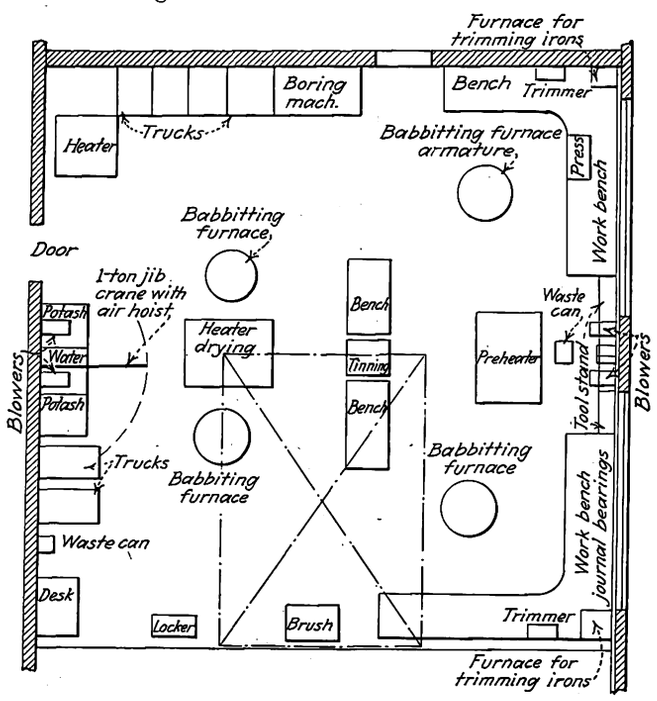


Mandrels are pressed out of armature bearings by a hydraulic press

Armature and axle bearings follow the same procedure in the babbitting room as journal bearings for the cleaning, drying and melting out of the old babbitt. They then are tested carefully with snap gages for wear on the outside of the shells. A maximum of 0.017 in. wear is allowed. These snap gages are kept in a box at the bench. When bearings are received, they are gaged and any over which the snap gages will pass are put aside for scrapping. Tinning and preheating methods are the same for all types of bearings. Axle bearing linings are poured, one half at a time, in the babbitting jig.

A carefully worked-out system for keeping track of babbitting jigs and mandrels is used in the department. Each part is numbered and is placed in a definite location on storage shelves. A large board occupies one side of the room. On this is a tabulation in large figures showing the various mandrels, bases and bands which should be used for each particular type of bearing. An accompanying illustration shows this board. The columns give type of motor; particular type of bearing which is to be babbitted, such as commutator end or pinion end; material which is used for the bearing shell; numbers of the various broaches used; numbers of mandrels, and numbers of bases. Thus, if a commutator end bearing for a GE-248 motor is to be babbitted, the workman uses mandrel No. 14 and base No. 60. This method reduces the number of the various parts and makes it easy for the workman to select the proper fit.

Smoke charts are used on the pyrometers. They are taken off at the end of each working day, 4:30 p.m., and then are dipped in a thin shellac varnish to make the record permanent. New charts are put on the pyrometers each morning at 7 o'clock. When removed the chart is given a record number and is dated, signed with the initials of the foreman and the number of the furnace.



Layout of equipment in babbitting room

Bearings are poured with babbitting metal at a temperature of from 800 to 850 deg. Whenever new babbitt is added to the pot, the temperature drops, but is quickly brought up to the required temperature, which is a minimum of 800 deg.

Armature and axle bearings are poured in a vertical position with the collar end down. The end flanges of armature bearings are babbitted. After pouring a bearing, the burrs at the edges of the mold and the bearing windows are removed by hot irons, the same as for axle bearings. A 30-ton Watson-Stillman hydraulic forcing press in the center of the babbitting bench is used for the removal of mandrels after the babbitt has cooled.

Care is exercised in the handling and transportation of bearings from the babbitting room to the departments where they are fitted to axles or shafts. Sheet steel trucks have receptacles 2 ft. 4 in. by 3 ft. 7 in. by 21 in. deep into which the bearings are placed carefully. The cover is locked when it leaves the babbitting room and the foreman of the department to which the bearings go is the only person who has a key. The bearing trucks have three 8-in. diameter wheels and are towed by electric tractors.

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ARTHUR E. CLEGG Is Awarded June Maintenance Prize

Attachment for milling out commutator-neck slots so as to clean out the leads and solder, submitted by Arthur E. Clegg, of the San Diego Electric Railway, is awarded the $25 monthly prize for June. Honorable mention is given to O. R. McClain of the Gary Railways, for compressed air vacuum cleaner

IN ORDER to speed the work of armature repairs, hand work should be replaced by machine work wherever possible. Cleaning out of old wires and solder from the commutator neck slots of armatures is tiresome and costly when done by hand. To eliminate the hand work Arthur E. Clegg, foreman of the electrical department of the San Diego Electric Railway, San Diego, Cal., designed and made a milling cutter for attachment to a commutator bar slotting machine. With this the slots are cleaned quickly and as they are left perfectly clean the work of soldering in new leads is facilitated. A description of this device for cleaning commutator neck slots was awarded the $25 monthly prize for June in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest.

Honorable mention is given to O. R. McClain, foreman of the air brake department Gary Railways, Gary, Ind., for his description of a compressed air vacuum cleaning equipment used in the shops of that railway. Interior cleaning of cars is another problem that is receiving much attention by electric railway maintenance forces. From the success with which vacuum cleaning equipment is used in the average household, it appears that such equipment is needed for the interior cleaning of cars. However, experience has shown that the household equipment is not sturdy enough to withstand the heavy usage required in railway shops. As a large number of cars must be cleaned daily, light portable equipment is particularly desirable and this must be of a construction that will withstand heavy-duty service and almost continual operation.

SHORT TIME LEFT FOR CONTEST

There still remains but a little over a week for sending in maintenance items for competition in ELECTIC RAILWAY JOURNAL'S prize contest. Any material mailed so as to bear a postmark up to midnight, July 31, will be entered. Those having material which they wish to send in are urged to submit it at once.

There has been quite general comment from the heads of maintenance departments and general managers of electric railways as to the great benefits which have resulted from the submission of these improved ideas in the contest. It has stimulated the men who are doing the work to give more attention to their problems, and to devise means for doing away with many of the tedious operations, in this way speeding up the work. Although this contest ends July 31, ELECTRIC RAILWAY JOURNAL will continue to accept maintenance items of this character for publication in its columns, and will pay $5 for each item that is accepted for publication. Maintenance men should bear this in mind when introducing any new improvements or new equipment. By passing on their experience to other electric railway men, the industry itself will be benefited materially and other maintenance men helped to perfect better maintenance methods.

Arthur E. Clegg

who was awarded the monthly prize for June in ELECTRIC RAILWAY JOURNAL'S maintenance contest, has had a wide experience in electrical and railway work, both with manufacturing and operating companies. While getting an education in the Antigo High School at Antigo, Wis., from which he graduated in 1912, he worked after school hours for the Antigo Electric Company on various electrical jobs. For several years after graduation he had charge of the meter department. He also worked for one year with the Cutler-Hammer Manufacturing Company, at Milwaukee, Wis., in the testing department, testing Navy and industrial control.

He broadened his experience and knowledge by seven years' service with the Westinghouse Electric & Manufacturing Company at East Pittsburgh, Pa. Here he attended the Westinghouse Technical Night School and worked in the testing department, and later in the engineering department as engineer on direct-current railway motors and control.

His railway operating experience began on the Indiana Service Corporation, Fort Wayne, Ind., where for two years he was engineer of equipment in the mechanical department. Here he was in direct charge of rolling stock electrical equipment, including maintenance, rebuilding of control apparatus, rewiring cars, new installations of equipment, and general electrical shop work. At present, and for the past 3½ years, he has been foreman of the electrical department of the San Diego Electric Railway, San Diego, Cal., in charge of maintenance of control and motors, and maintenance of ignition of buses. Mr. Clegg has originated a large number of improved methods for electric railway and bus maintenance work which save time and reduce costs.

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Electric Railway Journal Maintenance Data Sheet

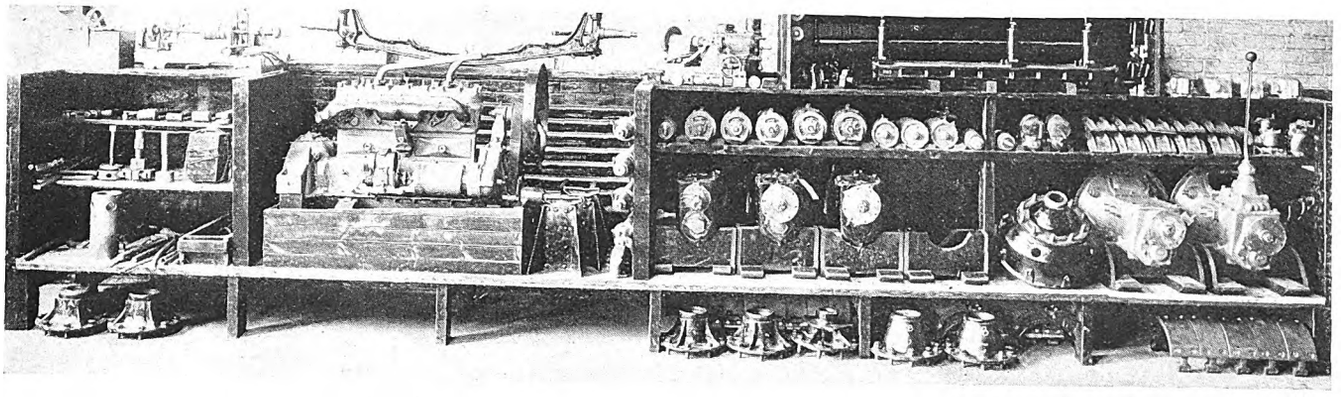
BUSES AND TRUCKS—16

Stand for Special Tools and Replacement Parts of Buses*

By John H. Walsh
Superintendent Rolling Stock and Shops Middlesex & Boston Street Railway, Waltham, Mass.

IN ESTABLISHING a system of unit overhaul at the Waltham repair shops of the Middlesex & Boston Street Railway for its fleet of 85 buses it was felt that centralization of replacement units would increase the efficiency of the shop and also serve to keep it neater. A stand was built for special tools and spare parts.

The differential and transmission units, which are heavy and awkward to handle, are placed in wooden cradles built for the purpose. When one of these replacement units is needed for service, it is rolled, with the aid of a small piece of pipe, upon a portable truck which is the same height from the floor as the heavy differential and transmission units. The spare motor is moved with the aid of an overhead crane. The total value of the replacement units and special tools in this stand is $5,824.



Stand arranged for special tools and replacement units of buses

* *Submitted in* Electric Railway Journal *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

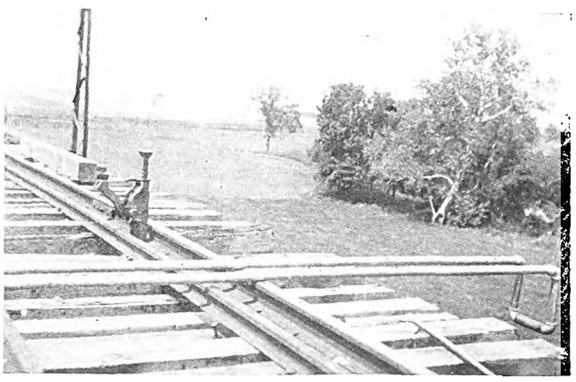
TRACK AND WAY DEPARTMENT—30

Handling Bridge Ties During Replacement*

By G. C. Bridges
Assistant Superintendent Texas Electric Railway, McKinney, Texas

WHEN replacing bridge ties, some sort of a support is necessary in order to do the work economically and quickly. The accompanying illustration shows a device which has been used for several years by the Texas Electric Railway. It is made of 1¼-in. pipe with ells and nipples to give the desired shape. It is used in the replacement of bridge ties 8x8 in. by either 9, 10 or 12 ft. long.

Two longitudinal pipes extend over the top of the rail. At the end a loop is formed to go underneath the tie. The bottom nipple has a piece of 2-in. pipe put on to act as a roller. This permits removal of an old tie and replacement with a new one without lifting. Jacks are used to raise the rail. In order to permit them to fit between the ties, the feet of the jacks are sheared to a width of 5 in. Hooks at one end of the pipe catch over the opposite rail.



Pipe framework in position for replacing ties in bridge 55 ft. above ground

* *Submitted in* Electric Railway Journal *Prize Contest.*

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Electric Railway Journal Maintenance Data Sheet

BUSES AND TRUCKS—17

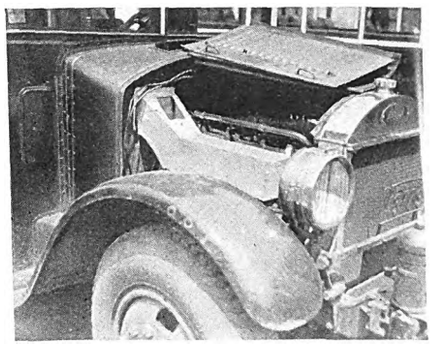
Exhaust Manifold Heater for Buses*

By C. B. Hall

Chief Clerk Mechanical Department Virginia Electric & Power Company, Norfolk, Va.

HEATERS of various kinds supplied as standard equipment by bus manufacturers are of a type which conduct exhaust gases through the heater pipes running into the interior of the bus. Flexibility of the piping from the exhaust pipe connection to the heater pipes causes corrosion and breakage under vibration and permits noxious gasses to collect beneath the floor boards. After a study the mechanical department of the Virginia Electric & Power Company, Norfolk, Va., decided to adopt another arrangement for heating with hot air.

A sheet steel hood was used from the front of the manifold to the back which enters directly into the dash.



Exhaust manifold heater installed on Mack bus of the Virginia Electric & Power Company

The front hood being open adjacent to the fan, air is blown directly through into the bus from a point where it is gathered. As the manifold is the hottest part of the exhaust system the air forced over it provides sufficient heat for cold weather in the climate of Norfolk.

To use the heater the trap door in the dash is opened and the vent in the top of the heater hood closed. The trap door swings upward from a top-pivoted joint. When the dash opening is closed the vent in the hood provides circulation through it which prevents overheating of the manifold.

* *Submitted in* Electric Railway Journal *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—31

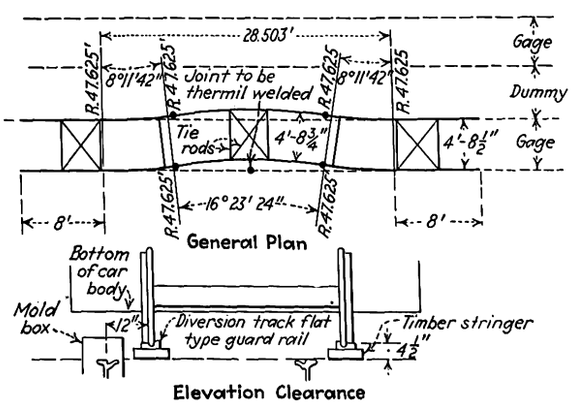
Diversion Track Facilitates Making Thermit Weld Joint Repairs*

By H. F. Merker

Chief Engineer of Ways and Structure Brooklyn City Railroad, Brooklyn, N. Y.

WHERE a large number of joints are to be welded the usual procedure is to remove traffic from the track. The Brooklyn City Railroad, Brooklyn, N. Y., found a particular demand for making repairs to individual joints which fail, and for this purpose a diversion track has been designed and built and is used successfully.

The rail used in this is a flat-guard type bolted to wooden stringers. The diversion is 1 ft. In the track, as shown, the end of the rail is placed 4 in. higher than the head of the rail in the permanent track. This permits the journal boxes of cars to clear the top of the mold box, although, if necessary, the mold box can be cut down several inches. Such a diversion track can be assembled and dismantled easily. It is light enough to be transported readily and occupies but a small space in a medium-sized truck. The run-off rails are similar to those used in portable cross-overs of the flat-rail type. Such an arrangement eliminates the costly practice of diverting cars or of using portable cross-overs.



Diversion track for use while making Thermit - welded joint repairs

* *Submitted in* Electric Railway Journal *Prize Contest.*

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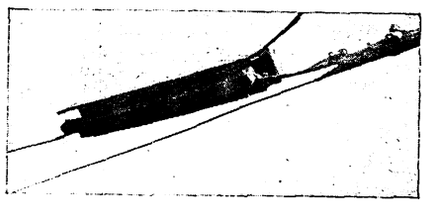
Electric Railway Journal Maintenance Data Sheet

LINE DEPARTMENT—6

Covers for Overhead Contactors Reduce Short Circuits*

By Charles Herms
General Foreman San Diego Electric Railway, San Diego, Cal.

CONSIDERABLE trouble was experienced on the lines of the San Diego Electric Railway, San Diego, Cal., during wet weather, from the current creeping to the track switch circuit plates on the overhead switch pans. This gradually burned a path across the insulation and caused a switch failure. Usually the resistance coils would burn out if the dashpot did not open. Several times the entire circuit control box was burned out. In some sections close to the sea coast, where salt air made it extremely difficult to keep exposed apparatus insulated, it was necessary to make repairs almost daily in wet weather.



Cover as installed over switch pan on the lines of the San Diego Electric Railway

These troubles have been overcome by the installation of covers over the switch pans of busy switches. This keeps moisture away from the parts. The cost of installation of the covers is small compared to the labor and material used in repairs where curves are not used.

* *Submitted in* Electric Railway Journal *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

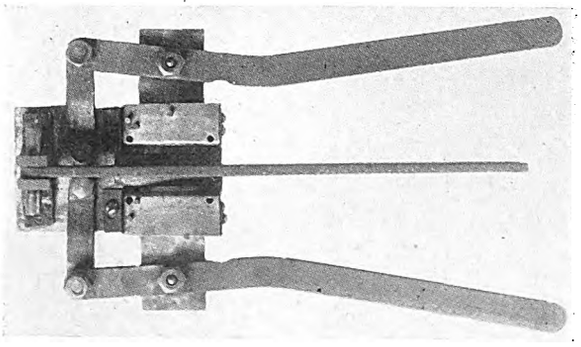
POWER AND ELECTRICAL DEPARTMENT—3

Armature Clip Forming Device*

By S. Sheppard
Electrical Department Toronto Transportation Commission, Toronto, Canada

FORMING of clips has been facilitated by a small, hand-operated device developed in the electrical department of the Toronto Transportation Commission. The principle of operation is best explained by referring to the accompanying illustration.

A strip of copper, previously cut to the correct size, is placed on top of the form between the guide pins. A steel core, placed on top of the copper strip, is then forced downward by the center lever, thus forming three sides of the clip. The center lever is then lifted and the two levers, one on either side, are closed together, completing the clip. The clip is removed and the steel core, which is very slightly tapered, pulls out quite easily. Use of the device has speeded up this work.



Device for forming armature clips

* *Submitted in* Electric Railway Journal *Prize Contest.*

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Electric Railway Journal Maintenance Data Sheet

LINE DEPARTMENT—7

Resisting Corrosion of Steel Poles*

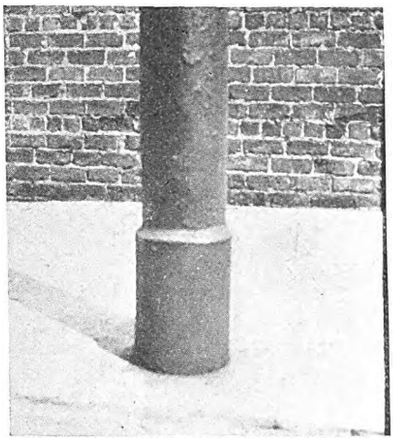
By H. G. Engelhardt

Engineer Railway Overhead Line Department New Orleans Public Service, Inc., New Orleans, La.

USEFUL life of a tubular steel pole is limited by the corrosion at the ground line. With reasonable precautions in inspection and painting, the life of a steel pole can be lengthened considerably. However, some poles fall short of receiving proper painting, and excessive corrosion sets in at the base and necessitates early replacement, although the upper portions may be perfect.

The New Orleans Public Service, Inc., has a very effective and inexpensive method of resisting corrosion at the base of steel poles. Before the pole is set a piece of standard wrought steel pipe, 2 ft. long and 1 in. larger in diameter than the pole, is slipped over the butt section. It is tied in position with a short piece of ½-in. tie line, its lower end being 5 ft. from the butt of the pole. The pole is then hoisted with a derrick and set in the hole and plumbed in the usual manner.

Three small wooden wedges are driven between the pipe and the pole to maintain a uniform separation of approximately ¼ in. Concrete is then poured around the pole and a very wet grout of 1 to 2 mix of cement and sand is poured in the separation between the pipe and the pole. The wedges are removed and the upper end of the pipe is chamfered with the grout to shed water, making the joint watertight. The pole is set the usual depth of 6 ft., which leaves 1 ft. of pipe remaining above the ground and 1 ft. below.



Typical installation of pipe sleeve on lines of the New Orleans Public Service, Inc.

The additional cost of setting a pole in the manner described is approximately $4. Such an installation costs considerably less than using the manufactured sleeve. However, this type of construction is limited to the setting of new poles only. The expense of stripping an existing pole for such an installation would not be warranted. There the manufactured split sleeve is the more economical.

* *Submitted in* Electric Railway Journal *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

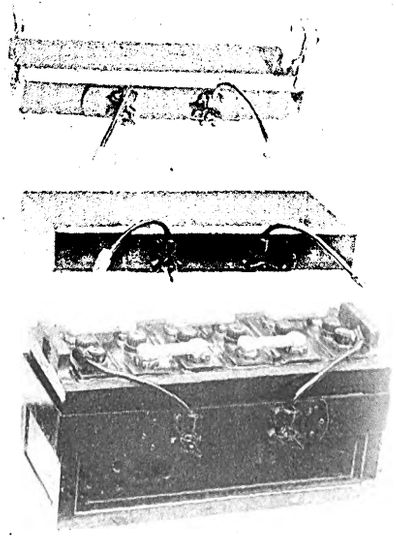
POWER AND ELECTRICAL DEPARTMENT—4

Combined Lifting Handle and Terminal Block for Rubber-Cased Batteries*

By F. W. Brash

Electrical Department Toronto Transportation Commission, Toronto, Canada

GREAT value is attributed by the Toronto Transportation Commission, Toronto, Canada, to a combined lifting handle and terminal block for batteries with rubber cases. Terminals placed on the side of a battery soon become loosened by the screwing on and off of the nuts. This is often exaggerated by the too common method of lifting the battery by the flexible leads, thus pulling out the terminals and chipping the rubber case. Such damages increase cost of repairs.



Combined lifting handle and terminal block for rubber-cased batteries

The new device includes a strap-iron band with handles attached to fit around three sides of the battery. The fourth side of the band is completed by a fiber terminal block upon which the terminals may be fastened much more securely. The case, which is larger at the top, may now be lifted by the handles on the band, while the battery leads prevent the band from slipping off at the bottom when not being carried. The iron band and handles are coated with acid-resisting paint.

* *Submitted in* Electric Railway Journal *Prize Contest.*

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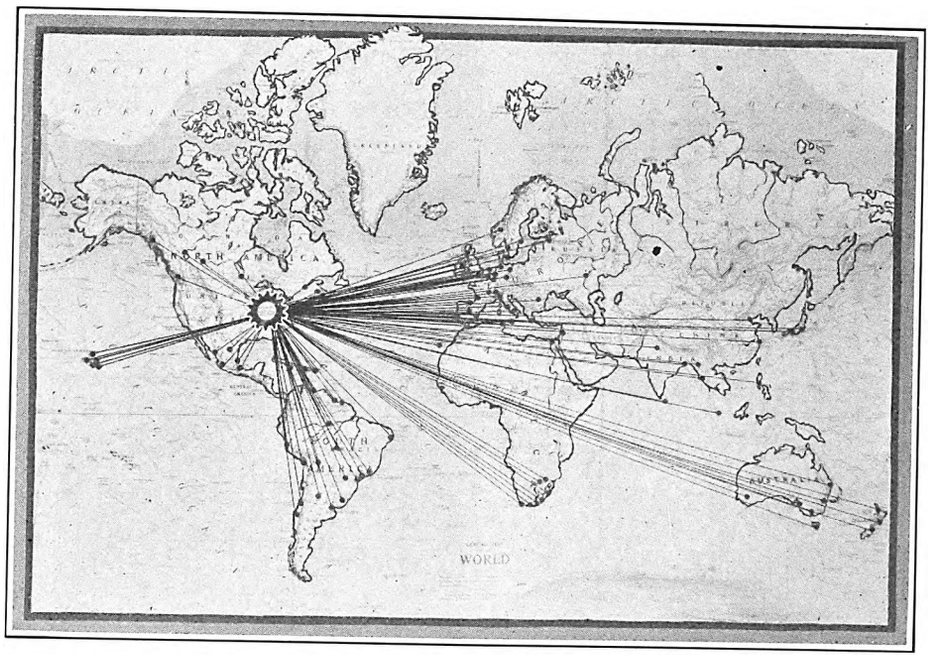

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THE BAKING OF ELECTRICAL INSULATION

The effective life of its insulation is the limiting factor in the amount of service to be expected from the electric motor—a fact that makes the choice and handling of insulating materials such an important matter in either its manufacture or servicing. Baking varnishes are materials of this class.

The rapidly increasing use of good baking varnishes for such parts as motor armatures, field coils, etc., is a direct result of the economic demand for equipment of greater dependability and service.

To be more specific, the use of a good baking varnish offers six distinct advantages on motor armatures and other electrical units which may be called on to operate under severe service conditions:

1. All the interstices in the windings and fabric covering are filled—air, moisture and dust are excluded—the dielectric strength of the insulation as a whole is increased, and the probability of insulation failure is greatly reduced.
2. Such treatment offers a greater resistance to ageing than any other of the liquid insulations of equal mechanical strength.
3. The armature or other unit treated has a higher degree of mechanical strength, the coils are fixed solidly in their slots and free from abrasion in case of a band wire failure.
4. The baking varnish acts as an effective seal for the seam between the commutator and the string band.
5. Baking varnish offers a high degree of resistance to cracking and shrinking by oxidation at service temperatures—increasing the effective service of the unit.
6. Dipping and baking of armatures insures the highest degree of uniformity obtainable in the finished product—thorough penetration of the insulation and better mechanical balance.

However, the baking varnish of itself is not sufficient in attaining these advantages. Its application requires care and above all the accurate control of temperatures and baking conditions, which can only be obtained with baking equipment scientifically designed and carefully constructed. Economy of operation in the baking department depends likewise on appropriate baking equipment.

Further details on the economy and practice of electrical insulation baking may be obtained from Young Brothers Company of Detroit.

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—36

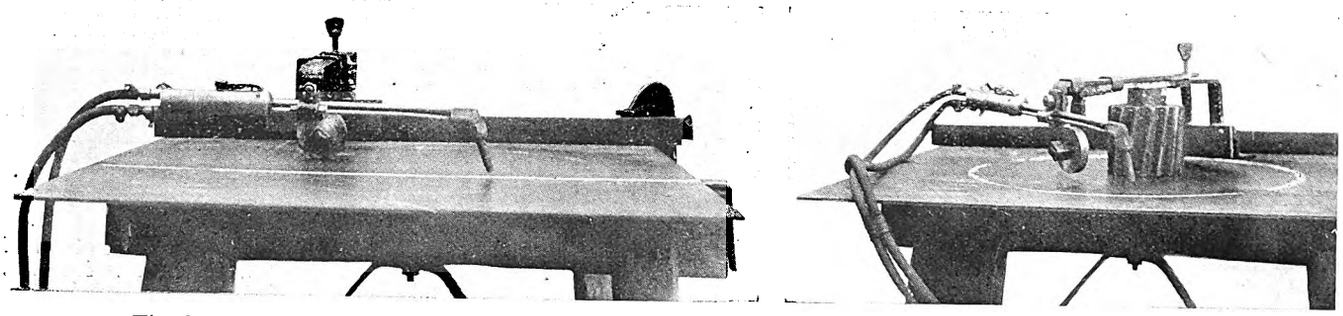
Acetylene Straight Line and Circle Cutting Fixture*

By Fred T. Cooper
Blacksmith Charleston Interurban Railroad, Charleston, W. Va.

FOR STRENGTH line and circle cutting with the oxyacetylene torch a cheap fixture has been found of particular value in the shop of the Charleston Interurban Railroad. This consists of an adjustable arm for holding the torch and a fixed member for clamping to the material to be cut. The adjustable arm slides back and forth from the main arm and is held in position by a thumbscrew. The main arm is fitted to an angle which in turn slides in the base angle iron guide clamped to the sheet to be cut. The work is held by a "C" clamp.

For straight cutting the operator, after clamping the angle-iron frame to the work, lights the torch and pulls or pushes the arm at a speed suitable to cut away the metal. Cutting lines will be free from ragged indentations.

For circle cutting the main arm is bolted to a round disk of metal about $\frac{1}{2}$ in. or $\frac{3}{4}$ in. thick. This is bored out in the center. The pivot is made by fastening this to an old motor pinion. This provides for rotating and by means of the adjustable arm any size circle can be cut. A roller wheel holds the arm at a fixed distance from the material.



The fixture at the left is arranged for straight line cutting, while, as shown at the right, circle cutting is done by pivoting the arm to a central block

* *Submitted in* Electric Railway Journal *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

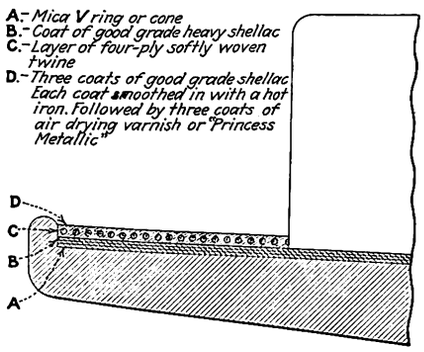
ROLLING STOCK—ELECTRICAL—52

Insulating Commutator Spark Bands

By John S. Dean
Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

IT IS of the utmost importance to give the mica V-ring or the cone extending beyond the commutator bars at the front end of the commutator, which is known as the spark band, a smooth, slick finish of insulating material. A dependable method which has stood up successfully under severe service conditions is indicated in the accompanying illustration.

It consists of coating the surface of the V-ring or cone with a good grade of heavy shellac and on this winding a layer of four-ply, soft-woven twine.



Insulation for commutator spark bands

Over this, three coats of shellac should be placed, each coat being smoothed in with a hot iron before the next is applied. The surface should be finished with three coats of air-drying varnish or Princess Metallic.

A smooth, even surface of the spark band produced in this manner can readily be kept clean and free from the detrimental oil and carbon dust which accumulate as a result of careless or indifferent maintenance. The spark band surface should be cleaned systematically by wiping with a clean, dry cloth at regular inspection periods.

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Electric Railway Journal Maintenance Data Sheet

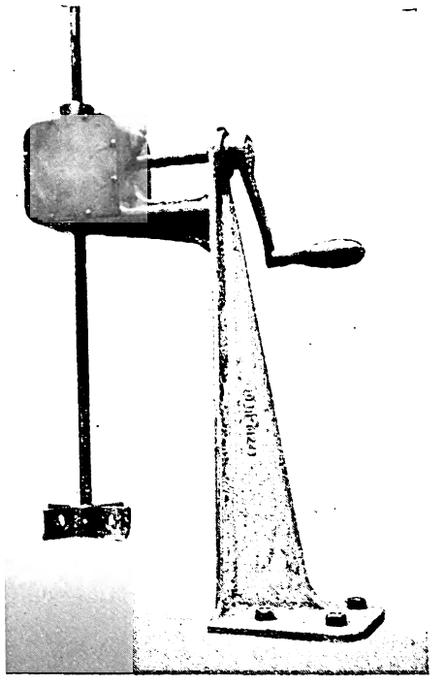
ROLLING STOCK—MISCELLANEOUS—37

Simple Paint-Mixing Device*

By H. S. Williams

Assistant Superintendent of Equipment Department of Street Railways, Detroit, Mich.

SPRAYING of paint is made easier and faster with a simple device used in the shops of the Department of Street Railways, Detroit, Mich. It has a standard which supports a splined vertical shaft, upon the lower end of which is a four-bladed paddle. The shaft and attached paddle are raised easily so a paint container can be placed in position. The shaft is driven by a hand crank through a set of beveled gears. This multiplies the hand-crank revolutions by three. Various sized paddles may be substituted readily to accommodate different sizes of paint cans. Such a device could also be arranged for motor drive where the amount of mixing warrants it, and paint mixing is thus made easy.



Paint-mixing device used in the shops of the Department of Street Railways, Detroit, Mich.

* *Submitted in* Electric Railway Journal *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—53

Three Repair Jobs Without Taking Armature from Lathe*

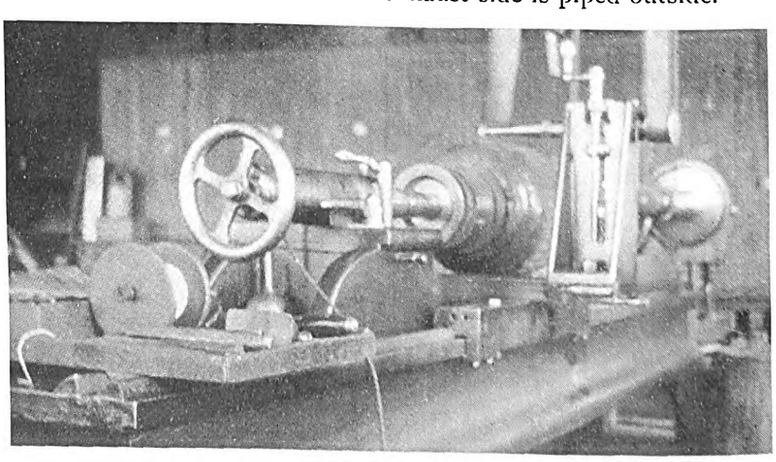
By R. T. Chiles

Master Mechanic Cumberland County Power & Light Company, Portland, Maine

BENDING, turning the commutator and slotting are done by one workman without removing the armature from the lathe in the shop of the Cumberland County Power & Light Company, Portland, Maine. This has been made possible by attachments to the lathe. A commutator slotting head, mounted permanently, is belt-driven from a 220-volt single-phase 1-hp., a.c. motor mounted overhead with an automatic belt tightener. The vertical feed is made in the slotter head and the cross and horizontal feeds are controlled at the lathe.

The slotter arbor is made in two pieces; a short section on the saw end of the arbor is screwed into a longer section, so that when an armature is put in the lathe it can be banded and the commutator can be turned without interference from the slotter saw by removing the short section. For slotting, the short section of the arbor is screwed into position again.

To carry off mica dust and make conditions more pleasant a small motor-driven exhaust fan has been mounted overhead. A tube from the fan is located over the slotter. The exhaust side is piped outside.



Attachment to lathe to provide for banding armature, slotting commutator and turning it without removal from the lathe

* *Submitted in* Electric Railway Journal *Prize Contest.*

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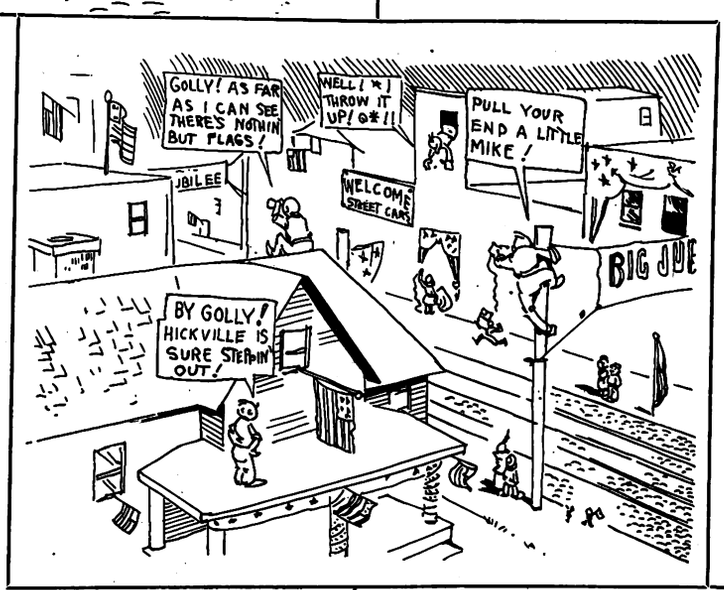
Adventures of

Old Man Trouble

on the

Hicksville Railway

A modern city is proud of a modern transportation system



THE best advertisement a city has is an efficient transportation system with loyal, attentive and courteous trainmen. Communities are built around it with the faith that it will be as permanent as the city itself. Improvements in a transportation system contribute to the value of the property it serves.

ELECTRIC RAILWAY JOURNAL will be glad to furnish press proofs of this page for posting on bulletin boards and will supply electrotypes at cost for use in company publications.

J. M. Zimmerman and E. L. Proctor, West. Elec. & Mfg. Co.

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Combination Pneumatic and Cushion-Tired Wheel

COSTS of bus tires may be reduced materially by a "shock-absorber wheel," now being tested by the Northern Ohio Power & Light Company, Akron, Ohio. It was developed by L. G. Smith, purchasing agent for the railway.

At the time the company started buying buses the vehicles were delivered on 36x6 tires. It was thought these tires were ample to carry the load. Experience demonstrated that the service obtained from them was much less than was expected. They broke in the side walls as a result of heavy loads during peak hours. It was found necessary to increase the size to 34x7 and later to 38x8.25. This added thousands of dollars to tire investment.

With the idea in mind of strengthening the load-carrying possibility of tires, and holding down repairs costs, Mr. Smith designed the Smith combination wheel. This consists of a cushion tire mounted between two pneumatics to act as a shock absorber.

Dick Prescott Rides a Street Car

And Asks Some Questions

ABOUT ten days after Dick Prescott, superintendent of equipment of the Consolidated Railway & Light Company, and his new assistant, Steve White, had discussed the advisability of an inspection trip to study the practices of other properties, they got started. This was their second trip. The first was shortly after Mr. Milburn came as general manager and ushered in a program of improvements which had completely changed the outlook of the entire organization.

Grand City was their first stop. The railway there had completed a program of rehabilitating a large part of its equipment, including conversion to one-man operation. Steve and Dick succeeded in resisting the exhortations of taxicab drivers and boarded a street car, which, from a prominently displayed sign, they learned passed directly by the two principal hotels of the city. The operator had evidently been instructed regarding the needs of strangers on the depot line, for when he reached the first of the two hotels he announced not only the name of the street but also the name of the hotel.

Within the car Dick noted another innovation. In one corner was prominently displayed a map of the transportation system on which were indicated the locations of principal buildings, hospitals, parks, hotels and places of interest in the city, including some of the larger industrial plants and business establishments. In the opposite corner was a map of the particular line on which they were riding, showing the principal street crossings and corresponding street numbers to assist the stranger in determining how far he was from his destination. Important information regarding transfer lines crossed by the route on which they were traveling was also included on this second map. At the bottom of each map this message was prominently displayed: "If you are in doubt as to how to reach your destination, ask the operator of this car. He is thoroughly posted on the shortest routes to all important locations in the city and will be glad to help you."

Dick and Steve studied both maps with great interest.

"Those certainly are a big help to a stranger," finally ventured Steve.

"Indeed they are," agreed Dick; "not only a stranger, but even a regular rider in the city who has occasion to go to some section with which he is not familiar."

"What do you think of the sign at the bottom?" asked Steve.

"Sounds friendly; doesn't it? Suppose we try it out and see if they mean what they say."

Accordingly, the two travelers approached the operator, who was at the moment busily engaged in collecting the fares of several boarding passengers. They waited until he had again started his car, and then Dick purposely addressed him in rather a familiar tone of voice. Not being acquainted with the city, he had picked a location from the map about which to ask.

"Say, buddy, how do I get to the Tigers' baseball park?"

He watched particularly to see whether the question diverted the operator's attention from his duties, and noted that the man never took his eyes from the street ahead.

"Sorry, sir, but the Tigers are not playing on their home grounds today. However, if you want to get out to their grounds, you take a No. 6 car going north at Swift Street about a mile from here. If you look at the map in the car you'll see that it's only a short ride after you transfer. It will take you about twenty minutes from here."

Dick was impressed by the man's friendly tone, and by the fact that he seemed to enjoy giving the information, although he kept his attention on the street ahead.

Just as he started to make another remark the car reached a corner and came to a stop for a waiting passenger.

"Just a moment, please," interrupted the operator as he turned to make change, "Be with you again in just a second."

The car got under way quickly.

"Sorry, sir," resumed the operator, "Did you have another question?"

"I didn't know the Tigers were out of town. When do they get back?"

"Next Saturday. They play the 'Blues' from Steelville."

"Thanks very much," replied Dick. "I think we'll get off at the Brown Hotel. Is that very far?"

"Block after the next, sir," replied the operator. "I'll call it."

"Thanks," again replied Dick. He and Steve then waited in silence until they alighted at their destination.

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Association Activities

An Outsider's View of the Industry's Needs*

By Harold V. Bozell
Bonbright & Company, New York City

ONE fact stands out to anyone making observations of the electric railway industry: From the point of view of capitalization it stands somewhere in the first ten industries in the United States. The intricate interrelationship of credit and investment in this country is such that naturally the financial and business world has an interest in the success or failure of an industry in which so much is invested. On the other hand, it cannot be overlooked that the electric railway industry largely has lost the confidence of the investment and banking world. Certain companies are making at least a partial if not a completely fair return on the money invested, but in many places companies are not making even a fair margin for reserves and there are instances where operating expenses are not being met.

A significant feature of the monthly statistics of the A.E.R.A. is that the nationwide total of passengers handled by the electric railways of the country, including their buses, stays about the same from year to year. This is, to say the least, not a bullish indication when we consider that the population of the country is steadily increasing. To be perfectly fair, however, there appear to be exceptions to this both ways, in that some companies are increasing their passengers carried and others are having decreases which are, at least, serious.

The traffic figures also show that there is a nationwide tendency toward a decrease of the proportion of passengers carried by rail and an increase of the proportion carried by bus. This is not disquieting as an indicator of the place of public transportation, but it does point to a problem involving business and financial judgment as to the proper adjustments to be made in shifting to a balanced operation, partly railway with heavy investment and lower unit operating costs, and partly bus with lower investment and higher unit operating costs. Again, this statement, as others, must be considered as a nationwide average, and subject to the necessary explanation that in some places rail passengers are on the increase and it should by no means be taken to be an omen that the bus will supplant the rail.

There is a feeling that the industry has been in worse throes than it is now and that while it is still in the position already outlined, that position is a point on the line of general improvement rather than of decline. Public mass transportation is necessary in American community life. Electric railways have been the victims of many factors such as the psychology of the fixed 5-cent fare, the load of burdensome and misplaced taxation, and still, in some localities, unrestricted competition from buses. Even a more important factor has doubtless been the enormous increase in paved streets and the unanticipated increase in automobiles, all of which has allowed people to do their traveling without the use of public transportation. The optimistic side of the picture is that, in spite of many factors which for years have worked against the steam railroads, including over-zealous regulation by the Interstate Commerce Commission, they are again enjoying a modicum of popularity in the business and industrial world. The electric railway, with bus systems co-ordinated in most localities in the country, is a local institution. The solution of its problems may be slow in being found, but that there must and will be some satisfactory solution to keep the electric railway in successful operation seems certain.

Widespread use of the automobile has meant a thinning out of distributed population and further reduction of the density of those using public transportation facilities. To operate any public transportation agency in reduced density means longer average rides and calls for higher average fare per passenger or lower operating cost. Such devices as express rail operation with buses to feed; private rights-of-way to keep tracks free from other surface vehicles; modernized equipment, parking restrictions for automobiles—all of which permit both more car-miles per car-hour and more appeal to the riding public—constitute lines of attack along which beneficial results may be obtained.

One very definite thought which occurs to many people analyzing the industry today is that the principal competitor of the electric railway is more frequently the private automobile than the competitive bus. The automobile is designed to wear out or be relegated to second-hand uses at the end of two, three or four years. Electric railway cars are designed for a life of twenty years or more. The automobile industry maintains extensive research departments and anticipates demands of the riding public. Change is ever present. Except for a few experimental street cars recently constructed and one or two other new projects which it is understood are now under way, there has been no fundamental modification of electric railway rolling stock since the introduction of the one-man car—and that was more an operating modification than a fundamental modification. True, cars have been improved so that they are more attractive and seats are more comfortable. Even that trend, however, is of comparatively recent origin. Some companies have gone far in reducing weight of equipment, but there has been little development comparable to that which the automobile industry is constantly making, and there has not yet been an answer to the question of the reduction of the noise. Can there not be something along the line of a really new rail vehicle built to the economic pattern of short life, low first cost, yet inviting performance from the standpoint of comfort, quiet, speed and economy of operation?

A factor which doubtless is working toward the improvement of the mass transportation industry is that our

*Abstract of a paper presented before the Central Electric Railway Association, Cedar Point, Ohio, June 28-29, 1928.

COMING MEETINGS OF *Electric Railway and Allied Associations*

July 25-27—Electric Railway Association of Equipment Men, Southern Properties, Hotel Gibson, Cincinnati, Ohio.

July 27-28—Central Electric Railway Accountants' Association, Detroit, Mich.

Aug. 16-17—Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.

Sept. 7—Maryland Utilities Association, mid-year meeting, Braddock Hotel, Braddock Heights, Md.

Sept. 7-8—Central Electric Traffic Association, Potawatomi Inn, Angola, Ind.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

Sept. 25—Central Electric Railway Master Mechanics' Association, Cleveland, Ohio.

Oct. 1-5—National Safety Council, safety congress, New York, N. Y.

Oct. 8-12—American Welding Society, fall meeting, Philadelphia, Pa.

Nov. 14-15—Public Utilities Association of Virginia, Roanoke, Va.

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streets are becoming more and more congested. Without doubt more extensive provision for the use of the private automobile is desired and will be made but it seems inconceivable that provision can be made extensive enough but that there must come a dropping off in the rate of increase in use of private automobiles. Therefore there will be some resultant reversion to the use of public transportation agencies.

The congestion of intercity highways is slowing up the delivery of package freight by truck. More highways will doubtless be built, but again there is limitation to the ability of the truck to handle everything, and even now truck companies are making proposals to electric railways to handle the shipment of goods for part of the distance for which the truck company has undertaken to make delivery.

It is well to bear in mind that the country-wide system of hard roads was made possible by the demands of private car owners. Just how far these roads may be pre-empted for commercial hauling without producing a popular reaction and consequent restriction of their use must not be overlooked in considering the relation between rail and highway transportation of both freight and passengers.

New Fare Philosophy Needed in the Industry

I cannot escape the conclusion that throughout the entire history of the electric railway industry there never has developed what might be called a complete fare consciousness or philosophy. There have been a few outstanding examples of breaking away from tradition and of recognizing that there are various kinds of rides to sell. The results are conclusive enough to indicate that there may be some hope in that direction. As a layman, I believe it desirable to have a 10-cent cash fare with a reduced rate token or ticket for the regular rider where possible. This plan allows changes of the fare that most of the riders use, and also allows changes smaller in proportion than that of a full cent. Weekly tickets, off-peak riding inducements, etc., may be added to entice various classes of riders.

Some two or three years ago the advisory committee on finance of the American Electric Railway Association made a report which gave concrete evidence of the attitude of the investment banking fraternity and made certain definite recommendations. That report still represents the views of that fraternity. Observation would indicate that there has not been any widespread activity to follow its recommendations. The principal step recommended is admittedly an uphill, difficult step to take. Some companies have done work along that line and others are doing so today. A re-examination of that report I believe to be worth while.

Somewhat disturbing, when one considers the future of the industry, is the apparently small number of able young men going into it. It is not drawing the well-trained young men of the country to the extent that other industries are doing in which there is more apparent hope of financial reward. It would be worth while if some way could be found to encourage the right kind of young men to join your ranks.

As a presentation of the outsider's viewpoint of the electric railway industry as it is today, I would not be giving you a true picture of my own attitude if I did not emphasize again that I believe there are ways now under test in various places in this industry which are helping to speed up its recovery from its worst days. When these and some others still in your minds but not yet in practice are applied, the industry may, without excessive optimism, look for accelerated improvement in its financial showing.

Electric Track Switches*

By M. Riedel
Manager of the Essen Street Railway, Essen, Germany

OWING to the lack of time available to the author after the assignment of this subject, he has had to confine this paper to a discussion of German practice.

The simplest form of electric track switch is one made up of two solenoids, one to throw the switch tongue in one direction, and the other in the other direction, as shown in Fig. 1. Each solenoid is operated by a contactor on the trolley wire. The motorman controls the movement of the switch by passing over one contactor with the current on, and the other with current off. This plan has the objection that it is difficult for the operator always to tell when the car is exactly under the contactor from which he wishes to draw current. Hence, a modification of this design has been brought out, using only one solenoid and one contactor. In this design, if the motorman wishes to change the position of the track switch he operates over the contactor with the current on. If he wishes it to remain as it is, he coasts over the contactor.

A further development is the use of an electrical relay between the switch-operating solenoids and the trolley wire. The purpose of this relay is to give a positive movement to the switch tongue, not always possible when the energizing current for the movement of the switch is that taken during the passage of the trolley wheel under the contactor. One form of relay switch is shown in Fig. 2, the relay being at *R*. *U* is a contact device for interlocking the contact. With this apparatus, the motorman who wishes to change the position of the tongue passes over the contactor with the current on. In this illustration the operating mechanism is shown as a pair of solenoids, but a motor can be used in their place, if preferred. By a simple connection to any one of these switches, signal lamps can be connected up to show the position of the switch tongue if desired, or connections can be arranged to operate an automatic block.

Any electric track switch operated from a single contactor can be arranged in one of two ways. In one (a) the motorman passes over the contactor with the current on, when he wishes to change the position of the switch tongue, and without current when the tongue is in the right position and no change is desired. In the other method (b) the switch tongue is arranged always to be in one position when the motorman passes over the contactor with the current on, and in the other position when he passes the contactor without current. Fig. 3 shows the connections for this plan. At first it was supposed that plan (a) was the best because it obligated the operator to look at the switch before he entered. This is objectionable because sometimes the position of the switch tongue is hard to see at night or in foggy weather, and it has to be illuminated. Again, the operator has to watch every switch and manipulate his control quickly when he sees its position. Operating preference now among the larger companies of Europe is for method (b). The motorman becomes accustomed automatically to the movement at each corner, is better able to follow the traffic on the street and is less apt to make a mistake. With this plant it is desirable to have a standard movement for all switches.

Still another combination possible is to have a standard position for the switch tongue and have it return automatically to that position after being thrown by a car to the other position. This is thought to have some advantages where the standard position is for the main line and the opposite position for a branch line. In the writer's opinion, however, this advantage is more than outweighed by the disadvantages. If by chance the switch should stay in position for the branch line, it is difficult for the car operator to return it to place. Moreover, derailments have occurred with cars following closely after each other, without time for the switch tongue to return to its standard position.

Where operation of the switch depends on the use or non-use of current for the car when it is passing under the contactor, difficulties have been experienced when the switch and contactor are at a grade. On an ascending grade with the current off, the momentum of the car is sometimes insufficient to pass it through the switch. On a descending grade, current on might give the car too great a speed. In such cases, if an electric track switch is desired, it may be connected up to be operated by a two-pole switch mounted on an adjoining pole.

The underground box holding the switch-operating mechanism should be

* Abstract of paper presented at the biennial meeting of the Union Internationale de Tramways, de Chemins de fer d'Intérêt Local et de Transports Publics Automobiles, held in Rome, Italy, May 6-12, 1928.

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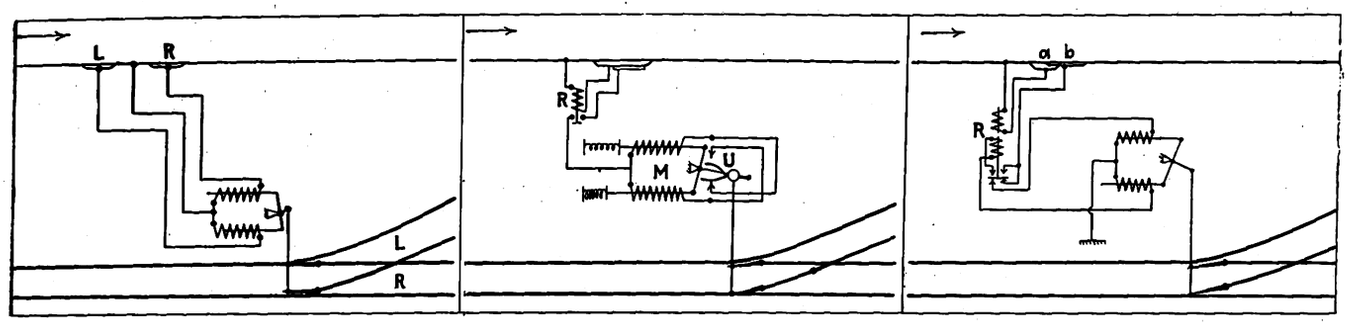

At left—(Fig. 1)—Simple solenoid-operated switch. In center—(Fig. 2)—Relay operation with interlock. At right—(Fig. 3)—Modification of connections of Fig. 2

water-tight and the electrical apparatus in it should be as simple as possible. A single solenoid runs the danger of damage to its winding, so that it will not operate in both directions. Damage of this kind is more likely when the winding is continually under trolley voltage and is subject to injury from lightning discharge. From this point of view, the use of two solenoids is better, since the danger of both being put out of business at the same time is less than with only one winding.

Another difference possible is in the arrangement of the windings on the solenoid. Where the solenoid operates from the current taken while the car is passing under a contactor, this current is apt to vary within wide limits according to the speed of the car, and the operator must notice to see whether enough current is taken to throw the switch. This disadvantage does not obtain for the relay system where the solenoids are fed directly from trolley voltage. Here the power available can be determined once for all, and the switch will operate positively even if the controller is on its lowest notch. For this reason relays have been adopted exclusively on the Essen system. Signal lamps showing the position of the switch can be used, but the best means of preventing accidents is a good light shining on the switches, as it also tends to diminish the danger of collisions with other vehicles.

Motor for Shifting Tongues

The weight of switch tongues calls for the employment of sufficient apparatus to throw them. Where a motor is used, a ½-hp., 300-r.p.m. motor can change the position of the switch within one second. A friction coupling prevents the gearing from being damaged if the switch tongue should get jammed. The wear of the motor is very small even for the brushes and commutator, because it runs for only a short time. After six months service in Essen of a motor-operated switch, the tips of the carbon brushes have not even yet begun to take the circular form of the commutator. The overhead contactor used with the motor-operated switch is a little longer than that where solenoids are used. The car crews believe that a switch operated by a motor does not function as well as those by solenoids because the tongue does not change position with a rush, but more gradually. In consequence, the men pass the overhead contactors of such a switch with more care and rather slowly. This is not an objection; in fact, it is an advantage.

It is difficult to express in money value all the advantages of electric switches, but it is safe to say that the expense of installation is soon made up in most cases by the saving in labor and reduction in number of stops.

Electric switches should always be arranged so that they can be moved by hand, if necessary. Electric switches ought to have a positive movement and such spring arrangement that they will not be thrown by vehicle wheels.

Second National Fuels Meeting

UNDER the sponsorship of the American Society of Mechanical Engineers the Second National Fuels Meeting will be held in Cleveland, Ohio, on Sept. 17-20. The program, which recently was completed, includes papers on coals and preparation of coal, recent developments in boilers and methods of boiler water conditioning, developments in power plant construction, progress in use of pulverized coal, railroad practice and smoke abatement.

Victor J. Azbe is chairman of the fuels division executive committee.

American Association News

American Executive Committee

REPORTS by the several committees handling arrangements for the coming Cleveland convention occupied the major attention of the American Electric Railway Association executive committee at a regular meeting held on board the yacht *Florida* on July 13, 1928, as the guests of Barron Collier. Those present included President R. P. Stevens, J. H. Hanna, Lucius S. Storrs, Barron Collier, W. H. Sawyer, J. S. Kubu, R. H. Dalgleish, Edward Dana, M. B. Lambert, S. J. Cotsworth, C. R. Ellicott, H. C. Aller, representing A. S. Grenier; E. F. Wickwire, T. W. Casey, J. R. Fitzpatrick, F. R. Coates, J. H. Pardee, R. F. Carbutt, J. W. Hancock, W. S. Rodger, W. C. Slade, E. C. Faber, L. H. Palmer, J. W. Welsh, E. J. Murphy, Labert St. Clair, F. C. J. Dell, Charles Gordon, J. Vignee and Robert Dougan.

Further progress in the convention program arrangements was reported by Chairman Coates. Acceptances have been received from most of the speakers and in addition arrangements have been made for the speaker for the Advisory Council program Tuesday evening of convention week. Plans have likewise been completed for luncheon conferences similar to those which proved so popular last year. At each a sponsor will guide the discussion. The buffet plan of serving lunch will be followed so as to conserve time. President Stevens commented on the high character of the program which has been arranged and congratulated the committee particularly on the fine array of speakers and the excellent balance in the treatment of the several subjects, which are of outstanding interest to the industry.

Publicity Material Issued

Work of the publicity committee, as outlined in a report by Barron Collier, vice-chairman, has culminated in the issue of a supplement to the advertising handbook prepared originally by the committee. With the supplement there now are available approximately 5,000 samples of electric railway advertising, carefully selected to furnish suggestions to member companies. A publicity program has been planned to stimulate attendance at the convention. The first mailing pieces have already been issued.

Vice-chairman Casey reported for the membership committee. An abstract of the report is published elsewhere in this issue. Secretary Welsh reported on the association's finances in the absence of Chairman T. A. Kenney. Actual receipts and expenditures indicate close adherence to the budget. With a loss in revenue of approximately $16,000, due to resignation. Receipts for the year are expected to fall within a very small amount of the estimate made when the new schedule of dues was inaugurated with the adoption last year of the revised constitution.

For the publications committee,

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Chairman Hanna reported on the meeting held June 1, 1928, to consider generally the result of the new publishing plan for *Aera*. The committee felt that the improvements made in the magazine and its increased value to member companies justified an effort to increase the circulation. Accordingly a letter was sent out over the signature of Managing Director Storrs, asking for expressions regarding the character of the publication and suggesting the advisability of increased circulation among the rank and file of electric railway employees. A total of 53 replies to 338 letters sent out, were received up to the time of the report. Of these, 40 expressed approval of *Aera* in its new form, six suggested further improvements, three were dissatisfied with the changes that have been made and four expressed no opinion.

Entertainment at Cleveland

With the selection of an orchestra and a soloist, entertainment plans for the convention have been practically completed and there is assurance that this feature of the week's program will exceed in popularity anything attempted within recent years. On the recommendation of the entertainment committee and with the strong indorsement of President Stevens, the executive committee approved the engagement of Rolfe's nationally-known orchestra. Since dancing is to be one of the principal forms of entertainment the committee felt that the character of the music was of utmost importance and that the success of this feature is assured by the selection of Rolfe's Palais d'Or orchestra, whose dance music is one of the regular radio features from station WEAF. Another musical feature of outstanding merit will be a song recital by Miss Phoebe Crosby, on Tuesday evening of convention week.

A new poster being prepared by the committee on co-operation with manufacturers was described by Chairman Wickwire. This will be prepared in large size and will be known as the "Pay-Day Poster." Its purpose will be to call to the attention of manufacturers' employees that the business of electric railways helps to fill their pay envelopes.

Car Replacements Necessary

In the absence of Chairman L. C. Bradley, Mr. Storrs outlined the report of the committee on electric railway finance, calling attention to the importance of car replacements in the rehabilitation of electric railways and opening the way for the extension of more liberal terms in the financing of new car purchases. The committee suggested that advance publicity be given to this report, so that it might receive the attention from the entire industry that its importance warrants.

A report by the hotel committee, read by Secretary Welsh, indicates that the number of people to be accommodated at Cleveland this year will exceed those attending last year's convention. Reservations exceed by 177 rooms and 226 people the number requested at the corresponding date last year. Although the Cleveland and the Hollenden Hotels have been practically filled, there are ample rooms available in the several other hotels to insure satisfactory housing of the convention.

The transportation committee, through its chairman, Mr. Faber, reported on arrangements for special trains and reduced fare rates to the convention. In addition to a round-trip rate of 1½ times the regular one-way fare and good for the period of the convention, there will be another round-trip rate this year of 1⅝ times the one-way fare, good for 30 days. Special trains will be run from New York Friday evening, Sept. 21, on both the Pennsylvania and New York Central railroads, to arrive in Cleveland on Saturday morning, Sept. 22. A special train from St. Louis will leave on Friday night, and special cars will be attached to trains leaving Saturday night. From Chicago special cars will be attached to trains leaving Friday, Saturday and Sunday nights.

A report on the recent meeting of the International Electric Railway and Bus Association held in Rome was made by T. W. Casey, the American Association's delegate. Mr. Casey outlined the proceedings and called attention particularly to the effort being made in Europe to use cars and buses with one man, and to the attention being given American practice in this respect.

Affiliated Association Matters

Reports were received from the presidents of the several affiliated associations. President Stevens called upon representatives of the several state and sectional associations who were present.

The death of Past-President Robert I. Todd, was announced, and a committee was appointed to draft resolutions expressing the association's grief and appreciation of Mr. Todd's personality and accomplishments. It was also considered appropriate to prepare resolutions expressing the association's appreciation of J. K. Choate, recently deceased, an outstanding leader among the industry's pioneers.

A motion was adopted that the executive committee open to all convention delegates its next meeting, to be held in Cleveland, at 10 o'clock Saturday morning, Sept. 22, for the consideration of final reports of standing committees.

Since the executive board of the Bus Division of the American Automobile Association is to hold a regular meeting in Cleveland during convention week, it was voted to extend guest privileges to all members of that organization, following the precedent established at previous conventions.

Luncheons Again a Feature

FIFTEEN luncheon conferences for the interchange of experiences and discussion of outstanding problems will be an important feature of the convention at Cleveland this year. These luncheon groups met for the first time last year. Each was limited to 50 guests, and almost without exception more than this number sought admission and all could not be accommodated. This year a limitation again will be set on the number of guests, and the only way a person can insure a place at the luncheon or luncheons he wishes to attend is to make an early reservation.

Luncheon meetings will be held on every day of the American program, from Monday to Thursday, Sept. 24-27 inclusive. The tentative program of meetings as prepared by the meetings and subjects committee follows. In some cases, not more than two or three, there may be changes in the sponsors, but in the main this program will stand.

Day	*Subject*	*Sponsor*
Monday....	Safety.....	James P. Barnes
	Fares.....	C. D. Emmons
	Taxation.....	W. A. Jackson
	Manufacture.....	E. F. Wickwire
Tuesday...	Interurbans.....	D. W. Snyder, Jr.
	Traffic.....	E. J. McIlraith
	Education.....	Edward Dana
	Merchandising...	Barron Collier
Wednesday.	Financing.....	Luke C. Bradley
	Public Relations..	W. E. Wood
	New Cars.....	J. R. Blackhall
	Small Cities Problem of Transportation.....	Harold L. Geisse
Thursday..	Freight.....	L. M. Brown
	Management.....	R. F. Cartutt
	Motor Bus.....	A. M. Hill

These luncheon meetings have developed real discussion, something that has been sought in association conventions for many years. They give younger men in the industry the benefit of the experience of older men, and give the older men an opportunity to find out just what young minds are thinking.

New Association Members

ELECTION of one operating company, ten manufacturers, two state associations and ten individuals was effected at the meeting of the executive committee of the American Association held on July 13. A list of the new company members follows:

Operating

East St. Louis, Columbia & Waterloo Railway, East St. Louis, Ill.

Manufacturer

Canadian Cleveland Fare Box Company, Preston, Ont., Canada.

Chase Appliance Company, New York, N. Y.

Delco-Remy Corporation, Anderson, Ind.

Everhot Manufacturing Company, Maywood, Ill.

Four-Way Lock Company, Cleveland, Ohio.

Hudson Electrical Heating Corporation, New York, N. Y.

James H. Matthews & Company, Inc., Pittsburgh, Pa.

Oliver Iron & Steel Corporation, Pittsburgh, Pa.

Whitcomb Wheel Company, Kenosha, Wis.

White Manufacturing Company, Elkhart, Ind.

State and Sectional Associations

Indiana Public Utility Association, Indianapolis, Ind.

Missouri Association of Public Utilities, St. Louis, Mo.

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News of the Industry

Progress on Boston Legislation

Governor Fuller declines to prorogue the Massachusetts Legislature before it has done something with the Boston Elevated Railway situation. Some progress has been made as a result of the Governor's insistence. The House has passed to be engrossed the bill to extend the Boylston Street subway under Governor Square, with the provision that half of the cost is to be paid by the Elevated and the other half by the cities and towns in which the Elevated operates. A special commission is to be appointed by the Supreme Court to apportion the cost.

Another measure passed for engrossment provides for a special commission to investigate the further rapid transit needs of Boston, Chelsea, Revere and vicinity. This calls for the appointment of one member from the Senate, three from the House, two to be appointed by the Governor and one by the Mayor of Boston—a total of seven members.

The third proposition remains unsolved and Governor Fuller is considering the matter of writing another special message. This relates to the control of the Elevated. The twelve-year extension bill which came from the special committee after the Governor's latest message was passed by the Senate and killed by the House. Now the Governor proposes to hold the Legislature in session to consider further suggestions on that point.

Tire Man Heads Akron Transportation Committee

Charles W. Seiberling, vice-president and treasurer of the Seiberling Rubber Company, has been named chairman of the fact finding committee recently appointed by the City Council to look into the transportation situation in Akron, Ohio. The survey will include all phases of the question relative to operating costs, income, profit and other matters incidental to the operation of the railway and bus systems.

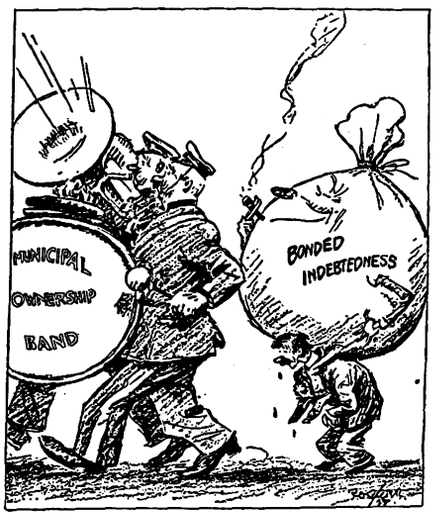
Councilman Pierce Schneider, chairman of the Council public utilities committee, said:

The survey will be thorough and will give the taxpayers of this city a definite report on the transportation situation before the proposed new franchise is drawn up for presentation to voters this fall.

The present franchise expires in December. Whether the new franchise will differ from the temporary one under which the company now operates will depend largely upon the report returned to Council by the fact finding committee.

Members of the committee are Charles W. Seiberling, vice-president and treasurer of the Seiberling Rubber Company; Frank H. Adams, former treasurer of the Goodyear Tire & Rubber Company; Attorney Edwin Brouse; P. T. McCourt, contractor; James B. Pergin, president and treasurer of the Central Hardware & Stove Company; Benjamin F. Graves, linotype operator at the Akron *Times-Press*, and Guy E. Shumaker, head of the transportation committee of the Goodyear assembly.

End of the Parade—The Horribles



There is magic in music. Dark magic. As every politician knows. And so the band is never missing from election propaganda. Its blare of brass, beat of drums and clashing of cymbals thrill the crowd.

All eyes and ears are for the marching musicians and their stirring strains. Cheers! Cheers! Cheers! For the drum major, for his smartly dressed crew, for the tune they are playing. Vote for This; Vote for That! is the melodious appeal. And votes are seldom lacking. The Pied Piper gathers his voters and leads them to the polls.

In San Francisco the Municipal Ownership Band has led the procession and marching feet have kept step to the rhythmic "Bonds, Bonds, Vote More Bonds!"

Now the Big Parade has passed and so have municipal ownership projects to a total of $129,500,000. Bringing up the rear of the disbanded procession is the Horribles section. Horrified, the crowd shuts its eyes and turns its back on the small man carrying the big load of bonded indebtedness. But the picture cannot be shut out. Though the band has gone, the burden of municipal ownership remains.—San Francisco *Bulletin*.

Prospects Remote for Early Use of Cincinnati Line

A special joint committee of the Rapid Transit Commission of Cincinnati, Ohio, and a committee of the City Council conferred recently with Walter A. Draper, president of the Cincinnati Street Railway, about the possible operation by Mr. Draper's company of the unfinished rapid transit system, which already has cost taxpayers $6,000,000. Mr. Draper said that his company could not take over operation of the system, even if its financing and completion were approved by the voters, under any terms which the city could afford to accept. The general feeling in the joint committee, openly expressed, was that the people would not vote more money now for the work.

Mr. Draper's statement of what his company could afford to undertake meant in effect that the only possible basis of operation from his point of view would be one in which the company would be guaranteed against loss. He based his attitude upon an analysis of the Beeler report on the rapid transit situation made by Drum & Company, who estimated a deficit of $818,339 for 1930, the proposed first year of operation, ranging down to a deficit of $51,118 in 1934, and mounting to a profit of $111,041 in 1935. Mr. Beeler estimated a deficit of $26,111 for 1930, with a deficit of $39,560 the next year and then ranging up to a profit of $480,777 in 1935.

After discussion of all these elements the Rapid Transit members of the committee adopted a recommendation that the commission turn over to the Council committee all its data on the subject. The Council's committee will recommend postponement of the project until more practicable means of financing may be found.

The two major ideas toward more satisfactory financing are the proposal to obtain state legislation enabling the levying of about $2,500,000 of the construction cost on property owners who benefit by the line and the insistence of Mayor Seasongood that St. Bernard and Norwood should be made to help pay for the system because they would benefit so largely from the operation of the line.

Another legislative amendment that probably will be sought this winter so the decks may be cleared for possible future completion of the system will be permission to issue bonds on a 50-year sinking fund basis instead of on a serial basis. This would enable the system to get a better start financially in its early years of operation.

The committee that conferred with Mr. Draper had been named to discuss

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the feasibility of negotiating an operating lease and its submission with a bond issue to the people. A bond issue of this kind would have called for $8,000,000 to $10,500,000, the $6,000,000 voted in the beginning already having been spent. The committee consisted of E. W. Edwards, chairman; P. O. Geier, B. H. Kroger and Christian Schott, for the commission; Tyler Field, chairman, Fred Schneller and Charles O. Rose, for the Council.

As matters appear to stand now an additional sum of $10,000,000 is required to be spent in order to realize on the present $6,100,000 investment.

C. C. McChord Retained in Philadelphia

State commission, city and Philadelphia Rapid Transit Company to draw up temporary agreement for operation of Market Street subway. 7½-cent fare urged pending final settlement

FOLLOWING the receipt of a joint petition from the city of Philadelphia and the Philadelphia Rapid Transit Company, in the matter of a proposed lease of the Broad Street subway, the Public Service Commission has engaged the services of Charles C. McChord, Washington, to make a survey, report and recommendation, upon the factors and elements involved.

The commission has also directed its bureau of engineering to make a study and report upon the feeder lines that will be necessary or advisable in order to render the Broad Street subway useful and available to the largest possible number of passengers. The commission considers the subject of feeder lines, particularly for the northern and northeastern sections of the city, one of the most important in connection with subway operation. The bureau will start immediately upon this work and will invite the co-operation of the department of transit and the Rapid Transit Company.

As the commission sees it, in taking these steps, it undertakes the duty which devolves upon it, under the provisions of the Public Service Company law which have been invoked by the Mayor and Council, since its purpose is to establish a sound and equitable basis upon which the great subway project may be made most serviceable to the public.

In acting as it did the commission has taken cognizance of the message of Mayor Mackey to the City Council in which it was indicated that the subway might be ready for operation on Sept. 1. The commission sees no insuperable difficulty in beginning operation at a given date prior to the determination or consummation of the terms of a lease, provided the city and the railway are willing to enter into arrangement for operation on a temporary basis. On this point the commission says:

> One advantage of such an arrangement, even for a short period, would be that it would provide figures of actual results to supplement and confirm traffic estimates upon which calculations of revenues and expenditures must be based. This would particularly be the case if the subway operations should be started on the same rates of fare as now apply on the present lines of the Rapid Transit Company.

In a voluminous report to the commission last year, Mr. McChord recommended that the city take over the underlying companies of the P.R.T. system at an estimated cost of $136,000,000, a program upon which the Mackey administration already has embarked. He also suggested that the city turn over the Frankford elevated, as well as the Broad Street line, to the P.R.T. rent free, notwithstanding the city is now receiving $780,000 a year rental from the city-built elevated; that the city should waive P.R.T. payments of paving tax, about $600,000 a year; that the city waive payments of dividend taxes to the underliers, about $115,000 a year; that the city arrange a guarantee for the payment of the P.R.T.'s 7 per cent preferred dividends and an 8 per cent dividend on its common stock; and, finally, that the city should commit itself to acquisition of the entire P.R.T. system in 1957, for the par value of its outstanding stocks, now authorized up to $65,000,000.

An official statement says:

Judge McChord was selected for this important work by the commission because of the fact that his previous investigation into general transit conditions in the city of Philadelphia, in addition to his long public experience in transportation matters, eminently fit him for the task. Judge McChord has been given full powers by the commission to make his studies complete and comprehensive.

He has accepted the work with the understanding that he will make thorough study and analysis of all the conditions that should enter into the consummation of a lease that will be fair and equitable to both city and company, as well as dealing fairly with the interests of the car rider and the taxpayer.

The work under Judge McChord's direction will proceed as expeditiously as possible, but, as is obvious, no fixed time can be set for his report to the commission. Fortunately, the commission has available in its own records and studies considerable data bearing upon the Broad Street subway, and it is the commission's understanding that the city's Transit Department and the Rapid Transit Company also have traffic studies and calculations available in reference to the subway's operation. These data are all contained in previous reports upon the subway and other transportation operations. They give a substantial basis upon which Judge McChord's work will proceed and will save a great deal of time.

McChord Called in Again

CHAIRMAN AINEY, of the State Public Service Commission, yesterday made it evident that it is the purpose of the commission to co-operate with the city and the Philadelphia Rapid Transit Company in framing an agreement for the operation of the Broad Street subway. The employment of Charles C. McChord to make a study of the situation, supplementing his previous investigation made at the instance of the commission, is itself significant. For the report of 1927, made by Mr. McChord, was in close harmony with the known preferences and program of the P.R.T., and in retaining its author for another report the commission indicates its hope of an amicable understanding.

There is also food for thought in the intimation by Chairman Ainey that it may still be possible to carry out the Mayor's plan to have the subway in operation by Sept. 1, at the present rate of fares, under a temporary agreement between the city and the P.R.T., pending a final determination of the lease questioned by the commission.—Philadelphia *Ledger*.

Sunday and Holiday Pass in Oakland

Authorization was given the Key System Transit Company Oakland, Cal., on July 10 by the Railroad Commission to establish for a period of approximately 60 days, starting July 15, a Sunday and holiday pass, to be sold for 25 cents, entitling the holder to an unlimited number of rides on the street cars and buses in the east bay cities. This experiment in the east bay territory is an endeavor on the part of the company to establish fares that will attract additional patronage.

The Railroad Commission in a recent decision refused to authorize the railway to increase street car fares, but in denying the application the commission suggested that an experiment be made with some form of fare that would have more chance of success than a horizontal increase.

Only One Amendment to Omaha Grant

Only one amendment has been added by the City Council of Omaha, Neb., to the ordinance submitting at the November election the question of granting a 30-year franchise to the Omaha & Council Bluffs Street Railway. This amendment, a proposal that all mail carriers in uniform shall be carried free, was opposed by President Shannahan as unfair, but it was arranged that the government should pay direct to the company the entire appropriation for defraying the way of men on duty. Practically all of the local opposition that defeated the franchise in the form submitted by the company two years ago has disappeared. The June report of the company shows that the decline in revenue and number of passengers carried has been cut in two.

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Expert at Work on Washington Valuation Data

Milo Roy Maltbie, retained in connection with the valuation survey of the railway lines and the bus property in Washington, D. C., has been conferring with John W. Childress, chairman of the Public Utilities Commission. Others who have attended the conference are Ralph B. Flaherty, people's counsel before the Public Utilities Commission, and Francis H. Stephens, assistant corporation counsel, who several years ago carried the valuation case of the Capital Traction Company through the local courts. The commission plans to turn over to Mr. Maltbie and his staff data and records relating to the valuation cases. Mr. Maltbie will maintain headquarters in the Senate District committee's room in the Senate Office Building. It is likely that he will prepare a preliminary report in four or five weeks for submission to Senator Capper, chairman of the Senate District Committee, by which he has been retained in connection with the proposal to consolidate the local railway and bus lines.

Railroad Boosts Railway Pass in St. Louis

The St. Louis Southwestern (Cotton Belt) Railroad in its advertising posters is telling patrons the advantages of the 25-cent Sunday pass issued by the St. Louis Public Service Company, St. Louis, Mo. Many out-of-town visitors are using the passes to "See St. Louis Safely and Savingly."

On Sunday, July 1, the first day that the new flat 8-cent fare was effective on the line of the St. Louis Public Service Company, a total of 40,851 Sunday passes was sold, an increase of 7,112 over the previous Sunday.

Another Unification Plan for New York

Original proposal by commission's special counsel modified. Municipally controlled company would issue bonds to acquire rapid transit lines now privately operated

A TENTATIVE unification plan for New York City rapid transit lines has been presented to the Transit Commission by Samuel Untermyer, its special counsel. The plan provides for the formation of a public corporation for the municipal operation of the new city system and parts or all of the Interborough Rapid Transit and the Brooklyn-Manhattan Transit rapid transit lines. The public corporation would pay for the company-owned rapid transit lines by issuance of bonds which would be somewhat similar to those of the Port of New York Authority. It would also lease company-owned lines to be acquired and the new city subway system.

ROADS UNDER PUBLIC DIRECTION

The new corporation would be controlled by nineteen directors of whom four, including the Mayor, comptroller, president of the Board of Aldermen and chairman of the Board of Transportation, would be ex-officio members. The other fifteen would be appointed by the Mayor for overlapping periods of ten years to minimize political interference. Of these latter directors a maximum of four may be nominated by the Interborough, B.-M.T., Williamsburg Company, and Manhattan Railway, depending upon how many of the latter companies come into the plan.

The public corporation would operate all lines as a unified system and the application of the pooled revenues would be in the following order of priority:

1. An amount to the city equal to the annual rental (approximately $2,655,000) being currently paid under contracts 1 and 2.
2. Taxes and rentals for miscellaneous property.
3. Operating expenses.
4. Maintenance charges to be fixed from year to year by the board of the public corporation.
5. Renewal or depreciation fund to be fixed in like manner.
6. Interest and sinking fund on the outstanding funded indebtedness of the respective companies subject to which the company-owned properties were assigned to the public corporation.
7. Interest and sinking fund on the outstanding bonds of the public corporation issued under the plan.
8. Interest and sinking fund on additional bonds of the public corporation issued for the construction or provision of additions to or betterments of additional equipment for the existing lines.
9. Additional payments into the interest fund until the initial amount shall be increased to equal two years' interest and sinking fund on the outstanding funded indebtedness of the respective companies and on the outstanding bonds of the public corporation.
10. Interest and sinking fund on the investment of the city in the properties of the city embraced in contracts 1 and 2 provided for.
11. The balance, after setting aside such portion thereof for working capital or contingency reserve as the board of directors of the public corporation may determine, to be applied to the reduction of the funded indebtedness of the respective companies until the retirement of such indebtedness in full, thereafter to the retirement of outstanding bonds of the public corporation, until such retirement thereof in full, and thereafter as the city may direct.

Accrued preferentials under existing contracts would be canceled under the Untermyer plan. On April 30, last, the Interborough claimed accrued preferentials of $2,278,925, the B.-M.T. $13,536,153, the city under contract 3 with the Interborough $86,438,867 and under contract 4 with the B.-M.T. $56,545,055.

City-owned property now under lease to the companies would presumably be paid for at the recapture price provided for under contracts 3 and 4. Payment for the company-owned properties would be made at prices to be fixed by agreement between the city and the respective companies.

In addition to the interest fund there is to be an improvement fund of $45,000,000 to be provided by the city in three annual installments of $15,000,000 each. This fund is to be used for general improvement of service.

One of the salient features of the plan is the formation of subsidiary companies of the public corporation to take over the new city lines and future lines. Such subsidiaries would have a nominal share capital and would be operated by the board of the public corporation. The purposes of this segregation into separate corporate entities with separate accounting but operated as a unified system are:

1. To permit of the release of city bonds from the debt limit on the basis of the net earnings of existing lines undiluted by the burden of interest and sinking fund payments on bond issues now being made for constructing the new lines or those that may hereafter be issued for future lines. The bonds thus released as self supporting would be made the basis of credit for further subway construction.
2. To enable the subsidiaries to borrow on their own credit a substantial proportion of their construction costs and thus create still further sources of credit based on their independent revenues, again without impairing the city's debt-incurring limit.

The boards of the various companies will probably appoint committees to negotiate with the city if the latter, through the Board of Estimate, approves of the general plan of procedure outlined.

In a report accompanying the tentative readjustment plan Mr. Untermyer recommends that the Transit Commission, with the approval of the Board of Estimate, serve notice on the Interborough and the B.-M.T. of intention to recapture the recapturable portions of those systems in event negotiations as to price between the companies and the city fail.

FORCIBLE RECAPTURE SUGGESTED

The plan contemplates the unification of the Interborough Rapid Transit Company, Manhattan Elevated, B.-M.T. elevated and subway line, Williamsburg Company and the new city system. In the event negotiations with the Interborough should fail, the Manhattan Elevated, now under lease to the Interborough Rapid Transit Company, would be eliminated from the new system which would then include, according to Mr. Untermyer's recommendations, the recapturable portions of the I.R.T. subway, the B.-M.T. subway and elevated lines, Williamsburg Company and the new city system. In case all negotiations fail Mr. Untermyer recommends that the recapturable portions of the I.R.T. and B.-M.T. be combined with the new city subway.

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Bankruptcy Law Does Not Cover Street Railway Companies

According to a decision of the Circuit Court of Appeals for the Fourth Circuit, a street railway company, certainly when it has suburban extensions, must be considered as a railroad corporation where that term is used in Section 4-a of the federal bankruptcy act. In other words, it cannot come under the provisions of that act, which, in Section 4-a, excludes "railroad corporations."

The question arose because the Columbia Railway, Gas & Electric Company of Columbia, S. C., which abandoned all railway service on March 11, 1927, petitioned to be adjudicated a voluntary bankrupt. Two years previously, or in 1925, under authority of an act of the South Carolina Legislature, it had disposed of all its gas, electric light and power property to the Broad River Power Company.

In denying this petition the Circuit Court of Appeals declared that all the trend of previous decisions was to include street railways under Section 4-a of the bankruptcy act. Two cases which appear to give a different view, In Re Grafton Gas & Electric Light Co., 253 Fed. 658, and Omaha Street Ry. Co. *vs.* Interstate Commerce Commission, 230 U. S. 324, were analyzed and differentiated from the Columbia case. On the other hand, the court quoted, as sustaining its contention, Central National Bank of Worcester *vs.* Worcester Horse Railroad Co., 95 Mass. 105-106; New England Eng. Co. *vs.* Oakwood Street Ry. Co., 75 Fed., 162; Minneapolis St. Ry. Co. *vs.* City of Minneapolis, 155 Fed., 989, 995, and other cases.

Report Favorable on Pennsylvania Electrification

The Pennsylvania Railroad states that the physical work of electrifying its main line between Philadelphia and Wilmington, started more than two years ago, and the Octoraro branch between Philadelphia and West Chester, started in April, 1927, has been progressing satisfactorily and according to schedule. As a result the company expects to start electrical operation of commuting and local trains the latter part of September, coincident with the customary change in time tables which places the fall and winter schedules in effect.

Dry Dock Fare Denied—September Hearing

The New York Transit Commission recently set for some time in September hearings on the application of the Dry Dock, East Broadway & Battery Railroad, subsidiary of the Third Avenue Railway, to put 7-cent fare schedules into effect, giving Alfred T. Davison, counsel for the Third Avenue Railway, permission to set the exact date. The commission suspended the proposed tariff to put increased fare schedules into effect July 24 pending hearings and final decision by the commission.

Ten Cents Under Injunction in Chicago

Under a temporary injunction granted on July 16 by the Federal District Court, the Chicago Rapid Transit Company established a flat 10-cent fare within the city of Chicago at midnight, July 17. The new rate represents an increase of approximately 20 per cent over the former average rate. The restraining order, issued by Federal Judges Carpenter, Page and Wham, sitting *en banc,* prevents the Illinois Commerce Commission from enforcing its recent order denying the elevated lines authority to abolish $1.25 weekly passes and its ticket rate of three rides for 25 cents.

The court overruled the objections raised by the city's representatives that the company should have carried the appeal from the commission's order to the Supreme Court before going to the federal court. In reviewing the commission's order, Judge Page remarked the statement contained therein that "it is unquestionably true that the company is not receiving the full return on its investment which the courts have decided is a reasonable return."

Inasmuch as the injunction is temporary, the company will be required to issue coupons to patrons buying tickets at the new rate of three for 30 cents and to post a bond of $50,000 with which to redeem the coupons in the event the higher fare is finally denied by the federal court. All weekly passes and tickets now outstanding are to be honored until their expiration date.

Following the issuance of the injunction, the court appointed Roswell B. Mason as special master in chancery to hear complete evidence on the rate case.

The issuance of the injunction came as a climax to proceedings instituted by the company before the Commerce Commission last February. The company based its case on a valuation fixed by the commission in 1921 at $94,000,000, including additions and extensions. On that basis, the company asserted that the existing tariffs averaged 8.3 cents per passenger carried and actually resulted in a loss of $6,000 a day by yielding a return of only 2.89 per cent on its investment.

The city opposed the application for a rate increase on the grounds that the valuation was too high, and when the commission denied the petition the company immediately took its case to the federal court, claiming that its property was being confiscated under the existing fare. Evidence of the city's intention of fighting the fare boost before the master in chancery was seen in the announcement of Corporation Counsel Samuel A. Ettleson that he will ask the City Council at once for an appropriation of $250,000 to cover the cost of an independent valuation of the elevated lines' property.

Meeting in Seattle to Discuss New Wage Schedule

In an effort to reach a tentative agreement on recommendations to be made concerning demands of organized employees of the Seattle Municipal Street Railway system, Seattle, Wash., for a new schedule of wages and working conditions for 1929, members of the utilities and finance committees of the City Council will confer with Mayor Frank Edwards. The proposed new schedule, if granted it is said, will add about $200,000 a year to the cost of operating the railway and bus system.

Wages of $150 a month during the first six months of employment, $155 a month during the next six months, and $160 a month after the first year of service are asked for motormen and conductors on two-man cars and all extra men. Seven cents an hour extra for operators of one-man cars and gripmen on the cable lines, and 10 cents an hour extra for drivers of the municipal buses, are among the requests made.

For machinists helpers and car repairmen, a flat wage of $170 a month, with a 44-hour week, is asked, and the same hours also are asked for carhouse shopmen and trackmen, together with a flat increase of $15 a month.

The schedule further asks that all men employed in the railway department be placed under civil service after 90 days of employment; that all overtime be paid for at the rate of time and a half, and that "penalty" time for all split runs be paid for at the rate of 20 cents an hour for the first hour, or fraction thereof and 10 cents an hour thereafter.

Summer Excursion Rates to Los Angeles Beaches

Marked reduction in fares to various beach resorts served by the Pacific Electric Railway, Los Angeles, Cal., have been announced. Under the reduced rates, fares to Santa Monica, Ocean Park, Venice and Palisades del Rey will be 30 cents for adults and 20 cents for children under twelve years of age. A 40-cent fare for adults and 20-cent fare for children will be effective to Long Beach, San Pedro, Seal Beach, Redondo Beach, Hermosa Beach, Manhattan Beach and El Segundo. To south-coast beaches, the saving is 30 cents a ticket and 20 cents to west-coast beach points.

Newsy Sheet in Oakland

Key System Commuter is the name of a new pamphlet 5x7 in., published on the first and third Friday of the month by the Key System Transit Company, Oakland, Cal. Vol. 1, No. 1, under date of July 6, promises "a newsy little publication that is readable and instructive." In its greetings it states, "We want to keep the *Commuter* just as stimulating and fresh as the old Bay breeze. The first issue contains some personal mention items, "ferry" tales, advice to the lovelorn, definitions of success and genius, and even a "woman's column for women."

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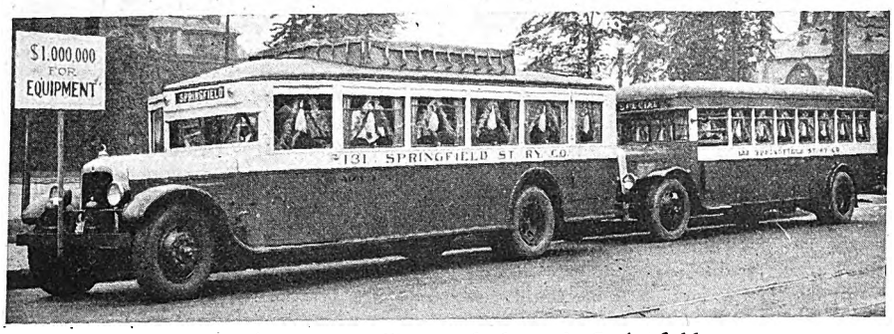
Industrial Parade Prize Won by Springfield, Mass., Road



Some of the new rolling stock shown in Springfield

Three units were entered in the industrial division of the Independence Day Parade at Springfield, Mass., by the Springfield Street Railway, which is spending $1,500,000 in rehabilitation work. Moreover, the company came off a prize winner.

The first unit was one of its new de luxe Yellow coaches used on a line where railway service has been abandoned. Only the interior of the bus was decorated.

The second unit was one of the company's new 33-passenger Z Yellow coaches which will be used in city service. This was decorated in a manner similar to the first unit.

The third unit was a truck showing the modern method of track welding. Here a 5-ton dump truck was used. The sides of the truck were removed and a platform built on it about 14 ft. long and 8 ft. wide. A section of track was mounted on this platform and on each rail were three joints. The first showed the old type channel plate joint. The second showed a welded joint under construction with all equipment on the truck necessary for making the joint. The third showed the completed joint. While the parade was in progress a full welding gang on the truck went through the same operations its members do when actually installing the welded joint. Photographer's flashlight powder placed on a plate in the crucible was touched off every few minutes during the three-mile march, making a flash similar to that in the actual welding operation.

The three units were led by an employee who carried a banner which read: "One and One-Half Million Dollars for Rehabilitation."

A second sign, attached to the de luxe bus, read: "One Million Dollars for New Equipment."

A third sign, carried on the welding display unit, read: "One-Half Million Dollars for Track Work."

Across the top of the truck was a banner which read "Modern Welded Joints Make Riding Easy."

Near the old type of joint was a sign which read "Old Method," near the new joint under construction and also the modern joint completed was a sign which read "New Method" and then a sign reading "Process" was placed near the display showing the joint under construction and another which read "Result" was placed near the completed joint.

A frame was built around the truck, both sides, front and rear and extended out 12 in. from the platform and down to 6 in. from the ground. This, as well as the truck cab, was decorated.

For this last display the railway received first prize, a hammered silver cup 18 in. high for the "Best Industrial Growth Float."

A hammered silver cup was the prize this display won

Wants Iowa Interurban Service Resumed

Petitions have been circulated in Fort Dodge and Webster City, Iowa, requesting the Iowa Railroad Commission to require the Fort Dodge, Des Moines & Southern to resume its interurban service between the two cities. A hearing has been set for Sept. 4. The company announced that adequate transportation was afforded by its two bus routes in the territory. The road is primarily a carrier of freight. The freight service between the cities has not been disturbed.

New Franchise in Dallas for Interurban

A twenty-year renewal of the franchise of the Texas Electric Railway, an interurban, to operate within the city limits of Dallas is embodied in an ordinance now before the City Commission. In the new franchise, provision is made to enable the electric railway to bring in freight cars over its lines from the south, crossing the viaduct and delivering them to its express and freight depot on Jefferson Avenue in front of Ferris Plaza. Because the line from Denison on the north traverses a large part of the residence district, the same privilege of handling freight is not permitted within the city on that division.

The Texas Electric Railway recently was authorized by the Texas Railroad Commission to handle carload and less than carload shipments of freight and in connection with steam railroads intersecting the line the interurban now has freight service between Dallas and practically all intrastate and interstate points. At the present time interurban cars are used in handling freight shipments, but the company plans to purchase several electric locomotives in the future as this new business increases.

Increases in Fares in Stockton and Sacramento

Two increases in fares were granted by the California Railroad Commission on July 11, one for Sacramento and the other for Stockton. Fares in Sacramento will go up from 5 cents to 7 cents and in Stockton from 6 to 7, with four tokens for 25 cents in both cities. The pass has been in use in Sacramento.

The commission found that the Stockton Electric Railroad and the Pacific Gas & Electric Company, owners of the Sacramento system, were not earning reasonable returns on their property and suggested certain operating economies to save approximately $45,000 annually in both places.

Commissioner William J. Carr filed a dissenting opinion. He said:

Increased fares almost invariably drive patronage away. In this critical period fare increases should be avoided if possible. Within the last year this commission has had before it applications for rate increases from nearly every electric railway in the State. As disclosed by these various applications two facts stand out in respect to the street railways. One is that generally the number of passengers carried is not increasing as population increases. The second is that horizontal fare increases or violent rate changes tend to lessen the riding habit.

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New Rates Suggested in Roanoke

A schedule of revised rates effective Aug. 15 has been filed with the State Corporation Commission by the Roanoke Railway & Electric Company, Roanoke, Va. The company would sell a $1 weekly pass, good for unlimited riding in zone one and would issue a similar $1.50 transferable pass, good on all lines. Tokens would be sold four for 25 cents, but the cash fare would be 7 cents. Round-trip fares from Roanoke to Vinton and to Salem would be fixed at 35 cents under the new schedule.

Cuban Public Utility Tax Reductions

President Machado of Cuba has sanctioned a law reducing railroads' and electric railway companies' taxes to 6 per cent from 8 per cent, and suppressing the municipal tax on public utility companies that pay taxes to the state.

Ordinance Advanced for Acquiring San Francisco Lines

The finance and public utilities committee of the Board of Supervisors of San Francisco, Cal., has approved an ordinance paving the way for acquisition by the city of the systems of the Market Street Railway and California Street Cable Railroad and their eventual consolidation with the Municipal Railway lines. The ordinance to be recommended to the entire board by the joint committee provides for: A survey by the Board of Public Works of the existing transportation system, and proposed unification of all lines. Valuation of the railroad properties by the city engineer and city attorney staffs. Opening of preliminary negotiations by the engineer and attorney for acquisition of necessary lines.

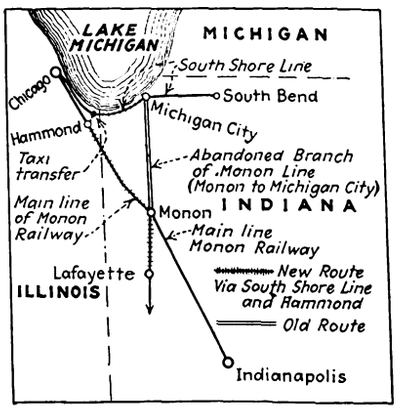
Vote for Arbitration in Toronto

Members of the union of employees of the Toronto Railway, Toronto, Ontario, have decided by a vote of 644 to 25, to require arbitration in their wage demands. At the May meeting, when the union first considered the question of whether the case should go to arbitration, 1,843 members were in attendance.

The executive officers had recommended a renewal of the existing agreement for a further period of two years. As the *Labor Leader*, Canada's National Labor Weekly, put it, they did this, no doubt, owing to the fact that the citizens of Toronto generally feel that the men have been treated fairly by the Toronto Transportation Commission, which operates the railway, and that their wages compare very favorably with any other body of men performing similar work in Canada, and again that the conditions in the labor market generally are not the best at the present time. That paper expressed the belief that the executive officers of the men had the interests of the men at heart and recommended according to their matured judgment.

Co-operation Between Steam and Electric Road in Indiana

Steam and electric railroads are co-operating in the sale of through tickets connecting Indianapolis, Monon and Lafayette, Ind., and other stations of the Chicago, Indianapolis & Louisville Railway and points on the Chicago, South Shore & South Bend Railroad by way of Hammond, Ind., into which city both lines operate. An arrangement effected with the Yellow Taxicab Company of Hammond provides for the free transportation of passengers and baggage in each direction between the local depots of the two lines, which are about ¾ mile apart.



Monon and the South Shore co-ordinate services

The new joint service facilities of the Monon and the South Shore Lines were adopted as a result of the discontinuance in May of all passenger train service between Lafayette, Monon and Michigan City on the Michigan City branch of the former road. Through the efforts of the Michigan City Chamber of Commerce, the two roads were brought together and induced to establish the through ticket arrangement. While the distance between Michigan City and Lafayette is considerably greater by way of Hammond than over the Monon Line's direct route, the difference in fare will be negligible. Four fast trains will be provided daily each way compared with the two locals formerly operated on the Monon branch. The through schedule is so adjusted that connections at Hammond can be made easily and with little waiting for passengers traveling in either direction.

Entire Council in Jacksonville to Hear Franchise Arguments

Negotiations between the City Council of Jacksonville, Fla., and the Jacksonville Traction Company looking toward the compilation of a suitable franchise are to be carried on between a committee of five from the Council, a representative of the city attorney's office and a representative of the company. Citizens interested in the franchise will participate in the sessions. Peter O. Knight, Tampa, Fla., counsel for Stone & Webster interests, suggested that the entire Council discuss the project. He declared he would rather discuss the proposed measure with a committee of Councilmen than with the committee of citizens which prepared a draft of a franchise, stating that the Councilmen were under oath and the committee members were not and were only voicing their own ideas in the matter.

Recently negotiations for a new franchise covering operation of the railway system were suspended pending further investigation of the valuation and other matters by a committee of the Council.

Another New York City Company Seeks Fare Increase

The Eighth & Ninth Avenue Railway, operating the surface lines of those avenues in New York City, filed a new tariff schedule on July 17 with the Transit Commission, fixing the fare effective Aug. 20 at 7 cents. The Transit Commission has indicated that it will refuse to approve the higher schedules.

Seattle Fare Proposal in Prospect

Proposal of a plan to lower Seattle, Wash., car fares with the idea of increasing patronage and revenues will be presented to the City Council in the near future by Councilman Lou Cohen. The plan will be to sell coupon books, giving sixteen rides for $1, with the provision that the book must be used only during the week of purchase. Mr. Cohen declares his plan has the approval of D. W. Henderson, superintendent of the Municipal Railway, and offers it in lieu of the proposal made recently by Roy Furse, Mr. Henderson's assistant, that a $5,000,000 bond issue be floated locally to build 200 new cars and extend city lines. This plan appears doomed to failure. Councilman Cohen says his proposal does not offer any solution to the new car or extension problem, but would improve revenues to a great extent. Tokens would still be procurable at three for a quarter for those not wanting books.

Increased Fare Rates in Rome

Permission was given the Georgia Power Company by the Georgia Public Service Commission recently to increase its railway rates in Rome, Ga., to 8 cents for a single fare and two tickets for 15 cents. School children can buy twenty tickets for 80 cents. This is an increase of 1 cent. Transfer regulations remain the same. The new schedule of rates is effective immediately. The former rate was 6 cents.

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Recent Bus Developments

Transfer in Binghamton Approved

The Public Service Commission consented on July 17 to the transfer to the Binghamton Railway Bus Lines, Inc., Binghamton, N. Y., of certificates for the operation of the Triple Cities Bus Lines in Endicott and connecting Binghamton and Endicott and Vestal. The Binghamton Railway Bus Lines is a subsidiary of the Binghamton Railway, and under this order officials of the latter will adjust the bus service with that on the railway lines and transfers will be given between the buses and cars.

Three certificates covering the operation of the bus lines in Endicott and between Binghamton and Endicott and Vestal were originally granted to Edward J. Dorey and later transferred to the Triple Cities Bus Lines. Since 1925, with the approval of the commission, the Binghamton Railway Bus Lines has operated the three bus lines under a lease and recently a contract for the sale of the physical property to the railway bus lines was approved by the United States District Court.

Authorized to Put Buses on Decatur Line

The Illinois Power & Light Corporation's petition to the Decatur, Ill., City Council for permission to remove tracks on its Riverside line in Decatur and substitute bus service has been granted. The city also waived its right, under the franchise grant of 1925, to require the railway to replace its tracks, if, after trial, the bus service proves unsatisfactory.

Would Substitute Buses on Division in Trenton

The Trenton & Mercer County Traction Corporation, Trenton, N. J., has petitioned the Trenton City Commission for permission to substitute buses for cars on the Market and South Warren Streets division.

Franchises in Albany Arouse Opposition

Action by the Albany, N. Y., Common Council on ordinances authorizing two additional bus routes to be operated by the Albany Transit Company in newly developed residential sections has been deferred until Aug. 21. At a public hearing held July 16, opposition developed to the granting of the franchises, both from residents of some of the territory sought to be served and from the Capitol District Transportation Company, a subsidiary of the United Traction Company.

The new routes proposed would deflect a certain amount of patronage from the United Traction Company and its subsidiary bus company which has evinced a willingness to give service over substantially the same routes as that proposed by R. B. Hayes, manager of the Albany Transit Company.

Co-ordination in Cincinnati

City manager says it is desirable but that no disposition exists to hurt present operators

THE proposition of unified transportation in Cincinnati, Ohio, is discussed in a letter sent to City Manager Sherrill, by Thomas L. Tallentire, representing the City Transit Company, operators of a number of bus lines. The letter says in part:

You emphasize the importance of a unified transportation system and predict that this soon will be a reality. While independent bus operation, highly competitive and adverse to the existing street car system, with its bus operation, might be quite undesirable or even detrimental to the interest of the public, this cannot be said of our operations, for the reason that we have studiously avoided any spirit of antagonism or hostile competition. This company has at all times endeavored to provide a service that was not provided by any other agency.

We believe that our company should be given some credit for our endeavors, and I am fearful that your expression of opinion with reference to the desirability of unified operation will tend to affect our system unfavorably. Having previously expressed a desire to co-operate with the city in every way, it appears to us that the investment in both time and money in the present city transit system deserves fair consideration from the city administration.

We believe the continuance of an independent transportation system in this city accompanied with a general co-operative spirit would be beneficial to the city; also that it is debatable whether unification would offer more advantage to the public.

In reply Mr. Sherrill said in part:

My suggestions concerning the consolidation of bus operation were based on the experience of most of the cities of the country, that a well-regulated unified system of transportation is much better for the community as a whole than a number of loosely regulated or unregulated competing lines of systems. This has been recommended by the Beeler organization as one of the conditions precedent to the completion of the rapid transit line, and generally agreed to by engineers who have made studies and surveys of these questions in various cities.

In Cincinnati, where the city has such complete control of the railway system, and where that system can be required to furnish any necessary transportation to any community, it would be especially desirable to have a unification of transportation facilities.

While I believe in the unified transportation system for every city as the best method of providing transportation for the public at large at the minimum cost, and with the best regulation, I still would not suggest any action which would be detrimental to the interest of the various operators of buses or taxicabs. In any legislation that might be suggested by me to the City Council the rights of these operators would be carefully protected. The improvement suggested is one that might be necessary to extend over a period of many years for accomplishment, but it should undoubtedly be ultimately secured.

It seems to me, in view, of your letter, that it might be desirable for the independent bus operators to consider a more equitable disposition of the cost of serving certain sections of the city, and I would suggest that steps might well be taken by the various bus operators to undertake a consideration of these matters in the spirit of co-operation with the city. If a conference could be arranged with all those interested to discuss plans co-ordinating with this service, without any change at present in the existing methods, I feel sure that much good can be accomplished.

This correspondence antedated the unification arrangements to which reference was made in the JOURNAL for June 30, 1928, page 1088.

New Service in St. Louis Started

The St. Louis Public Service Company established bus service into the district lying between West Florissant Avenue and Broadway in the extreme northwest section of St. Louis, Mo., on June 23.

Substitution Likely on Sodus Bay Line

An application for permission to abandon the Sodus Bay line of the New York State Railways has been made by attorneys for the company, in behalf of James Hamilton, president. The stockholders have approved the abandonment of the road. It is said that bus service may be substituted for the interurban cars.

Would Supplant Railway Line in Massachusetts

The Springfield Street Railway purposes to discontinue its railway line on the so-called Birchen Bend route from Chicopee Falls to Indian Orchard, Mass., and substitute a bus service. The company has informed the public officials that the car line is losing money. The bus service would be on an hourly basis.

Extension in Los Angeles

The Los Angeles Railway and the Pacific Electric Railway, operating under the name of Los Angeles Motor Coach Company, have been granted a certificate by the California Railroad Commission to extend the Sunset Boulevard line in the Los Angeles downtown district. Applicants have also been authorized to increase the fares on this line from 10 cents to 15 cents one way and 25 cents round trip between points west of Sunset Boulevard and La Brea Avenue and east of First Street and Vermont Avenue, within twenty days from July 9, 1928.

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Financial *and* Corporate

Net Income in Allentown $520,047

The transportation business of the Lehigh Valley Transit Company, Allentown, Pa., continues to decline. The decline in revenue has, however, been retarded somewhat by the rearrangement of car schedules, the application on Oct 9 of increased fares, the adoption of the weekly pass, together with other modifications of former methods which appear to be helpful. The net income for the year ended Dec. 31, 1927, was $520,047, compared to $480,413 for the year ended Dec. 31, 1926. The company's former financial policy and its standard of physical fitness have been maintained. These facts were brought out by P. B. Sawyer, president, in his annual report.

CONSOLIDATED INCOME ACCOUNT OF THE LEHIGH VALLEY TRANSIT COMPANY AND SUBSIDIARY COMPANIES—YEARS ENDING DEC. 31

	1927	1926
Total gross earnings	$4,590,261	$4,950,443
Total operating expenses including taxes	3,367,094	3,710,217
Net earnings from operation	$1,223,166	$1,240,226
Income from interest on bonds	1,067	977
Income from interest on notes and deposits	18,790	28,025
Income from dividends on stocks	109,075	110,075
Total net earnings	$1,352,100	$1,379,303
Depreciation allowance	$243,841	$277,712
Interest—funded debt	567,675	599,585
Amortization of discount and expenses	20,535	21,593
	$832,053	$898,890
Net income	$520,047	$480,413

New bus routes have been established on the lines of the Easton Transit Company to Glendon and West Easton and in the Lehigh Valley Transit territory from Allentown to Nazareth via Bath, making a total of twenty buses now operated over six routes. The bus subsidiary is the Lehigh Valley Transportation Company. In its railway service the company is now operating 281 passenger, freight, and work cars over 202.86 miles of track.

During the year the Wales Junction-Chestnut Hill abandonment has been written off and the depreciation reserve has been reimbursed for the amount written against it to the extent of $500,000 out of net income.

$1,205,104 Available in Los Angeles for Dividends and Surplus

The Los Angeles Railway, Los Angeles, Cal., reports to the Railroad Commission its 1927 operating revenue at $13,287,600, compared with $13,021,482 for 1926. Operating expenses, excluding taxes for 1927, are $11,062,012 and $10,930,998 for 1926, leaving a net operating revenue of $2,225,587 for 1927, and $2,090,483 for 1926. During 1927 taxes charged to operation amounted to $814,347 and for 1926 to $807,925. Deducting the taxes leaves operating income of $1,411,240 and $1,282,558 for 1926. Adding to the operating income, the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income of $1,205,104 for 1927, and $1,080,895 for the year previous.

Stone Mountain Hearing Postponed

Hearing before the Georgia Public Service Commission on the petition of the Georgia Power Company to discontinue service on the Stone Mountain line between Atlanta and Decatur has been postponed from July 24 to July 31. If the request of the company is granted, passengers on the Stone Mountain interurban will transfer in Decatur to cars going into Atlanta, and that part of the line which is now operated between Decatur and Atlanta will be discontinued. Lack of traffic on the division lying between Atlanta and Decatur is given by the company as the reason for requesting the change.

$82,811 Earned by Boston "L"

Public trustees report for year ended June 30, 1928. Commonwealth to receive $895,518 on account of deficit of $3,980,151

THE board of public trustees of the Boston Elevated Railway, Boston, Mass., is about to repay to the commonwealth $895,518 on account of the deficit of $3,980,151 incurred in the first year of public operation. The balance still due to the cities and towns which were assessed to meet this deficit in 1919 is $1,349,333.

The greater part of this payment of $895,518 comes from earnings of earlier years, the actual surplus of receipts over cost of service for the current year ending June 30, 1928, being $82,811.

The amount now available for repayment from earnings of previous years includes among other items approximately $250,000 reserved for taxes, which is no longer required; $400,000 dividend received from the Transit Mutual Insurance Company as well as $146,000 arising out of the adjustment of depreciation because of the change in the estimated service life of buses.

In 1921 the Transit Mutual Insurance Company was organized to carry the Workmen's Compensation Insurance of the railway. The operation of this insurance company has produced substantial savings, and it was felt that in order to provide adequate protection for injured employees and their families no

RECEIPTS AND COST OF SERVICE OF THE BOSTON ELEVATED RAILWAY FOR TWELVE MONTHS ENDED JUNE 30

	1928	1927
Receipts		
From fares	$33,728,232	$34,392,884
From operation of special cars, mail pouch service, express and service cars	44,036	38,184
From advertising in cars, on transfers, privileges at stations, etc	774,243	771,070
From other railway companies for their use of tracks and facilities	111,157	85,954
From rent of buildings and other property	58,820	76,765
From sale of power and other revenue	196,054	149,664
Total receipts from direct operation of the road	$34,909,542	$35,514,521
Interest on deposits, income from securities, etc	100,391	103,545
Total receipts	$35,009,933	$35,618,066
Cost of Service		
Maintaining track, line equipment and buildings	$3,682,909	$3,944,597
Maintaining cars, shop equipment, etc	4,338,827	4,476,083
Power	2,526,319	2,607,346
Transportation expenses (including wages of car service men)	11,401,558	11,706,990
Salaries and expenses of general officers	92,375	92,608
Law expenses, injuries and damages, and insurance	1,673,009	1,677,503
Other general operating expenses	1,368,397	1,329,804
Federal, state and municipal tax accruals	1,793,128	1,902,525
Rent for leased roads	3,149,857	3,155,110
Subway and tunnel rentals to be paid to the city of Boston	1,869,158	1,817,200
Cambridge subway rental to be paid to the commonwealth of Mass	400,039	400,935
Interest on bonds and notes	2,553,097	2,515,714
Miscellaneous items	78,448	68,249
Total cost of service	$34,927,122	$35,694,665
Excess of receipts over cost of service	$82,811	.....
Excess of cost of service over receipts	.....	76,599
Credit for adjustment in depreciation charge a/c of change in estimated life of buses	146,206	
Net gain	$229,017	
Revenue Passengers Carried		
10-cent passengers	296,668,945	304,358,313
6-cent passengers	833,941	59,435,988
5-cent passengers	8,511,285	8,099,274
6¼-cent passengers	57,562,394	.....
Total revenue passengers carried	$363,576,565	$371,893,575
Total receipts per revenue passenger, cents	9.629	9.577
Receipts from fares per revenue passenger, cents	9.281	9.252
Cost of service per revenue passenger, cents	9.606	9.598
Total payroll included in operating expenses	$16,826,418	$17,108,189
Payroll cost per revenue passenger, cents	4.628	4.600
Tons of coal consumed	222,864	228,911
Cost of coal consumed	$1,094,966	$1,133,423
Average cost of coal consumed, per ton	$4.91	$4.95

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dividends should be declared until the company had been in business for a sufficient period of time to obtain real experience with reference to the ratio of losses to premiums.

The depreciation upon buses had been computed since the beginning of this type of operation on the basis of an estimated service life of five years. The first buses purchased have already reached that age and are still in service, consequently for the purpose of providing for depreciation the estimated life has been increased to six years with reference to buses purchased prior to Jan. 1, 1928, and has been fixed at seven years upon the later and improved type of buses purchased since Jan. 1, 1928, and the depreciation charge upon all buses owned readjusted accordingly.

This repayment of $895,518 will be distributed by the commonwealth to the municipalities substantially as follows: Boston, $648,446; Cambridge, $87,514; Somerville, $37,843; Brookline, $23,015; Medford, $18,447; Malden, $17,238; Everett, $16,924; Watertown, $12,719; Arlington, $10,026; Chelsea, $9,155; Newton, $8,398; Belmont, $5,787.

For the twelve months ended June 30, 1928, the average receipts per revenue passenger on the Boston Elevated Railway were 9.629 cents. Cost of service was 9.606 cents per revenue passenger, divided as follows: labor, 4.628 cents; interest on bonds and notes, 0.702 cents; rent on subways and tunnels, 0.624 cents; rent of leased roads 0.866 cents; coal, 0.301 cents; depreciation, 0.774 cents; damages, 0.328 cents; material and other items, 0.890 cents; taxes 0.493 cents.

Indiana Deal Nearing Completion

Final steps under way by which Terre Haute, Indianapolis & Eastern and subsidiaries will be merged with Central Indiana Power as Central Indiana Power Corporation

STOCKHOLDERS of the Terre Haute, Indianapolis & Eastern Traction Company will meet at Indianapolis, Ind., on Aug. 1 to consider plans for the proposed merger of the company's properties with the Central Indiana Power Company, an Insull concern. This meeting served to focus attention again on a deal that has been pending for many months and attended with many vicissitudes for the interests which have been seeking to bring to a workable basis the divergent views of those that would be affected. Only a few weeks ago Halsey, Stuart & Company, New York, readjustment managers, filed an amended plan and agreement. The plan, in short, provides for the readjustment of securities, consolidating the Central Indiana Power Company and subsidiaries and the Terre Haute, Indianapolis & Eastern Traction Company and certain subsidiaries into the Indiana Electric Corporation. Here are the terms for the exchange of securities as modified:

(1) In lieu of Indiana Central Rapid Transit Company first mortgage 5 per cent bonds, the holders of Indianapolis & Northwestern Traction Company first mortgage 5 per cent bonds and the holders of Indianapolis & Martinsville Rapid Transit Company first mortgage 5 per cent bonds and the holders of Indianapolis Crawfordsville & Danville Electric Ry. first mortgage 5 per cent bonds are to be entitled to receive preferred stock, series A, of Indiana Electric Corporation, exchangeable on the basis of one share of stock for each $100 of bonds.

(2) In lieu of 5 per cent cumulative preferred stock of Indiana Central Rapid Transit Company, holders of Indianapolis & Northwestern Traction Company 5 per cent cumulative preferred stock and holders of Indianapolis Crawfordsville & Danville Electric Railway 5 per cent cumulative preferred stock are to be entitled to receive preferred stock, series B, of Indiana Electric Corporation, exchangeable par for par.

(3) In lieu of an equal par amount of Indiana Electric Corporation participating adjustment preferred stock, the holder of each share of Terre Haute, Indianapolis & Eastern Traction Company 5 per cent cumulative preferred stock shall be entitled to receive three-quarters of a share of Indiana Electric Corporation adjustment preferred stock.

(4) In lieu of one share of Indiana Electric Corporation participating adjustment preferred stock for each 10 shares of Terre Haute, Indianapolis & Eastern Traction Company common stock, holders of such common stock are to be entitled to receive Indiana Electric Corporation adjustment preferred stock exchangeable on a basis of three-quarters of a share of adjustment preferred stock for each 10 shares of common stock.

Here is the description of the new preferred stock of the Indiana Electric Corporation:

Series A.—This stock will have a par value of $100 per share. It will be entitled to receive after paying or setting aside for payment the dividends on all stock of senior rank, cumulative dividends, payable quarterly at the following rates, viz.:

For 1929 and 1930, 2 per cent per annum; for 1931 and 1932, 3 per cent per annum; for 1933 and 1934, 4 per cent per annum; for 1935 and thereafter, 5 per cent per annum. This dividend schedule is based upon completion of consolidation as of Dec. 31, 1928.

Series B.—This stock will have a par value of $100 per share. It will be entitled to receive after paying or setting aside for payment the dividends on all stock of senior rank, cumulative dividends, payable quarterly at the following rates, viz.: For 1929 and 1930, 1 per cent per annum; for 1931 and 1932, 2 per annum; for 1933 and 1934, 3 per cent per annum; for 1935 and 1936, 4 per cent per annum; for 1937 and thereafter, 5 per cent per annum. This dividend schedule is based upon completion of consolidation as of Dec. 31, 1928.

Series A and series B of the preferred stock is to have equal rank in all other respects and be preferred as to dividends and assets at par over the adjustment preferred stock and common stock of the Indiana Electric Corporation. It will not be entitled to participate in subscriptions for any additional shares of stock of whatever class thereafter issued, and will be subject to redemption at the option of the company at any time at $100 per share. In the event the quarterly dividend is not paid in full for four dividend periods, then the holders of stock on which dividends shall not have been paid together with the holders of other shares then voting, have full voting rights, each share thereof being entitled to one vote. Such voting rights of preferred stock and each series thereof shall continue until dividend payments have been resumed. Series A and series B of preferred stock will be subject in all respects to the preferences and priorities of such other classes of preferred stock, except the adjustment preferred stock, as may now or hereafter from time to time be authorized.

The adjustment preferred stock of the Indiana Electric Corporation has been described in part as follows:

This stock will have a par value of $100 per share. It will be entitled to receive in or for any year out of the company's net earnings during such year available for the payment of dividends after paying or setting aside for payment the preferred dividends on all stock of senior rank, noncumulative dividends, payable quarterly at the following rates, viz.: For 1930 and 1931, 1 per cent per annum; for 1932, 2 per cent per annum; for 1933, 3 per cent per annum; for 1934, 4 per cent per annum; for 1935, 5 per cent per annum; for 1936 and thereafter, 6 per cent per annum. No dividends are to be paid in or for the first full year of operation, which, for the purposes of the foregoing schedule is assumed to be the year 1929. No dividends are to be declared or paid in or for any year upon the common stock unless or until dividends at the foregoing rates shall have been declared and paid or set apart for payment upon the adjustment preferred stock. The adjustment preferred stock will be subject to redemption at the option of the company at any time at $100 per share. In the event that quarterly dividends in accordance with the schedule of rates above stated shall not be paid in full for four consecutive dividend periods, then the holders of the adjustment preferred stock shall, together with other shares then voting, have full voting rights, each share thereof being entitled to one vote. Such voting rights of the adjustment preferred stock shall continue until dividend payments have been resumed as required by the foregoing provisions.

The common stock of the Indianapolis & Northwestern Traction Company, Indianapolis & Martinsville Rapid Transit Company and the Indianapolis Crawfordsville & Danville Electric Railway are to be exchangeable under the provisions of the plan for the common stock of the Indiana Central Rapid Transit Company if and when such a corporation is formed. If it should be deemed desirable and advantageous by the manager to change this provision of the plan and not create the Indiana Central Rapid Transit Company, or to create it and not merge any of the three companies above named into it, then the common stocks of the three companies are to remain as now the property of the Terre Haute, Indianapolis & Eastern Traction Company and pass to the Indiana Electric Corporation upon merger.

The preferred stock, series A and B, is

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a new provision of the plan not heretofore been set forth in the plan and agreement. The provisions as to the adjustment preferred stock are in lieu of all provisions relative to the stock described as participating adjustment preferred stock in the plan.

It is the judgment of the readjustment manager that the other securities of senior rank included in the plan and agreement, dated July 1, 1927, are not adversely affected by the amendment thereto hereby made.

Mississippi Interurban Would Abandon Service

Efforts by the Mississippi Power Company to discontinue interurban service between Laurel and Ellisville, Miss., have resulted in an order by the Ellisville Mayor and commissioners for a general election on Aug. 14, at which qualified voters will be asked to decide whether the company franchise will be cancelled. The line is 7 miles in length.

The two towns connected are about 30 miles north of Hattiesburg. If the Ellisville citizens agree to the abandonment the company expects to ask Laurel to hold a similar election. The company says the line is not self-supporting.

Another Move in Indianapolis & Cincinnati Reorganization

Hearings have been held by the Public Service Commission of Indiana on petitions for authority for the Southeastern Indiana Power Company and the Indianapolis & Southeastern Railroad to purchase the power property formerly owned by the Indianapolis & Cincinnati Traction Company, asking approval of the purchase by the Southeastern Indiana Power Company of the power property of the Indianapolis & Cincinnati Power & Light Company, and asking authority for the Southeastern Indiana Power Company to issue $600,000 in bonds, $400,000 in preferred stock and $200,000 in common stock to finance the transaction.

The applications are all made in connection with the plan to segregate the light and power business of the old Indianapolis & Cincinnati Traction Company from the railway and are in accordance with the plan of the new owners who bought in the system at foreclosure and have it in mind to conduct the railway under the corporate title of the Indianapolis & Southeastern Railroad and the power property under the corporate title of the Southeastern Indiana Power Company.

Olean Equipment for Sale

Equipment formerly owned by the Olean, Bradford & Salamanca Railway, Olean, N. Y., now being dismantled, is offered for sale. Inspection of material may be made on the ground at any time after July 24. Besides a number of cars and car equipment, material on hand includes substations, electrical and track equipment and miscellaneous pieces. M. B. Serfas of Olean and Hazleton, Pa., is dismantling the road.

Southern Pacific After Visalia

The Interstate Commerce Commission has been asked to authorize the Southern Pacific to acquire control by lease of the Visalia Electric Railroad, Robertson Boulevard, Chowchilla, to Dairyland Farms subdivision, a distance of 10.2 miles, and certain rights-of-way. The total mileage operated by the Visalia is 72.29 miles standard gage. The road does not parallel and is not competitive with the Southern Pacific.

The Visalia Electric Railroad, operating in Exeter, Visalia and vicinity, reports to the California Railroad Commission its 1927 operating revenue at $181,998 compared with $188,941 for 1926. Operating expenses, excluding taxes for 1927, are $108,323 and $95,386 for 1926, leaving a net operating revenue of $73,675 for 1927, and $93,554 for 1926. During 1927 taxes charged to operation amounted to $13,950 and for 1926 to $15,064. Deducting the taxes leaves operating income of $59,724 for 1927, and $78,490 for 1926. Adding to the operating income, the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income, (which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus), of $60,338 for 1927 compared with $79,487 in 1926.

Would Discontinue Illinois Line

The Illinois Power & Light Corporation has filed a petition seeking authority to discontinue interurban service between Ottawa and Streator, Ill. It is the claim of the petitioners that since the hard road was opened the interurban service is operated at a daily actual loss. The railway may continue the Streator branch as a freight line.

Maturity of Pittsfield Bonds Extended

Bonds of the Pittsfield Electric Street Railway, the payment of which were assumed by the Berkshire Street Railway in 1910 in connection with the purchase of the Pittsfield Company property, became due on July 1 of this year. They have a face value of $300,000. The maturity of these bonds has been extended for a period of ten years by an agreement which has just been approved by the Massachusetts Department of Public Utilities. The rate of interest is reduced from 7 to 6 per cent.

Municipal Road in Massachusetts to Quit

The municipally-owned Norton, Taunton, Attleboro & Mansfield Street Railway, operating in Massachusetts, is due to cease operation on July 22.

Directors of the controlling corporation, who are the Mayors of Taunton and Attleboro, and the chairmen of Selectmen of Norton and Mansfield, met on July 13 and took the formal steps to bring about the end of the road. Bus service has been arranged by all of the communities.

Attleboro will get service from the Interstate Street Railway by bus from Monument Square to the Attleboro-Norton line. There the passengers will have to change since Norton officials failed to give the Interstate Company the right to go into the town.

The Foxboro-Mansfield Bus Company has been authorized by Norton to go to the Attleboro line and also to come into the town from Mansfield. The Eastern Massachusetts Company of Taunton has the right to operate from that city to Norton.

The road was taken over about five years ago from the private owners by the municipalities served and has since been run under a pooling arrangement among the communities served.

Illinois Line to Be Sold

The Illinois Central Electric Railway, operating 26 miles of single track, will be sold at public auction at its headquarters in South Main Street, Canton, Ill., on July 25 by W. H. Fouts of Lewistown, Ill., master in chancery for the Fulton County Circuit Court. The First National Bank, Canton, Ill., as trustee under a bond issue, is foreclosing on the railway's property.

Des Moines Sale Declared Certain

Sale of the Des Moines City Railway, Des Moines, Ia., under receivership, became a certainty when the receivers failed to tender to the clerk of the United States District Court $1,800,000 to retire the outstanding indebtedness of the company, as required under a decree. The sale probably will not be made until Sept. 1, due to the fact that a notice must be published.

Eleven Mile Suspension in Pennsylvania

Permission to abandon service on 11 miles of line has been granted to the Northwestern Electric Service Company by the Pennsylvania Public Service Commission. The company operates an electric railway from Erie through Meadville and Harmonsburg to Exposition Park on Conneaut Lake. The portion of the line on which it is intended to suspend service is between Meadville and the park.

The Meadville-Exposition Park section was considered separately because the State Highway Department proposes to improve a portion of the line between those points. Relocation and reconstruction of the company's tracks would approximate $52,437. On the section to be abandoned total revenue in the year ending May 31, 1928, was $18,140 and expenses were $26,488.

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Personal Items

H. H. Bailey's Duties in Tennessee Broadened

H. H. Bailey has recently been appointed superintendent of production of the Tennessee Electric Power Company, with headquarters in Chattanooga, Tenn. For the past several years Mr. Bailey has been superintendent of production of the Nashville Railway & Light Company, a subsidiary of the Tennessee Electric Power Company. In his new position he will still maintain supervision over the power plant of that company, which is operated as a part of the Tennessee Electric Power Company's system.

Mr. Bailey is a graduate of Ohio State University, and has had a number of years' experience in power plant designing, construction and operation. At the time of his transfer from Nashville, he was president of the Engineering Association of Nashville. He is a member of the Tennessee State Board of Architectural and Engineering Examiners, associate member of the American Society of Mechanical Engineers and of the American Institute of Electrical Engineers.

William Stewart Advanced at Omaha

William Stewart, private secretary to J. N. Shannahan, president of the Omaha & Council Bluffs Street Railway, Omaha, Neb., has been elected to the position of assistant secretary and assistant treasurer of the company. This promotion became effective on June 26, 1928. Mr. Stewart has been in the railway field since 1899 when he became identified with the New York Central & Hudson River Railroad at Albany, N. Y. Since that time, as told in ELECTRIC RAILWAY JOURNAL issue of Feb. 11, 1928, he has been associated with several railway companies, holding the positions of secretary, purchasing agent and treasurer.

F. D. Comerford Elected in Providence

Frank D. Comerford, Boston, president of the New England Power Association, was elected president of the Rhode Island Public Service Company on July 12 at Providence. The Service Company controls the United Electric Railways and the Narragansett Electric Company. As indicated in ELECTRIC RAILWAY JOURNAL issue of June 30 Mr. Comerford's election was expected. He succeeds Luke C. Bradley, who resigned recently to accept a position with the Electric Bond & Share Company of New York.

At a meeting of the directors of the United Electric Railways on July 12, Mr. Bradley handed in his resignation from the board. Louis C. Gerry was elected to the position. Mr. Bradley also resigned as vice-president of the company, but no one was elected to fill the vacancy.

A. S. McArthur Made General Superintendent at Toronto

No better criterion is afforded of the increased responsibilities of A. S. McArthur with the Toronto Transportation Commission than the accompanying revised organization chart showing how the duties are divided among the officials responsible for the conduct of the railway and the buses of the municipal enterprise at Toronto, Canada. Mr. McArthur is now functioning as general superintendent of the commission, reporting to D. W. Harvey, the general manager.

A. S. McArthur

To the post he now holds Mr. McArthur was appointed on June 15 last. For three years before that, 1925-1928, he was superintendent of the garage department of the commission. Prior to that he was for two years, 1924-1925, assistant superintendent of the bus department of the commission, responsible for co-ordinated service on a scale probably larger than that of any other comparable community.

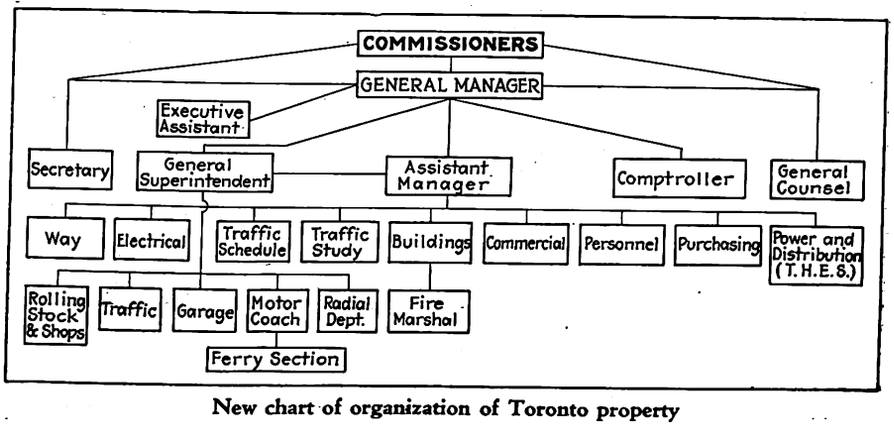
These, of course, are facts, but they shed very little light on the work of the man himself or his fitness for the post he now holds. It was his record in these posts, however, that led to his selection as general superintendent, for the titles he formerly held do not adequately indicate the extent of the work he did or contain a clue to the quality of the service he rendered in these positions. To his new position Mr. McArthur brings the technical qualifications of the engineer, reinforced by a wide experience in management. Part of this he obtained in directing, on his own account, following his service with the Canadian forces in the World War, a large farm to which he applied modern methods with men and machinery. Having done this, the urge to return to a field more nearly akin to his technical qualifications became irresistable. It was then he returned to the Toronto commission, the predecessor of which he had served from 1912 to 1914 as resident engineer of the Toronto Civic Railway, the lines of which were merged with those of the Toronto Railway when that private enterprise was taken over by the city.

Mr. McArthur was born on June 4, 1888, at Quebec. He attended Model School, Upper Canada College, and was graduated from the University of Toronto in 1911 with the degree of B.A.Sc. From the time of his graduation until 1913 he served as a dominion land surveyor.

S. Ray Shelby Renamed Commissioner

Sidney Ray Shelby has been reappointed a member of the Pennsylvania Public Service Commission by Governor Fisher. The term is for ten years from July 1, subject to confirmation by the state Senate next winter.

Mr. Shelby was first appointed a commissioner by former Governor Sproul on Feb. 11, 1919, to fill an unexpired term of ten years. He was ranking member of the commission and during the absence of Chairman William D. B. Ainey was acting chairman. With the exception of the period in 1925, when Governor Pinchot attempted to displace Mr. Shelby and James S. Benn, he has held office in the commission continuously since his orig-



New chart of organization of Toronto property

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inal appointment. The re-appointee came into the limelight with Commissioner Benn in 1925 when Governor Pinchot centered on them the blame for a ruling to which he took exception. Messrs. Benn and Shelby refused to recognize the dismissal by the Governor and carried their case to the Supreme Court, which reseated them in a decision which held that the Senate was the sole appointing power.

Appointments Made to Harbor Belt Line Railroad

George F. Squires, formerly assistant freight traffic manager of the Pacific Electric Railway, was unanimously chosen general manager of the Harbor Belt Line Railroad, Los Angeles, Cal., by the board of control, and his appointment has been approved by the board of operation. Mr. Squires is 35 years of age and has been engaged in railroad work for the past twenty years, covering practically every department.

James W. Mee, formerly general agent for the Pacific Electric Railway at Los Angeles harbor, was appointed joint terminal agent and assistant to general manager.

C. B. Nelson, formerly special accountant for the Southern Pacific Company at San Francisco, was appointed auditor.

G. C. Beaumont, formerly assistant chief engineer of the Los Angeles & Salt Lake Railroad of the Union Pacific system, has been selected as terminal engineer.

B. M. Billhardt, formerly with the auditing department of the Pacific Electric Railway, was appointed treasurer.

On May 1, Mr. Squires began the preliminary work in the formation of an organization which will unify into one consolidated operating agency the railroad facilities of the city of Los Angeles, Southern Pacific Company, Los Angeles & Salt Lake Railroad and the Pacific Electric Railway at Los Angeles Harbor, Cal. Control of this road is vested in a board of control and a board of operation composed of representatives of the aforementioned organizations.

Obituary

E. B. Katté

Edwin Britton Katté, chief engineer of electric traction for the New York Central, prominently identified with the development of electricity in heavy railroad work in the United States, died on July 19 after an illness of more than a year. He was in his 58th year.

Mr. Katté had been in active charge of electrification at the New York terminal since that work was begun and so had a great deal to do with the design of the equipment. As an expert on the electrification of terminals he was called into consultation for the Detroit Tunnel and for terminals at Cleveland and Chicago. For several years he was consulting electrical engineer of the Cleveland Union Terminals Company.

Manufactures *and the* Markets

Detroit Track Improvements May Reach $1,500,000

Detroit Department of Street Railways, Detroit, Mich., has under way an improvement program estimated to cost between $900,000 and $1,000,000, all of which will have to be paid for by the department out of earnings, since the proposal that the D.S.R. be relieved of the expense of paving between tracks was voted down by the electors of the city. This total estimated amount may be augmented by a loan of $500,000 from the city of Detroit if a plan providing for the loan, which has been under discussion, is approved by the City Council and the Street Railway Commission. In event the plan is approved, it is proposed to use the additional money to finance laying new tracks on Grand River Avenue between Meyers Road and Redford Street, and for paving between tracks.

The existing tracks on Grand River Avenue between Meyers Road and Redford Street are owned by the Detroit United Railway and are now being rented by the city at an annual cost of $76,000. There is no pavement between tracks or on either immediate side, which results in a loss of approximately 30 per cent of the road width, and this fact, together with the condition of the tracks, are cited as making the improvement necessary. The present tracks will revert to the city with the expiration of the D.U.R. franchise next month.

It is proposed, should the Council loan the D.S.R. the half million dollars, to get the work under way without delay on the 10 miles of new tracks and the paving between rails. The $76,000 now being paid to the D.U.R as rental would be applied to repaying the city and it is estimated that the D.S.R. would benefit by reduced operating costs and savings to the rolling stock equipment.

General Electric Bookings Larger

Operations of General Electric Company in the second quarter of this year ran slightly ahead of those in the previous three months and in the corresponding period of 1927. Earnings, in consequence, for the first half of the year probably will show a small improvement over the first six months of last year when net income of $23,830,162 after all charges, including depreciation and federal taxes, was equivalent to $3.12 a share on 7,211,481 no-par common shares outstanding, after allowance for dividends on special stock.

First quarter bookings totaled $79,925,840, an increase of 3 per cent over the corresponding period in 1927, and 4 per cent over the quarter ended Dec. 31, 1927, when bookings amounted to $76,708,532. Billings were about 1 per cent smaller than in the three months ended March 31, 1927, and totaled $71,640,790, while net income of $11,905,487 to March 31, after charges, this year showed a small gain.

The enhancement in net income, in the face of smaller billings in the first quarter this year against the corresponding three months of 1927, resulted principally from greater "other income" rather than from further economies in operations.

$900,000 Dallas Improvement Plan Adopted by City

A program of extensions, improvements and betterments to cost approximately $900,000 during the next three years has been proposed to the Dallas Railway & Terminal Company by the Mayor and Board of Commissioners. John W. Everman, supervisor of public utilities, prepared the report which was adopted by the city officials. The items in the Everman plan No. 4 heretofore agreed upon and not completed are:

Extend Junius Heights line, Ridgeway to Llano	$56,093
Rebuild Collett Avenue, Columbia to Gaston	25,405
Install negative return feeder to serve North Dallas substation	895
Reconstruct and repave Commerce Street, H. & T. C. to Exposition	16,095
Install underground cables on Willow Street, East Dallas substation to Pacific Avenue	6,145
Purchase one new bus, two new chassis and rebuild two bus bodies	4,560
Track rearrangement at Fair Park, removing Parry Avenue tracks and replacing same to Fair Ground property	25,860
Total	$135,045

New work to be included in Everman plan No. 5 is given in the following:

Purchase seventeen new Peter Witt cars	$245,480
Rebuild and convert fourteen cars to one-man operation	21,000
Cole Avenue, double track and pave	109,795
Vickery line—purchase same, double track and pave McMillan	66,065
Peak, Ross to Munger, pave	12,000
South Lamar Street, rebuild and pave	51,585
Cockrell Avenue, Burnett to Alma, repave	7,035
Fairview, Grand to Culver, pave	5,725
Capital, Haskell to Kirby, pave	6,670
Capital, Fitzhugh to Henderson, pave	5,495
Seventh Street and company right of way, rebuild and pave	6,025
Edgefield, north of Davis, build passing track	5,000
Total	$541,875

SUMMED UP IN THE FOLLOWING:

Unfinished Everman Plan No. 4	$135,045
Everman plan No. 5	541,875
Add replacement job orders covering maintenance over and above franchise 18 per cent R., M. and D.	216,000
Grand total	$892,920

It is understood that the seventeen new Peter Witt cars will be ordered immediately, so as to get them ready in time for the Fair, that all unfinished

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Exhibitograph No. 14

CIVILIZATION
FOLLOWS
TRANSPORTATION

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and Learn Something!

September 22 to 28 inclusive
Cleveland

items on Everman plan No. 4, amounting to approximately $135,000, shall be completed in due time, that fourteen cars shall be rebuilt and converted to one-man operation, and that a bus line on Ewing Avenue, between Jefferson Avenue and Montana Street, shall shortly be placed in operation. Westinghouse and General Electric 140-hp. motors and type M multiple unit controls are used.

Pacific Electric Rebuilds Cars

Five electric-motor passenger coaches, eight electric operating trailer passenger coaches and five electric-motor combination passenger and baggage coaches were recently purchased by the Pacific Electric Railway, Los Angeles, Cal., from the Southern Pacific Railroad. The cars will be remodeled into eleven passenger coaches, six parlor car type passenger coaches and one business car, all to be electric-motor driven.

The cars are all of the same type, being 46 ft. 10 in. long and 9 ft. 5 1/16 in. wide and will weigh, when complete with motors, approximately 104,000 lb. The miscellaneous furnishings and articles to be purchased include illuminated destination signs, flush type toilets, Ohmer fare registers, parlor car type seats and dome type ceiling lights.

Track Extension Considered in Seattle

Officials of the Seattle Municipal Street Railway, Seattle, Wash., are giving close scrutiny to the available resources of the department to determine if there is any way to provide an extension of the car line serving Beacon Hill. Residents of that district have petitioned the city to extend the line a half mile from Beacon Avenue and Spokane Street to Columbian Way, and the South Beacon Hill Improvement Club offered its resources in helping to finance the extension. Other residents of the district have asked that the line be extended 1 mile. The whole matter has been referred to the Street Railway Department for recommendation.

Obsolete Industrial Equipment to Be Studied

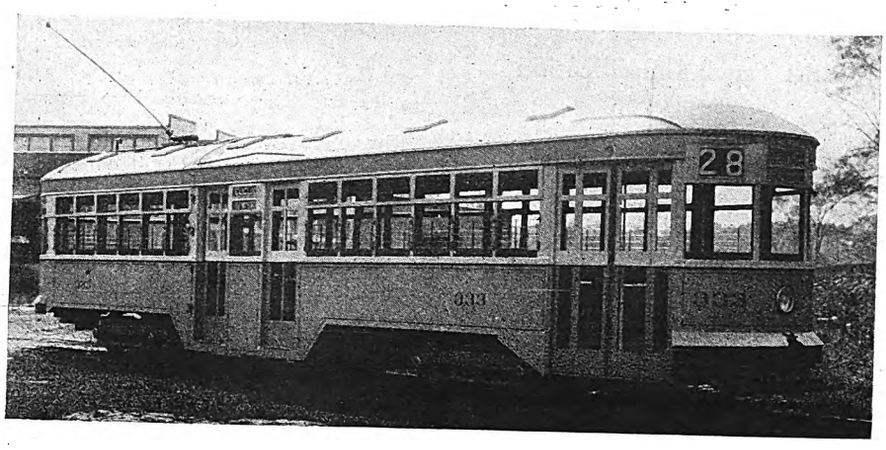
The Department of Commerce is about to undertake a requested study of industrial equipment. One objective of this study, which will be conducted by the Domestic Commerce Division, under immediate direction of H. C. Dunn, is to determine the amount of obsolete equipment and its importance as a factor in the inability of firms manufacturing similar products to compete on an equally profitable basis. The replacement of machinery which in point of service may have many years of useful-

Specifications on 50 Cleveland Cars

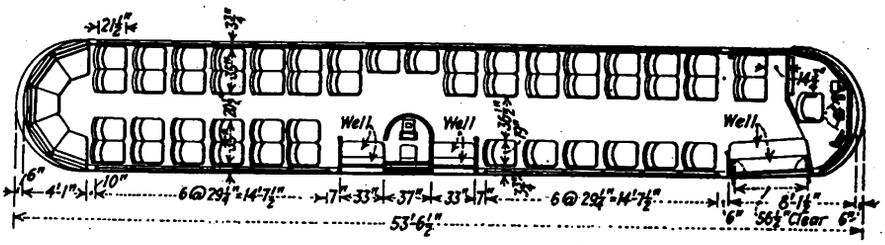
Fifty one-man, two-man passenger cars for city service are being built for the Cleveland Railway, Cleveland, Ohio, by the G. C. Kuhlman Car Company, Cleveland. The cars are single-end, double truck, motor, of the Peter Witt type.

Each car is 53 ft. 6½ in. long, 8 ft. 6 in. wide, weighs 44,800 lb. and seats 55 passengers. The body is of semi-steel construction with arch roof and doors in both center and end. The finish is in enamel, orange exterior with interior trim in mahogany.

Interior of one of the Cleveland cars



One of the 50 Peter Witt cars being built for the Cleveland Railway by G. C. Kuhlman Car Company



Seating plan of Cleveland cars. Note extra aisle space in front

Weights:	
Car body	19,600 lb.
Trucks	11,500 lb.
Equipment	13,700 lb.
Total	44,800 lb.
Bolster centers	27 ft. 6¼ in.
Length over all	53 ft. 6¼ in.
Length over body posts	40 ft. 4 in.
Truck wheelbase	6 ft. 0 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	10 ft. 10¼ in.
Window post spacing	29½ in.
Body	Semi-steel
Roof	Arch
Doors	Sliding at center and folding at front end
Air brakes	Westinghouse
Axles	Brill
Car signal system	Faraday
Compressors	Westinghouse DH-25
Conduit	Duratube
Control	HL
Curtain fixtures	National Lock Washer Co.
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	National Pneumatic
Energy saving device	Economy meter
Fare boxes	Cleveland Fare Box Co.
Finish	Enamel
Floor covering	Kass safety treads
Gears and pinions	Nuttall
Glass	DSA selected
Hand brakes	Peacock
Heaters	Consolidated Car Heating Co.
Headlights	Golden Glow
Headlining	Agasote
Interior trim	Haskelite, mahogany finish
Journal bearings	Timken
Lamp fixtures	Graybar
Motors	Four Westinghouse No. 340, inside hung
Painting scheme	Orange
Roof material	Poplar sheathing
Safety car devices	Safety Car Devices Co.
Sash fixtures	Adams-Westlake
Seats	Hale-Kilburn
Seat spacing	29½ in.
Seating material	Leather
Slack adjusters	Brill
Steps	Stationary
Step treads	Kass
Trolley catchers	Eclipse
Trolley base	Nuttall
Trolley wheels	Ohio Brass
Trucks	Brill 68-E-2
Ventilators	Nichols-Lintern
Wheels, type	Steel, 26 in. diameter
Wheelguards	Eclipse

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ness but which in point of satisfying the latest fancies of the consumer market is obsolete, is an important matter for the manufacturers. A sample survey will first be made to develop the plan of procedure and to learn what obstacles must be overcome.

Lamont Chairman of International C. of C.

Thomas W. Lamont, a member of the firm of J. P. Morgan & Company, has been appointed chairman of the American Committee of the International Chamber of Commerce, succeeding Owen D. Young, who had served as chairman for the last three years. Silas H. Strawn, of Montgomery Ward & Company, Chicago, was appointed a member of the Council with Robert E. Olds, former Undersecretary of State, as alternate. Charles F. Weed, vice-president of the First National Bank of Boston, has also been named a member of the American Committee.

Lift Truck Simplification Approved

A general conference of manufacturers and users of skid platforms and lift trucks, hand and power, held recently at the Department of Commerce, under the auspices of the Division of Simplified Practice, approved a proposed simplified practice recommendation for the dimensions of lift trucks and skid platforms.

The conference passed resolutions that two standard dimensions, 8 in. and 12 in., be adopted for under-clearance of skid platforms; and that "the minimum clearance between runners or supports of skids be not less than 29 in." In addition the conference went on record as favoring the establishment of standard dimensions for over-all length and width of skid platforms, with the proviso that there be two standards, one to be such that this size of skid can be placed three abreast in a freight car, and the other the same length as the first skid, but twice the width.

ELECTRIC RAILWAY MATERIAL PRICES—JULY 17, 1928

Metals—New York

Copper, electrolytic, cents per lb.	14.525
Lead, cents per lb.	6.2
Nickel, cents per lb., ingot	35.
Zinc, cents per lb.	6.55
Tin, Straits, cents per lb.	47.25
Aluminum, 98 or 99 per cent, cents per lb.	23.90
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	53.00
General service	31.50

Bituminous Coal

Smokeless Mine Run, f.o.b. vessel, Hampton Roads, gross tons	4.15
Somerset mine run, f.o.b. mines, net tons	1.825
Pittsburgh mine run, Pittsburgh, net tons	1.75
Franklin, Ill., screenings, Chicago	1.55
Central, Ill., screenings, Chicago	1.325
Kansas screenings, Kansas City	2.25

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, ⅝ in. and larger, cents per lb.	2.80
Tie plates (flat type), cents per lb.	2.15
Angle bars, cents per lb.	2.75
Rail bolts and nuts, cents per lb.	3.90
Steel bars, cents per lb.	1.875
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.40

Hardware—Pittsburgh

Wire nails, base per keg	2.55
Sheet iron (24 gage), cents per lb.	2.70
Sheet iron, galvanized (24 gage), cents per lb.	3.55
Galvanized barbed wire, cents per lb.	3.20
Galvanized wire, ordinary, cents per lb.	3.

Waste—New York

Waste, wool, cents per lb.	18.
Waste, cotton (100 lb. bale), cents per lb.:	
White	17.25
Colored	13.5

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	10.8
White lead in oil (100-lb. keg), cents per lb.	13.75
Turpentine (bbl. lots), per gal.	$0.60
Putty, 100 lb. tins, cents per lb.	5.50

Wire—New York

Copper wire, cents per lb.	16.625
Rubber-covered wire, No. 14, per 1,000 ft.	5.3
Weatherproof wire base, cents per lb.	17.125

Paving Materials

Paving stone, granite, 5 in., f.o.b. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd., f.o.b.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd., delivered	3.375
Cement, Chicago consumers' net prices, without bags, f.o.b.	2.05
Gravel, ¾-in., cu.yd., delivered	3.375
Sand, cu.yd., delivered	2.125

Old Metals—New York and Chicago

Heavy copper, cents per lb.	12.375
Light copper, cents per lb.	11.
Heavy yellow brass, cents per lb.	7.25
Zinc, old scrap, cents per lb.	3.25
Lead, cents per lb. (heavy)	4.675
Steel car axles, Chicago, net ton	$15.75
Cast iron car wheels, Chicago, gross ton	13.
Rails (short), Chicago, gross ton	15.50
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	6.25

TRACK AND LINE

PORTLAND ELECTRIC POWER COMPANY, Portland, Ore., is asking that the city share in the expense of reconstructing railway tracks made necessary by the widening and improvement of certain points of Larrabee Street by the city. The company points out that the present trackage was laid in 1918 at a cost of approximately $20,000 and that the proposed new work would cost an additional amount, reaching probably $19,000.

CALGARY MUNICIPAL RAILWAY, Calgary, Alberta, will lay a double-track line on Center Street from Seventh Avenue to Sixteenth Avenue, with the installation of a double-Y loop at the intersection of Center Street.

NOVA SCOTIA LIGHT & POWER COMPANY, Halifax, Nova Scotia, has signed an agreement with the City Council permitting the company to run its railway through Point Pleasant Park to Murtello Tower.

CORTLAND COUNTY TRACTION COMPANY, Cortland, N. Y., will make extensions in its transmission system.

TACOMA MUNICIPAL BELT LINE, Tacoma, Wash., has been authorized by the City Council to construct a single-track extension in Taylor Way, south 3,500 ft. from Lincoln Avenue, to furnish service to the Tacoma Electro-Chemical Company. The line will cost $12,000.

WORCESTER CONSOLIDATED STREET RAILWAY, Worcester, Mass., has started reconstruction of 550 ft. of double track on Salisbury Street. This job is estimated to cost $6,100 and will require a special curve, 25 tons of 7-in. 103-lb. girder rail, 600 ties, 8 kegs of spikes, 800 Lundie plates 30 thermit joints and 200 flat "T" rods.

SHOPS AND BUILDINGS

NEW YORK CENTRAL RAILROAD, New York, N. Y., has awarded contracts to Merritt, Chapman & Scott, Inc., New York, for the construction of an additional intake at Glenwood power station, Yonkers, N. Y., and to Miller-Blyth, Inc., New York, for the construction of a substation at Philipse Manor, N. Y.

MISSISSIPPI POWER COMPANY, Gulfport, Miss., plans to build a substation.

KANSAS CITY PUBLIC SERVICE COMPANY, Kansas City, Mo., has completed plans and specifications for the construction and installation of an elevator and conveyor to be used in transferring coal from a dump pit to the boiler room at the Tenth and Lister Street shops. The approximate cost will be about $2,000, and authority for its installation will be requested. Plans have also been completed for the construction of an incinerator, to be used for burning refuse from shop and cafeteria.

ALABAMA POWER COMPANY, Birmingham, Ala., plans an automatic substation at Holt, Ala.

TRADE NOTES

AMERICAN BRAKE SHOE & FOUNDRY COMPANY, New York, has announced the appointment of Maurice N. Trainer and Edward Barrett Smith as assistant vice-presidents, reporting to William S. McGowan, vice-president in charge of the eastern and southern sales department.

ELECTRIC SERVICE SUPPLIES COMPANY, Philadelphia, Pa., recently accepted the exclusive selling rights to passenger transportation companies of Rayflectors manufactured by the Atlas Manufacturing Company.

YELLOW TRUCK & COACH MANUFACTURING COMPANY, Pontiac, Mich., has increased its board of directors to fifteen members. Additional directors elected are G. A. Green, P. H. Geyser, L. Ruthenberg and H. J. Warner, all officials of the company.

W. J. STANTON, formerly with the Ohio Brass Company, was elected vice-president and treasurer of the Cuban-American Manganese Corporation with offices at 120 Broadway, New York.

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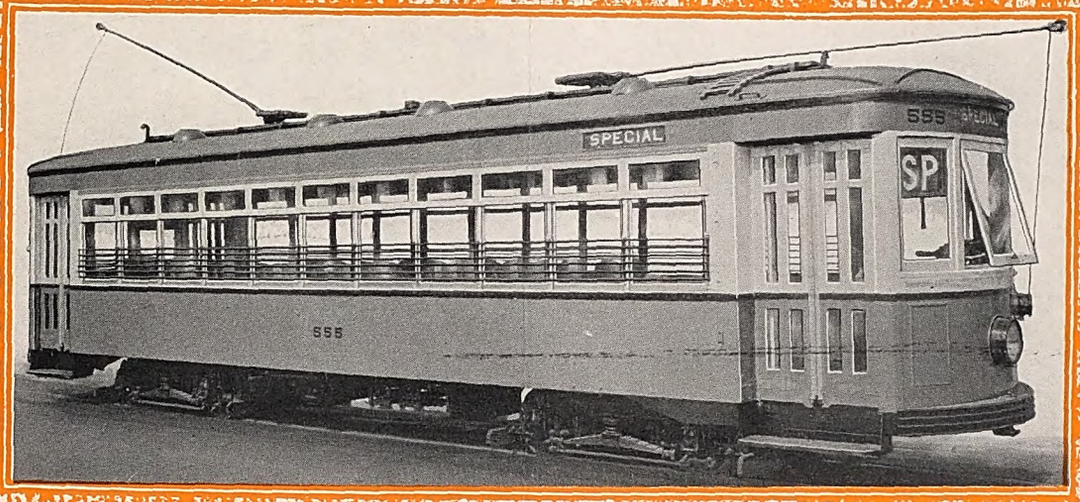

Springfield Ceases to Worry About Parking Problems

A short time after the Springfield, Mass., Street Railway Company purchased fifty light-weight cars from the Wason Manufacturing Company, the citizens of this New England city made a discovery. They learned to "take a trolley" and reach the business district of their city as quickly and comfortably as with the family automobile. They are not troubled with traffic conditions or the perplexing problems of parking. They have learned further that the new cars offer greater safety especially for women and children, with no additional drain on the family budget.

In short, the people of Springfield are pleased with the speed, safety and comfortable riding qualities of the new cars and therefore patronize them freely. Are the people of your city waiting to make a similar discovery?

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PHILADELPHIA, PA.

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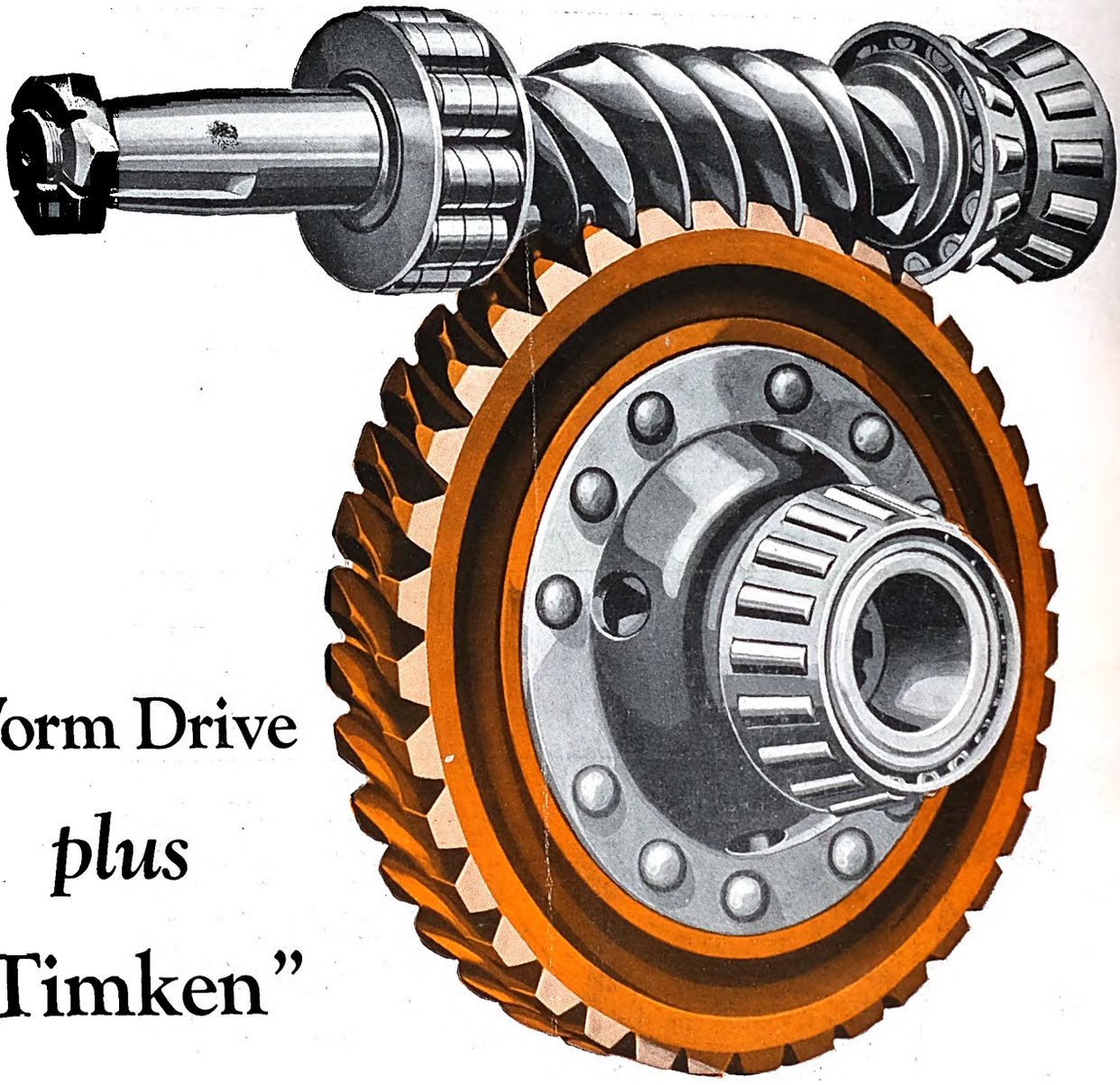

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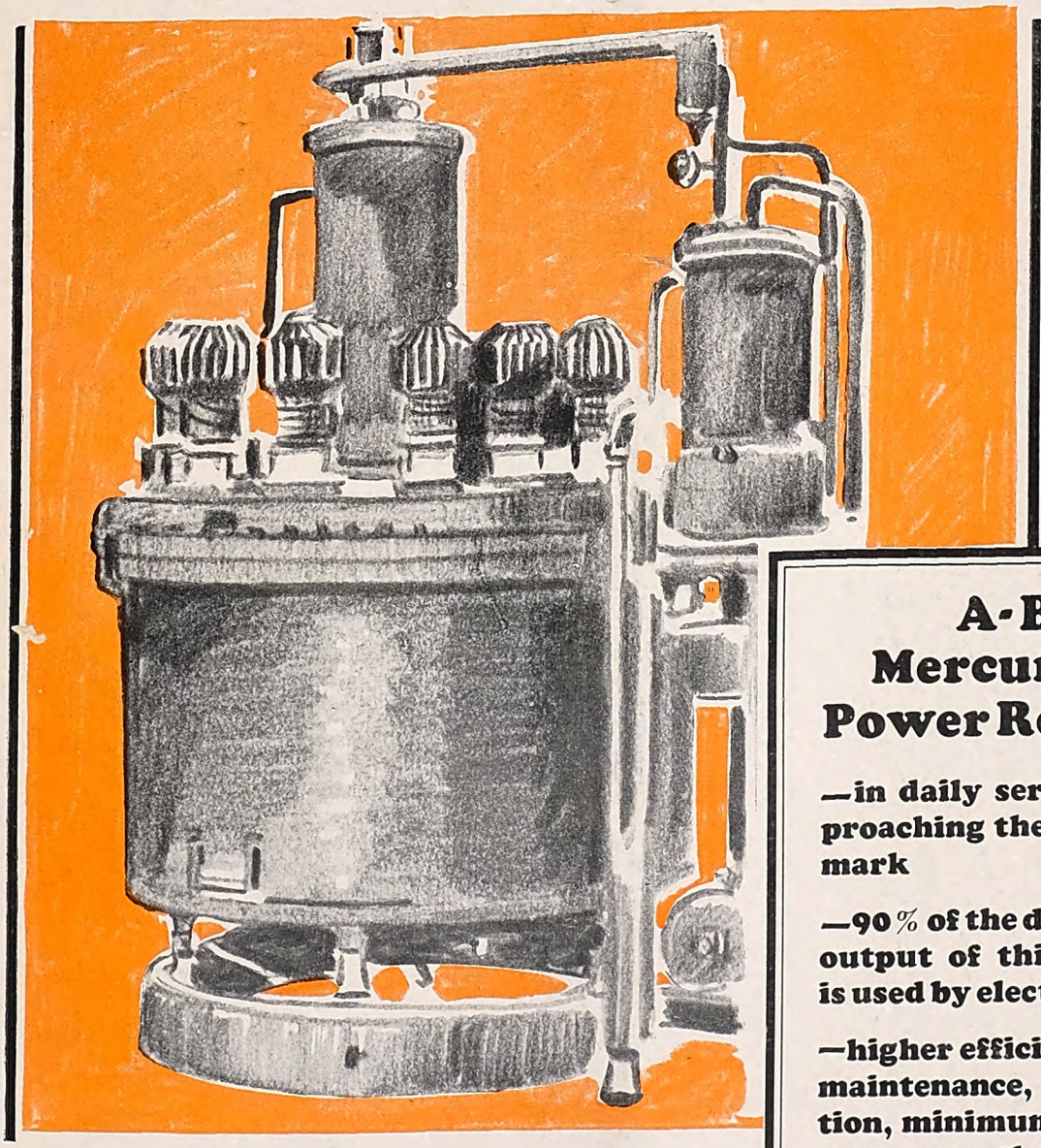
ELECTRIC RAILWAY JOURNAL

cGraw-Hill Publishing Company, Inc. JULY 28, 1928 Twenty Cents Per Copy



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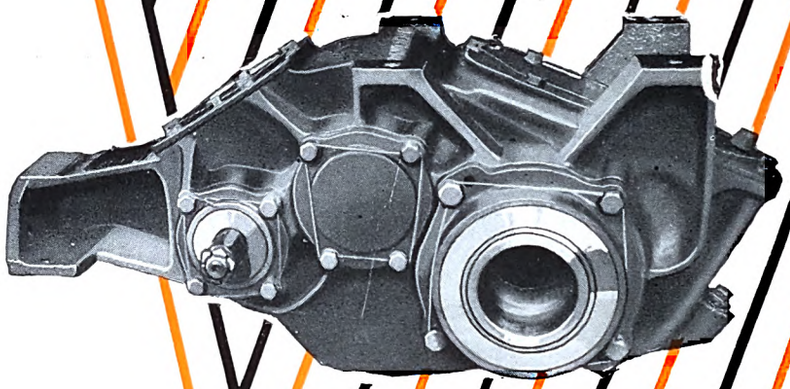

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of Street Railway Journal and Electric Railway Review
CHARLES GORDON, *Editor*

LOUIS F. STOLL, *General Manager*

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Boston Has Reason to Be Proud!

NEWS of progress in the operation of the Boston Elevated Railway under public control is always interesting. So, when the board of trustees, on July 17, repaid $895,518 to the Commonwealth on account of the deficit of $3,980,151 incurred in the first years of public operation completed just ten years ago, Boston has cause to stop, look and listen. The balance still due from the road to the cities and towns served which were assessed in 1919 to meet this deficit is $1,349,333.

General Manager Edward Dana naturally is enthusiastic over the condition of the road under the management of the public trustees, particularly since the greater part of this payment of nearly $1,000,000 comes from the earnings of previous years, and the actual surplus receipts over the cost of service for the current year ended June 30, 1928, were $82,811.

And Mr. Dana has real reason to be proud. When the public control act was passed, the trustees, in taking over the management of the road, incurred an actual deficit of nearly $5,000,000 the first year, since the $1,000,000 reserve fund was depleted that year. Not since then has there been a deficit. In the ten years just concluded the trustees have restored the $1,000,000 reserve fund and have made total repayment of $2,630,818 in liquidation of assessments of $3,980,151 against cities and towns served by the road.

With the exception of the repayment in July, 1923, the payment just made is the largest. In that year it was $1,114,557. Since 1923 only $103,000 has been repaid. The amount made available for repayment this year includes, among other items, approximately $250,000 reserved for taxes which are no longer required; $400,000 of dividends received from the Transport Mutual Insurance Company, as well as the adjustment of depreciation because of the change in the estimated service life of buses.

Incidentally the company's handling of the technical question of bus depreciation is of much interest. The depreciation of buses, it was explained by Mr. Dana, has been computed on an estimated service life of five years. This plan has been changed, as many of the buses have seen more than five years of service and consequently the adjustment has been made on the estimated life of six years. This is important since there has been so much discussion of the question of whether there was a disposition among railway men to penalize the bus by writing off the vehicle too quickly. All new buses purchased by the company have been rated with a service life of seven years and the depreciation charges of all buses owned by the company have been readjusted accordingly.

In the report on the receipts and cost of service for the twelve months ended June 30 a decrease over 1927 was noted in the receipts from fares. In the last twelve months total receipts were $35,009,933, about $600,000 less than the year before. On the other hand, the total cost of service was $34,927,121, leaving a favorable surplus of $82,811 in excess of receipts over cost of service, while in 1927, despite the greater fare revenue, the excess cost of service over receipts was $76,599. The summary of the operations of the company for the year ended recently, published in the JOURNAL for last week, makes plain the reason for the pardonable pride which Mr. Dana takes in the showing. As matters now stand the trustees have rounded out their ten years of service, the full period of the original lease, and have been able to meet expenses and to turn back a large part of the money which was borrowed from the municipalities early in the period.

A Determined Chief Executive

MEANWHILE Governor Fuller has doggedly stuck to his determination that the Legislature do something about the Boston Elevated Railway. When the attempt to extend the period of public control failed at the regular session he convened the legislators in a special session and admonished them that they might be kept in session all summer. But the public appears to have become exhausted over the matter. Either that or its representatives felt they had their say during the regular session. At any rate the public was conspicuous by its absence at the recent public hearing. Since there was not much else left for them to do under the circumstances, the legislators retired with all the evidence and documents garnered previously, and the special committee appointed in response to the Governor's special message has now reappeared with a series of three measures which it has reported in the Senate.

The committee would appear to have proceeded along lines that lead to the ends which the Governor has sought—the continuation of the period of public control with a reduction in dividends on the common stock, the appointment of a committee to study the question of further rapid transit extensions and a plan to construct an extension of the Boylston Street subway. The measures to this end were passed by the Senate on July 10. What will happen now is, of course, a matter of conjecture. The real fight is expected in the House.

At the regular legislative session the matter was bedeviled by differences of opinion among four factions. One, momentarily the strongest, was for complete public ownership; a second and generally strong faction was for public control; a smaller faction was for return of the road to private control; the fourth included the legislators who were "on the fence" and who came, in large part, from districts far from Boston and took no particular interest in Elevated legislation. If the attitude of the trustees of the Elevated is properly understood their position on the question of rapid transit extension

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is that the cost should be borne, to a major extent, by the taxpayers or persons whose real estate holdings are benefited, and to a minor extent by the car riders.

Even making allowance for the tenor of his utterance, there is much justification for the Governor's unmistakable show of impatience. It was his idea that to waste time talking about private ownership was to do nothing and that it was futile to talk about public ownership, since that is impossible at present. As he sees it, a continuation of public control leaves the way open in either direction, but furnishes means for providing facilities and improvements needed now. If this be true, then the Governor's strictures are justified. In this connection the comment of the Boston *Transcript* seems to be sound that if there had existed in the general court a strong, united desire to start, and to start now, a program of rapid transit improvements for metropolitan Boston, members of the House and Senate could have smoothed out the disagreements which divided them into hostile and opposing factions, each urging different financial plans.

New Need for Skip Stops Results from Changed Conditions

WHEN the so-called "skip-stop" system was first introduced on the electric railways of this country during the war, the underlying idea was to reduce energy consumption and thus save coal. With the ending of the war the need passed and the old stops have since been restored by many companies. In some instances this has been done by driblets and in other instances by a general return to the old plan. Probably about two-thirds of the stops once eliminated have been restored. Now, however, comes a new urge for skip stops. Traffic congestion in cities large and small is having a serious effect on the speed of operation. At the same time people have become accustomed to riding in automobiles and demand rapid service in public transportation vehicles. One of the best ways to accomplish this appears to be by a reduction in the number of stops.

Usually it is in a city's intermediate belt, partly residential and partly commercial, that the greatest opportunity lies for the elimination of stops. In the center of the city, stops are to be found at almost every street intersection, but the number of people using each stop is so great that any considerable reduction in their number would cause serious inconvenience. In the outlying regions stops usually are spaced fairly far apart. Moreover, the need for making stops here arises less frequently than in congested districts. But in the intermediate zone there is a stop at practically every corner, and nearly all of these stops have to be made on every trip. A reduction in the number of stops in this area undoubtedly would make possible a substantial increase in the speed of railway operation.

Elimination of stops is not now primarily a matter of saving money for the railway, but rather of giving more attractive service. It means depriving a limited number of people of a minor accommodation for the benefit of the majority of the traveling public. Those who may have to walk short distances probably will not like it. Some merchants will protest. The railway manager, however, cannot let the objections of a few individuals stand in the way of a service improvement for a far larger number. The problem is one of education and of reconciling public opinion to sacrifice by the few for the benefit of the many. It may not be easy to do this, but the watchword of the day is "speed" in transportation, and skip stops are one way to accomplish this end.

More Than the Poppy Comes Out of China

OUT of the East comes another of those ideas in the management of local railways hardly applicable to roads in the Occident, but no less interesting on that account. A while back the Turk ruled against the onion eater on the trams in Constantinople; now from China comes the news that the Peking tramway, having begun to pay a small profit for the first time in its three-year history, will be called upon by the government to contribute to the upkeep of 30 primary schools. Thus is the governmental snooper, about whom no end of jibes has been made, ever on the alert, even in the Orient.

As he reads the sayings of Confucius in the classroom in Peking, the future member of the On Leongs of New York or San Francisco probably will not cogitate upon the source from which his textbook is supplied, but the accountant of the railway, particularly if he is a native, will probably be very cautious about the financial statement of his company, conscious of the code of China which puts a price on the head of the next of kin where the culprit flees after a crime is committed and discovered. Meanwhile those of us in the Occident who had thought that the very limit had been reached in the ability of governments to devise new avenues of taxation will ponder the ingenuity of the silk-robed, leisurely Chinese official with his ways of approach less agile than his Western counterpart but no less efficacious. Others will cogitate on the story of Charles Lamb on the origin of roast pig.

Anyway, the news from China comes as a corrective to the notion, so frequently conveyed by the daily press, that the length of the imagination of the Chinese is confined to revolutions incited by the Bolshevik influence and to emigrating to America and running a laundry, selling chow mein or trafficking in the pollen of the insidious poppy. There have been pipe dreams before in newspaper offices in the United States in which narcotics have not played a part. Perhaps this new tax plan story is one of them. Anyway, it is to be hoped so. With all due respect to the Chinese, the tax gatherers in the United States need no help from them. Already they are too alert for comfort.

Instilling a Desire for Self-improvement

SELF-IMPROVEMENT is what has differentiated man from animal. The transportation worker is no different in this respect from anyone else. Given the opportunity to improve, the great majority will grasp it. The man who has the desire to develop is trying to make himself a better workman on today's job as well as planning for the job ahead. Not only is that the best way to obtain recognition and the opportunity for promotion but it gives the individual a sense of satisfaction that comes only from work well done.

As a rule the employee has few opportunities for learning how to do his own work better, save by his own efforts in performing it. The rudiments of any partic-

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ular task are usually taught by someone slightly more familiar with it than the beginner, but there the matter ends. On a few large properties, notably the Boston Elevated Railway, the Milwaukee Electric Railway & Light Company and the Philadelphia Rapid Transit Company, the opportunity has been presented to employees in all departments for learning the underlying reasons for the work they are doing and also the relation of their own work to that of others.

In particular in some of the courses of study offered by the Philadelphia Rapid Transit Company, outlined in an article in the JOURNAL for July 14, will it be seen that these courses are general in character and yet they bring a much fuller appreciation not only of the transportation business as a whole, but that part of it with which those taking them are directly concerned. That there was a real desire for the various courses on the part of the men is evidenced by the enrollment of some 4,000 during the first year they were offered.

Practical educational programs are received enthusiastically wherever they are offered. They assist the men to attain the highest standard of performance on their own jobs and to visualize where their work fits into the complete industrial program. They do more than this—they instill a greater desire in the employees for self-improvement.

Shifting the Burden of Proof

WERE proof needed that elimination of parking reduces vehicle congestion and increases street capacity, plenty is available in the comparative figures obtained in Chicago before and after the no-parking ordinance went into effect last January. Recent checks compared with those made a year ago on typical week days show an increase in vehicles entering and leaving the Loop in a twelve-hour period from 241,820 to 275,977. This is an increase of 34,157 vehicles or 14.1 per cent. In the same period there was an increase of only 10.6 per cent in the number of automobiles registered in the city, and when the count was taken this year business was quiet as compared with last year. Moreover, the traffic observed in the 1928 count was not up to the limit of capacity of the streets.

Even more surprising was the effect on street car schedules. The time needed to traverse the Loop was decreased 15 to 25 per cent and the movement of individual cars was much more uniform on account of the absence of delays. Cars can keep more closely to schedule, so that the spacing is better both inside and outside the central business district. Thus the effect of elimination of parking in a very restricted area is felt more or less throughout the entire city.

As to the effect on the merchants, according to their own reports many more people are coming to two of the largest stores by automobile than before the change. This should dispel the fear so often expressed that the merchants will be ruined by elimination of the parking privilege. Of course, a little arithmetic should show that it is possible to provide parking space on the streets to care for more than a small fraction of the persons who enter the stores, but to a skeptic nothing is so convincing as the facts developed from actual experience.

The results in Chicago should have a great significance all over the country. If parking can be eliminated in the Loop with such excellent effects there seems to be no reason why adoption of a similar restriction should not work equally well everywhere. The tests should be studied by traffic men generally all over the country. Now that the plan has been proved feasible, the burden of the proof should be on those who are opposed to elimination of the familiar rows of automobiles cluttering up the main thoroughfares, rather than on those who would free the streets of them.

Obtaining Maximum Benefit from Traffic Reports

NO USE is made of many of the city improvement plans prepared at considerable effort and expense. What is true of general city improvement programs has been true also of many of the city traffic surveys made recently. Occasionally the cost of the proposed improvements is too great; less often are the plans impracticable. Programs that are really worth while are, however, abandoned in deference to private, selfish interests. It is unfortunate for the general good of any city when those in authority have to protect either their own interests or those of others. While many public-spirited officials desire to consider the citizens first, the organized interests are able to press their claims much more loudly and effectively than the unorganized general public. As a result, many city improvements and traffic relief measures, elaborately planned and much needed, have failed of accomplishment.

The recommendations made on the basis of actual data obtained in the course of the survey and worked out after mature deliberation are the most valuable part of such a report. They are the remedies prescribed for specific ills and as such should receive the greatest consideration. Although at times fanciful and impracticable proposals have been made, most of the recommendations in reports of this character have been suitable and have been worthy of adoption. However, a check-up would reveal that comparatively few of the proposals have been put into effect without serious modification. In view of the need for traffic relief and the necessity for effective city planning which prompt such surveys, it is almost unbelievable that so many of the reports are filed away and forgotten so quickly without having received proper consideration.

Conflicts of public and private interests, such as those of an official who drives his automobile to work and parks it on the street all day, or the one who owns a business on a street a block away from the one for which relief is being planned, must be considered. The official who has pet schemes of his own and wants to adopt them in preference to those of the report must be shown that it is to his advantage to go along with the general plan. As long as the decisions are left to a few they will be made to please a few. It is only by intensive selling of the ideas embodied in the report to the public that a general insistence upon the passage of the neecssary ordinances will result. In other words, unless a popular demand for the adoption of the recommendations can be made they are likely to fail. Often what is needed is merely greater knowledge of the recommendations by the general public, and the development among the people of champions who will fight for the recommendations until they are adopted. In the instances where this has been done the maximum benefit has resulted.

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New Traffic Code Recommended for Boston

Erskine Bureau after extended survey urges reduction in street parking, improved signs and signals, establishment of street traffic engineering division and more stringent penalties for traffic violations. Means for facilitating traffic movement at street intersections are analyzed

FOLLOWING more than a year of investigation and study of the Boston Street traffic situation, the Albert Russel Erskine Bureau of Street Traffic Research of Harvard University has presented an extended report. The report was prepared under the direction of a special board of public officials and representatives of business organizations appointed by the Mayor to consider the problem. This board invited the Erskine Bureau, of which Dr. Miller McClintock is director, to conduct the survey, and the city made an appropriation to meet the expense of the work.

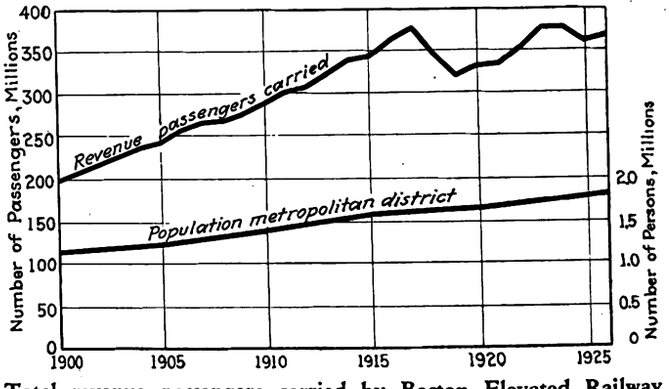
Briefly, Dr. McClintock's recommendations may be divided into three parts: The first relates to keeping the streets more clear. This can be done, he says, by a reduction in the time occupied by pavement repairs, the space taken by street openings and the storage of building materials; by the relocation or elimination of electric railway service on short sections of a few narrow streets downtown, by a better location of taxicab stands, and by a reduction in the amount of automobile parking. The second recommendation related to better control of existing traffic, both vehicle and pedestrian, and included the introduction of better route signs and traffic signals and the establishment of a new traffic code. The third recommendation covered the subject of future administration. It proposed increased authority to the Board of Street Commissioners over traffic and the establishment by them of a division of street traffic engineering; the organization of a Metropolitan Boston Traffic and Safety Conference, representing all of the towns concerned; the establishment by the police of an automobile traffic division, an increase in authority in traffic matters of the Police Department, and more stringent penalties for traffic violations.

Some Features of the New Code

In the proposed traffic code, red, green and amber signal lights are recommended. When both amber and red show, the crossing is for the exclusive use of pedestrians. At intersections where there is no police officer or traffic signal, a pedestrian within a clearly marked cross-walk has the right of way, provided he indicates his intention to cross by holding up his hand, the palm toward approaching traffic.

In connection with street cars, the code provides that operators of other vehicles shall not drive through a safety zone. If upon street car tracks elsewhere, they must leave as soon as practicable after a signal from the street car operator. They shall not stop, stand, or park a vehicle (except when necessary to avoid conflict with other traffic, or in compliance with the direction of a police officer or traffic sign or signal) between a safety zone and the adjacent curb, or within 20 ft. of a point on the curb immediately opposite the end of a safety zone.

The code lists a large number of streets and parts of streets where parking is prohibited except for three minutes to load and unload passengers or materials. Another clause designed to prevent night storage prohibits parking on any street for more than two hours between the hours of 1 a.m. and 7 a.m. On some streets time parking is permitted. In another list are the streets



Total revenue passengers carried by Boston Elevated Railway and population of Boston Metropolitan District

where there is to be no delivery of material or collection of refuse between 8:30 a.m. and 5:30 p.m. No vehicle designed or used primarily for advertising may be operated upon any through street nor in any business district.

For ordinary violations of the parking laws the report recommends a modified "tag" system. Under the present plan of tags and complaint cards issued by officers, a large number of offenders escape for one or another reason. Under the suggested plan, a separation would be made between serious traffic offenses and those resulting from ignorance or carelessness of a non-criminal character. The latter would be dealt with through a special bureau and not through a court, or if undertaken by the latter, full court procedure would not follow except with frequent offenders.

Organization and Methods of the Survey

While the survey was undertaken primarily to consider the problems of the city of Boston, it was considered necessary to devote some study to the metropolitan region, though no recommendations were made regarding traffic control outside of the city. The metropolitan region thus considered, including the city, has a population of 1,808,845, within which are registered 307,127 automobiles.

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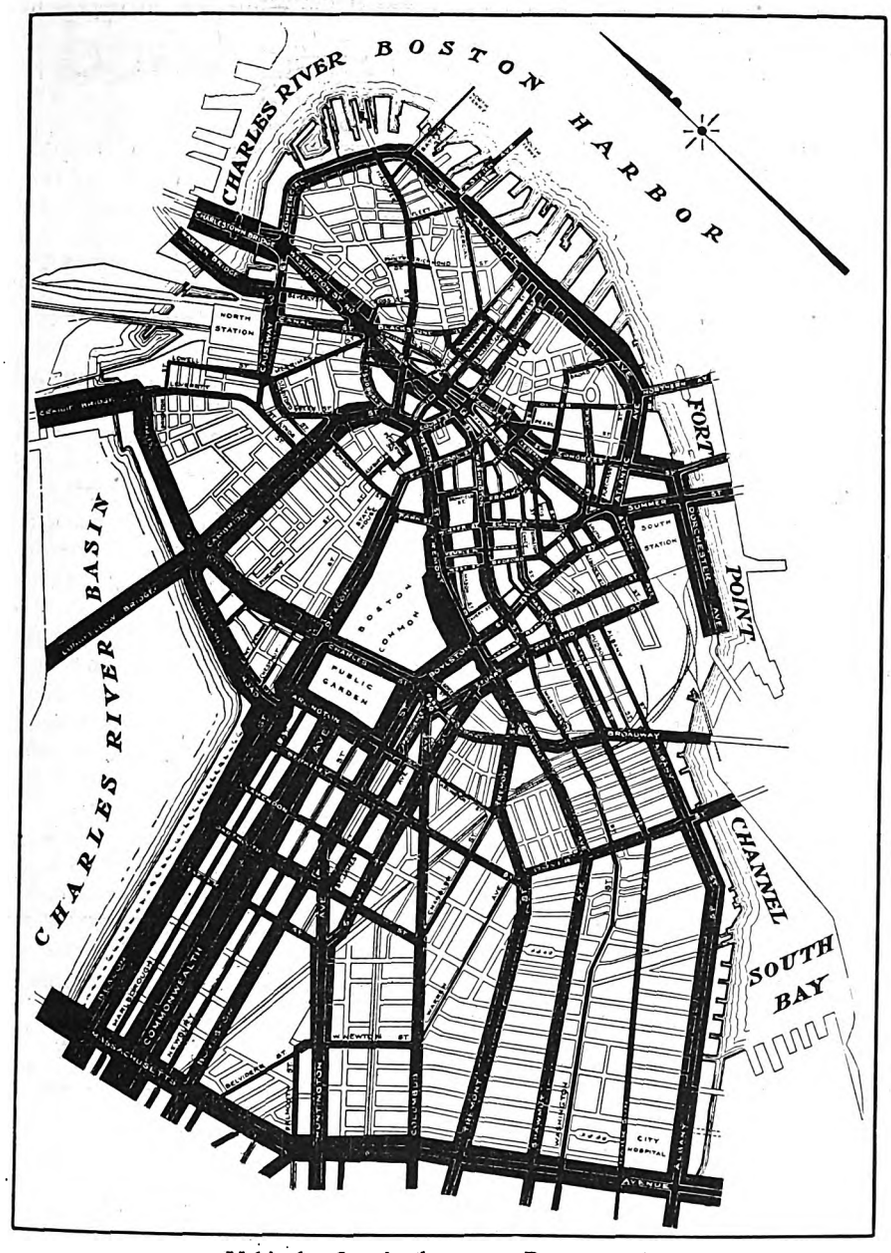

Vehicular flow in downtown Boston, 1927

The problems within the city are complicated somewhat by the winding, disconnected and narrow streets in the downtown section, though the fact that the streets are natural arteries gives some advantages not possessed by cities laid out on a rectangular plan. The city is fairly low in proportionate area devoted to roadways in the central business district, as shown by the accompanying table:

PROPORTIONATE AREA OF CENTRAL DISTRICT DEVOTED TO ROADWAYS

	Per Cent		Per Cent
Washington, D. C.	44	Minneapolis	30.5
San Diego, Cal.	41	Detroit	29.5
Cleveland	39.5	Chicago	29
Seattle	37.5	Denver	27.5
St. Louis	37	Salt Lake City	25.5
San Francisco	34.5	Boston	25
Portland	34.5	Toledo	25
Pittsburgh	34	Los Angeles	21.5

The growth of population in Boston and in its metropolitan region has not been so rapid as in some American cities but shows a definite upward trend. The center of business and commercial activity tends to remain fixed, as in other American cities, whereas the workers and purchasers tend to become more widely distributed. This means increased traffic and transportation requirements, as shown by the chart giving the rise in population and revenue passengers carried on the Boston Elevated Railway since 1900. The vehicular flow in downtown Boston is illustrated in the accompanying map.

Boston's business district is near the center of the original community development, but because of its zoning law the city has very few tall buildings. With certain exceptions there are no structures of more than approximately thirteen stories. This height limit has undoubtedly tended to spread business activity and to a degree has aggravated, rather than relieved, street congestion by adding to the requirements for street use in inter-communication between various establishments. This should not be taken, however, as an argument for the relaxation of the existing limit. Boston is far from having attained a general approach to the height limit permitted. When an average height of thirteen stories is approached, the central district will have a capacity and transportation problem many times beyond that which now exists.

Three accompanying charts show the fluctuation in traffic in Boston's downtown district on a typical week day (June 28, 1927). The first shows half-hourly fluctuation and accumulation of persons entering and leaving the inner cordon of downtown Boston by all modes of transportation from 7 a.m. to 12 p.m. The second chart shows half-hourly fluctuation of passenger automobiles, trucks and teams entering and leaving the same district, and the third the persons entering and leaving by mass transportation on the street. The peak loads, especially in the third chart, are very noticeable. The report declares that before long serious consideration must be given, both in Boston and in other large cities, to a suitable staggering of the work hours in office buildings, theaters and commercial establishments.

Control of Special Street Uses and Obstructions

One of the recommendations, as already explained, is a reduction of street openings, due to pavement repairs, as they are considered a serious obstruction to travel. The report recommends that where parking is prohibited on either one or both sides of the street, no permit shall be issued for street openings for repair to sub-surface utilities between 7 a.m. and 6 p.m. on any day except Sundays and legal holidays, though for emergencies a permit may be granted, provided the force works continuously until the repair has been completed. Where parking is limited to one hour or less, the appli-

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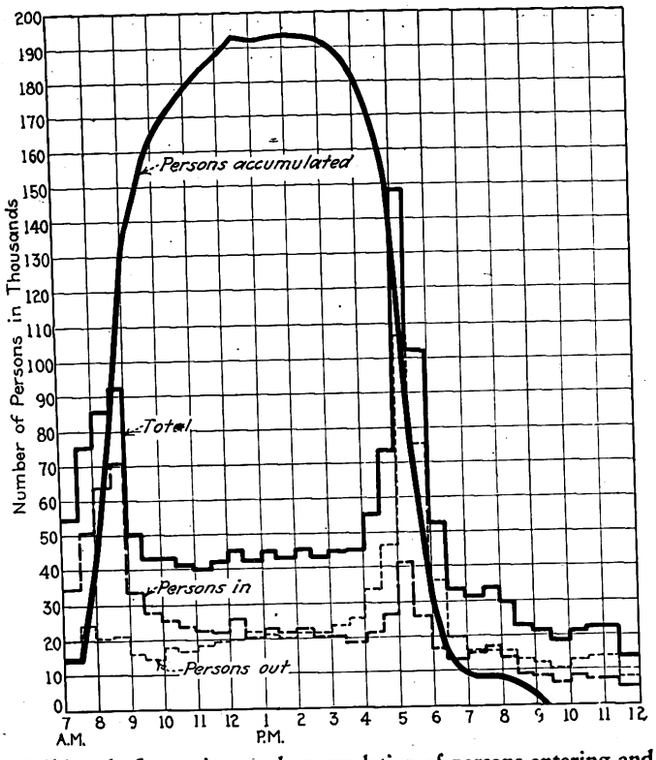


Half-hourly fluctuations and accumulation of persons entering and leaving the inner cordon of downtown Boston by all modes of transportation, 7 a.m. to 12 p.m., June 28, 1927

cant for the permit should maintain at least two shifts of eight hours during each 24 hours.

Much can be done in the way of limiting the time that stores materials and merchandise may be left on the roadway and sidewalk.

The survey showed that approximately 55 per cent of the taxicabs on the street are empty, due largely to cruising. While the more frequent abuses of cruising are subject to control, entire elimination of cruising would defeat one of the primary purposes of the cab, which is to make transportation quickly available. Much can be done to better location of taxi stands and in other ways. Transfer of the time assigned for the receipt and delivery of much of the merchandise to between 6 p.m. and 6 a.m. was urged. The tracks used by the Boston & Worcester electric freight cars could well be transferred to less congested streets.

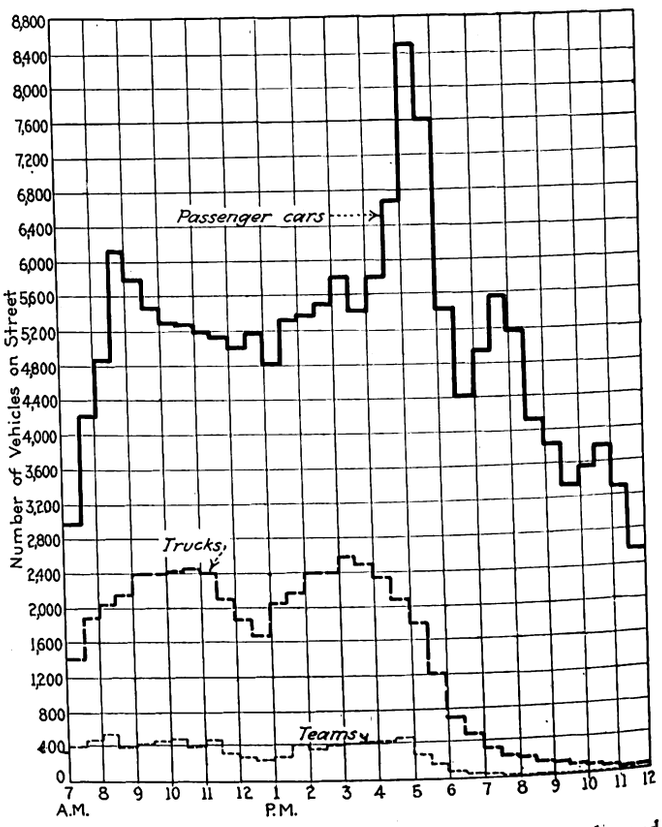
The Parking Problem

Many violations of parking regulations were studied in the central business district. Of the 20,600 parked vehicles recorded 5,964 were on streets where parking is prohibited. The average time requirement for parking in the central business district was revealed to be 41 minutes for all types of cars, including both those occupying prohibited spaces and those occupying spaces where parking is permitted for one hour only. In addition to time limits and prohibitions, present regulations specify certain restrictions in parking. The study reveals that Boston operators are careless in their observation of these regulations also. Of 30,925 vehicles checked in all districts, 9,698, or approximately one-third, were found to be improperly parked. Parking at an improper angle was the most frequent offence. The next most frequent type of violation was leaving the car too far from the curb. Cars parked nearer than 20 ft. from the street corner made up the next violation in order of number. It was found that 571 cars were violating the regulation prohibiting parking within 10 ft. of a hydrant, and 1,116 violated the regulation in regard to double-line parking.

Parkers may be divided into three classes: long-time parkers, short-time parkers, and live parkers. The survey showed that those who parked for four hours or longer constituted 0.9 per cent in the central retail district, 2.8 per cent in the wholesale district, 1.3 per cent in the office district, and 2 per cent in the Park Square and Boylston Street district. The survey does not look with sympathy upon long-time parking, as it limits the parking space available to the short-time parker and live parker. These classes have a more legitimate connection with business activity. The short-time parker is represented by salesmen, callers upon banking establishments or offices or wholesale houses, and the patrons of retail establishments. They frequently have to make calls at various points within a limited district and would find greater difficulty in utilizing a garage for each call than would the all-day parker in storing his car once for an entire business day. A one-hour limit is recommended as the maximum for parking where parking space is limited.

The live parking group is composed primarily of the drivers of private vehicles who are waiting for a passenger of the car to transact business and return. From the standpoint of safety and convenience, such a car with a competent operator is much less objectionable than any unattended car as it can easily be moved in an emergency. Live parking can be permitted at points where any other kind of parking should be prohibited.

A survey of the means used by patrons to reach ten large retail stores in Boston was made for the entire day of Nov. 4, 1927. Each patron received a ballot; 220,000 ballots were distributed and 56,681 were returned in such form as to be suitable for classification. The records in per cent in Boston as compared to Chicago and San Francisco, are given in an accompany-



Half-hourly fluctuations of passenger automobiles, trucks and teams, inner cordon of downtown Boston, 7 a.m. to 12 p.m., June 28, 1927

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ing table. The percentage using automobiles, 14.3, is large for a city with a rapid transit system, according to Dr. McClintock.

RETAIL PATRONS' MODES OF TRANSPORTATION COMPARED, PER CENT

City	Public Carriers	Walked*	Automobile Garage	Automobile Curb
Chicago	72.5	19.5	6.4	1.6
San Francisco	60.2	21.8	6.9	11.6
Boston	62.0	23.7	6.6	7.7

* Includes those walking from suburban trains.

As the present curb capacity is practically reached, the Retail Trade Board of the Boston Chamber of Commerce has undertaken to encourage parking in downtown garages by providing bus transportation between these garages and the principal shopping district. The bus line thus put into operation has carried nearly 25,000 shoppers within two months and the service is increasing constantly in popularity.

Pedestrian Protection by Raised Car Platforms and in Other Ways

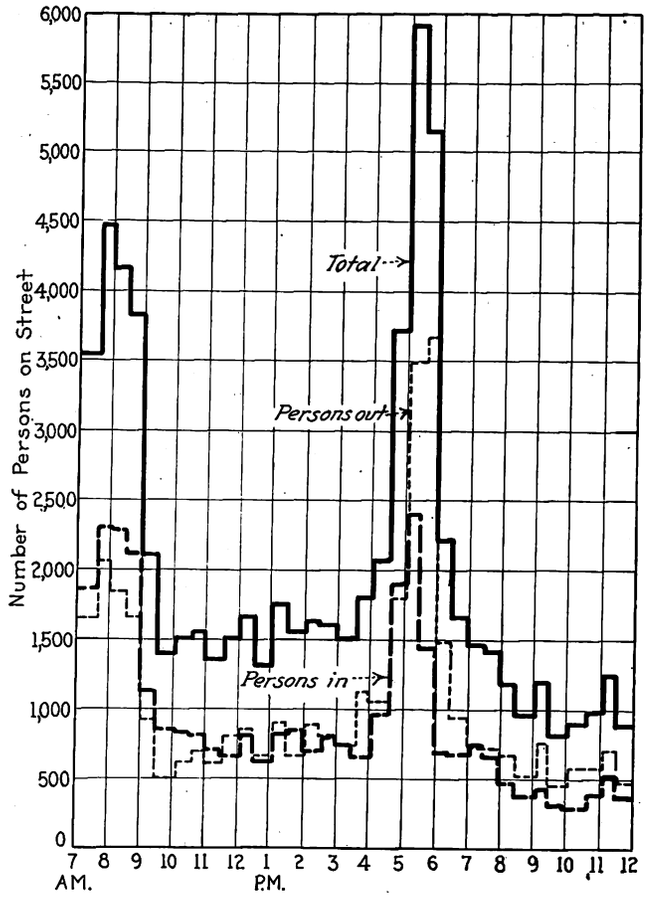
The primary traffic problem in the principal retail streets, the report says, is pedestrian protection and convenience. For this reason special attention was given to these problems.

Unfortunately, Boston not only has very narrow roadways but also unusually narrow sidewalks. At some points, for extended periods, from one-quarter to one-half of the total pedestrian movement is forced to use the roadway, to the discomfort and danger of those who do so.

Sidewalk congestion has been increased in the past because of the subordination of pedestrian requirements to the vehicular traffic at street intersection traffic control. The normal tendency of intersection officers is to favor the vehicular requirements, inasmuch as blocks of this class of traffic are more apparent than delays to pedestrians. The effect is a series of unreasonably long waiting periods at intersections during the time vehicular traffic is flowing. It is believed that the great majority of conflict between pedestrian and motor vehicles results from a confusion which is inevitable under present operating conditions. So long as motor cars are run over unprotected thoroughfares, the heaviest legal responsibility upon drivers will never be adequate to avoid frequent accidents, unless reasonable standards of self-protection are established for pedestrians.

As a suitable protection for pedestrians in the outlying districts, there is need for a fuller use of pedestrian safety zones at car stops along heavily-traveled ways. Preferably such zones should be of a raised platform type with a bulkhead of sufficient size on the traffic end to give actual and complete protection to pedestrians who may use it. It is unnecessary to say that such a zone should be properly illuminated so that it may not become a hazard to vehicular traffic. Where such physical protection at car stops cannot be given, due to the character of the location or the expense involved, protection should be sought by the establishment of safety zones marked by paint lines and illuminated signs, or through the use of traffic buttons with suitable reflecting devices. Such protective zones offer a desirable protection in wide streets or in the center of squares.

As a first step in the creation of a balanced system of rights and responsibilities between pedestrians and drivers, the survey recommends the adoption of a regulation giving pedestrians an unqualified right of movement across normal street intersections. The form of such right of way is indicated in the early part of this article.



Half-hourly fluctuations of persons entering and leaving inner cordon of downtown Boston by mass transportation, 7 a.m. to 12 p.m., June 28, 1927

The report does not recommend prohibiting pedestrians from crossing between street intersections. Under normal conditions such a prohibition is desirable, but it is thought hardly practicable in Boston because of the narrowness of the sidewalks. So the recommendation is made that between street intersections the vehicle has the right of way, though this does not relieve the driver from the exercise of due care for the safety of pedestrians.

The Position of the Street Car

In discussing the relation between street cars and motor vehicles, the report says that street cars suffer from automobile obstruction, because running upon fixed routes they cannot be maneuvered to avoid vehicles in their paths. On the other hand, drivers of motor vehicles are handicapped by street car movement, since these latter units must stop periodically for the purpose of picking up and discharging passengers.

The overtaking of street cars by automobiles presents two requirements. In the first place, the movement should be under such conditions as to give full safety protection to passengers boarding or leaving such cars. In the second place, where possible, a maximum freedom of movement to pass standing cars should be permitted to vehicle drivers to relieve the obstruction to traffic which this operation otherwise necessitates.

The state law which requires that drivers passing stopped street cars shall not come within 8 ft. of the running board or lowest step of the car, except at the

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express direction of a traffic officer or at points where passengers are protected by a safety zone, hardly gives sufficient protection for passengers boarding and alighting. A better provision would be that approved by the National Conference of Uniform Traffic Ordinances and Regulations. It is expressed as follows:

The operator of a vehicle overtaking any street car stopped or about to stop for the purpose of receiving or discharging any passengers, shall bring such vehicle to a stop, to the rear of the nearest running board or door of such street car and remain stationary until any such passenger has boarded such car or reached a place of safety, excepting that where a safety zone has been established, a vehicle need not be brought to a full stop before passing any such street car, but may proceed past such car at a speed not greater than is reasonable or proper, and with due caution for the safety of pedestrians.

Another regulation necessary because of the impossibility of street cars changing their course of travel to avoid traffic obstruction on their track is:

It shall be unlawful for the operator of any vehicle proceeding upon any street car tracks in front of a street car upon a public street to fail to remove such vehicle from the tracks as soon as practicable after signal from the operator of said street car.

To avoid accidents at intersections, the survey recommends the following provision:

When a street car has started to cross an intersection no operator of a vehicle shall proceed on the car track in front of the street car.

The overtaking of street cars to the left is filled with such hazard as to make the following section desirable:

The operator of a vehicle shall not overtake and pass on the left any street car proceeding in the same direction, whether actually in motion or temporarily at rest, when a travelable portion of the roadway exists to the right of said street car. The above provision shall not apply to one-way streets.

The desirability of safety zones has already been mentioned. As they are at those points where drivers may normally expect to find pedestrians standing in the roadway, there should be a definite community habit that motor vehicles should never be operated in such reserved spaces. To make this practice a part of the regulations, the following provision should be included:

It shall be unlawful for the operator of a vehicle at any time to drive the same over or through a safety zone as defined in these regulations.

Street cars as well as motor vehicles should cause as little obstruction as possible to travel. The officials of the Boston Elevated Railway should consider the elimination at route ends, of all layovers which necessitate the standing of street cars in important traffic ways for any period of time beyond that reasonably necessary to load and unload. This point can be covered by the following provision:

No directing officer or operator of any steam or street railway train or car shall operate or cause the same to be operated in such a manner as to prevent the use of any street for purposes of travel for a period of time longer than five minutes, except that this provision shall not apply to trains or cars in continuous motion.

Turning Movements

The principal intersection confusion at the present time results from turning movements. The left turn is the more complicated of the two. The right turn, though less confusing, offers interference to following traffic and necessitates the crossing of a pedestrian lane under conditions where the pedestrian is presumed to have a clear opportunity to cross. At controlled intersections, right turns should be made only on a positive signal to proceed, given either by the police officer or by the signal device. Normally, right turns should be made on a "go" indication, releasing all traffic in that general direction of movement. If, at special intersections, it becomes desirable to hold general through traffic movement during intervals when right turns should be made, a green arrow pointing in the direction of the right turn should be part of the traffic signal equipment. The right turn always should be made entirely subject to the rights of pedestrians who may be crossing on a "go" signal. The same general provisions for the safety of pedestrians should apply to the left turn as to the right. Left turns should be made at controlled intersections only on specific direction to proceed and subject to the rights of pedestrians moving with the least traffic.

Type of Signal Recommended

The type of signal best suited for general control purposes has three colored lenses, red meaning "stop," green meaning "go" and amber meaning "wait." Some cities have thought it desirable to eliminate the amber signal, but it has a utility in advising drivers moving toward a street intersection that makes it possible to stop before entering. It advises drivers waiting for release at an intersection that they are about to receive a "go" signal, and it has a special utility in warning pedestrians. A further argument for the retention of the amber light is to be found in the necessity of many of the more crowded intersections to provide special pedestrian intervals. In the past, this has been accomplished successfully by the showing of a combined amber and red light. The survey recommends a continuation of this practice.

In signals to be installed, those of the progressive coordinative type are recommended.

"No Parking" Works Well in Chicago

Checks show marked increase in total number of vehicles entering Loop district. Surface Lines saves 25 per cent in running time

EXPERIENCE with the no-parking restriction which went into effect on Jan. 10 in the Loop district of Chicago, points clearly to the success of the experiment. Two of the largest retail stores state that without question they have many more people coming to their stores by private automobile today than before the restriction. Checks made during May of this year to compare with previous counts, show a marked increase in the number of automobiles entering the Loop district; the increase being 14.1 per cent while the increase in automobile registration was 10.6 per cent. This is in spite of a general reduction in business activity. A cordon count shows a slight increase in the number of people coming into the central district as compared with the previous count. Practically all of the increase came from the private automobiles, as the number of public

COMPARISON OF COUNT OF VEHICLES ENTERING AND LEAVING THE CENTRAL BUSINESS DISTRICT OF CHICAGO TYPICAL WEEKDAY, MAY, 1926, AND MAY, 1928, 7 A.M. TO 7 P.M.

	Passenger Autos		Trucks		Horse-Drawn		Total	Total	Grand
	In-bound	Out-bound	In-bound	Out-bound	In-bound	Out-bound	In-bound	Out-bound	Total
May, 1926	92,425	88,421	24,399	24,710	5,825	6,040	122,649	119,171	241,820
May, 1928	109,434	104,772	25,665	27,316	4,326	4,464	139,425	136,552	275,977
Increase									34,157
Per cent increase									14.1
Per cent increase in vehicle registration for same period									10.6

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transportation vehicles remained about the same as before.

The Surface Lines has noted decidedly advantageous results from the changed street conditions in the Loop district after the no-parking regulation. The change resulted in a decrease of running time necessary within the Loop that amounted to from 15 per cent to 25 per cent for the various lines. Formerly, there were often delays resulting from second lane parking or from maneuvering to get into or out of parking space. These being eliminated the cars now make much more uniform speed. This produces a marked improvement in the regularity of the car spacing throughout the entire length of all lines leading from the Loop and so benefits all users of these lines even though they do not come into the central district. The reduction in running time can be expressed also as having been sufficient to release for improvement service about fifteen cars. This is the number formerly wasted by the delay beyond what now exists.

Colma "Bottleneck" in San Francisco Is Widened

Tracks of Market Street Railway occupy a 28-ft. strip in center of roadway, which now is 124 ft. in width

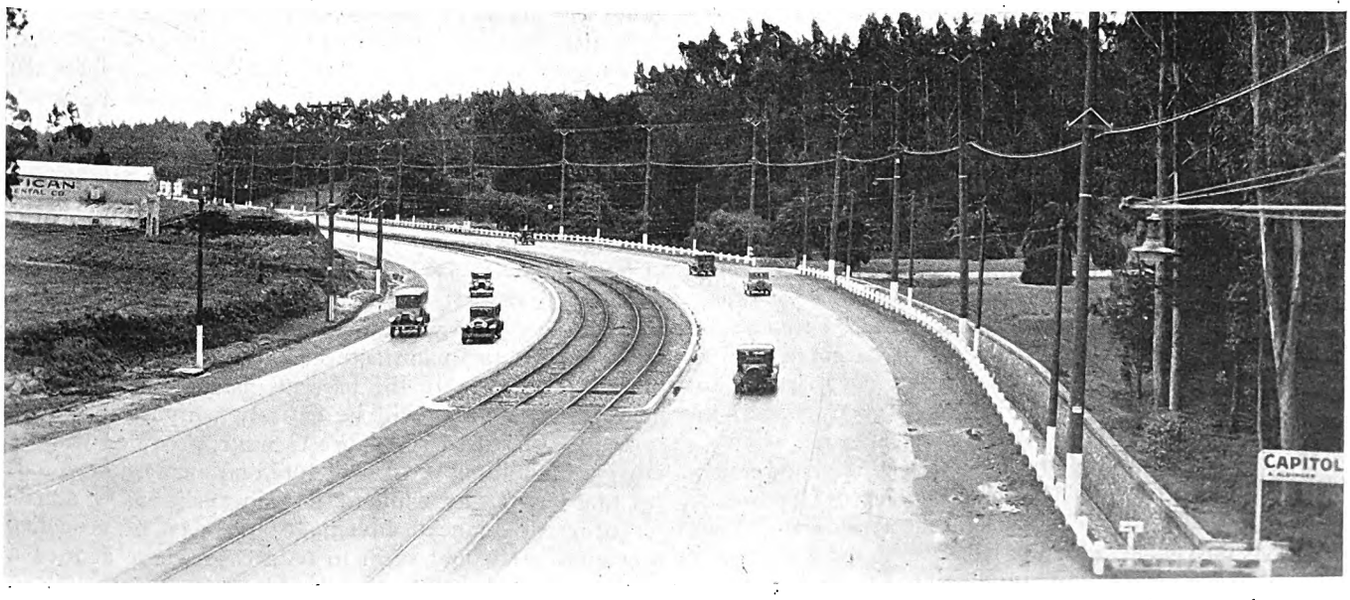
WIDENING Mission Road near Colma, south of San Francisco, for a distance of 1.6 miles and locating the double track of the Market Street Railway on a private right-of-way in the center of the highway, has relieved the congestion at this important point. The roadway before it was widened was only 24 ft. in width and consequently formed a regular "bottleneck." The highway is one of the busiest in the state, 19,000 cars being counted during a certain sixteen-hour period, so that the widening is of great importance.

The completed artery has two concrete paved roadways 40 ft. in width for vehicular travel, a 28-ft. private right-of-way between the two paved sections for the double track of the electric railway, and strips approximately 10 ft. wide on the outside of the pavement. The railway's right-of-way is inclosed by a curb 1 ft. high, and at crossings where there is danger of automobiles driving into the open track construction red reflectors are mounted.

Approximately $600,000 was spent in widening the highway, the share being borne by the railway in centering its tracks being $55,000.

View of the "bottleneck" before the widening. Much congestion resulted at this point because of the narrow roadway

Red reflectors placed between the tracks give a warning to motorists where track and highway separate



View of the same section of Mission Road after it had been widened and the Market Street Railway tracks centered

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Increasing Rail and Tire Life

It should be possible to get greater wear by suiting the rail and the wheel surfaces to each other

By James Silberstein
Metallurgical Engineer, Chicago, Ill.

SINCE railways began to grow and develop the rail problem and, perhaps in a slightly lesser degree the tire problem, have always been with us. Today they are of greater importance than ever, not only because heavier loads and higher speeds impose more strenuous conditions on both wheels and rails, but also economic conditions make the profitable working of the railways an increasingly difficult problem. The life of rails and tires in relation to their cost is an important factor in railway economics, and is thus of interest not only to those concerned with the railways themselves, but to all those affected by the satisfactory and economical working of the railways.

It is obvious that the use of heavier axle loads and of higher speeds demands the use of harder materials, if only from the viewpoint of actual surface indentation. That actual indentation under wheel loads must be amply avoided is clearly necessary, since otherwise rapid destruction of the surface layers must follow. Actually, while perceptible permanent indentation under the wheel loads probably never occurs in normal service there are occasions when special conditions lead to very severe local loading of both rail and tire, as, for instance, by the sudden application of brakes, leading to skidding of the wheels. The effects of such loading, especially in connection with the formation of transverse fissures, has been studied, and it has been found that such loading is far more destructive than ordinary wear.

The natural tendency toward the use of harder steels has been followed extensively in practice. Some twenty years ago a steel rail with a carbon content of 0.25 per cent was regarded as normal, and fears were expressed that the use of higher carbon steel, although furnishing a harder steel rail and one likely to be more durable, might prove dangerous on account of the much reduced ductility. The experience of recent years has failed to confirm entirely either the favorable or the unfavorable anticipations in regard to rails made of harder steel. They have not proved unduly brittle or dangerous on account of their lower ductility, but, on the other hand, their greater hardness has not resulted in a corresponding diminution of the rate of wear. This latter fact has led to extensive investigations on methods of testing the abrasion resistance of steel. Finality in method of testing for this purpose has not yet been attained, and different types of abrasion test still yield results which are not fully comparable. All agree in showing, however, that hardness as measured by indentation tests, and therefore tensile strength, is not a measure of wear-resisting quality. As yet it is not possible to state to what other physical properties of steel this power of resisting abrasion is related, and we have either to be content with empirical test data for comparison or have to resort to the slower method of testing various types of steel in service in order to arrive at a basis of selection.

Meanwhile, metallurgists have not been idle, and much has been done towards the improvement of the wear-resisting quality of rail steel by heat treatment. This has been developed according to several somewhat different methods, which all aim at giving the rail a hardened wearing surface without converting the entire section into hardened and relatively brittle material. However, it must be admitted that here also finality has not yet been reached. Progress is rendered difficult, from the metallurgical point of view, by the strict limitation of cost for a material which has to be employed in such large quantities as rail steel. The use of alloy steels is for that reason almost ruled out, unless they could be shown to have more than a proportionately longer life.

Even in simple carbon steels the question of cost as affecting quality is important. Sound steel, free from both pipes and blowholes and of good chemical composition, undeniably costs more than a blown steel of lower purity. If, however, special heat treatment is at all worth while, attention to the quality of the steel to be treated is fully as important. To heat-treat a poor quality rail is simply waste of time and money and leads only to the discrediting of the heat-treatment method. It is true that the soundest steel neither is proof against rapid wear under adverse conditions nor apparently exempt from transverse fissuring, but its resistance can be materially increased by heat treatment. The same treatment applied to unsound steel can never overcome the inherent defects of the material, and by the formation of cracks even may intensify them.

Tires Are a Less Difficult Problem

The tire problem, although intimately bound up with that of the rail, is not quite so difficult. The tonnage of steel concerned is not nearly so great and the question of cost of the steel not so prohibitive. Even in tires, however, alloy steels are not, as yet, very widely used, and reliance is placed on high-carbon steel. Here, however, attention is seriously given to the quality of the steel as regards soundness, chemical composition and segregation. The modern method of rolling tires from cheese-like sections of ingots or billets, instead of from the old beehive ingots, has eliminated some serious risks of unsuspected unsoundness. On the other hand, cracking still occurs sometimes as result of the stress produced when the tire is shrunk on to the wheel. The stress which is imposed upon the tire as the result of shrinking on, although it may lead to fracture, presumably does not affect the wear resistance of the tire. The latter may perhaps be regarded as reasonably satisfactory at the present time, but if the wear resistance of the rail is increased it must imply increased wear on the tires, unless the quality of these is proportionately improved.

At present the tire is much harder than the rail, and the rail is worn away. If the conditions of hardness are reversed, then it is the tire that would take the wear. Here the use of special heat-treated alloy steel may prove to be necessary, but again the question of abrasion testing arises. It is, indeed, only when we can readily determine the wear-resisting properties of our materials that we shall be in a position to discover, without the need of long and costly service trials, better materials for these special purposes. This is surely a matter of primary importance to the railways. The user of materials generally expects the manufacturer to carry out research and initiate progress. In the present instance, however, the gain from progress will be entirely with the user, the railway. Increased resistance to wear, provided without any great additional cost, will entail no increase of output for the steel-maker, while to the railways it will be a matter of great financial advantage and even of economic necessity. It would seem to be a case where at least a great part of the onus of providing for progress should fall directly upon the user.

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Buses on eight city routes of the company circle the "loop" district of downtown Tulsa

Short Interurban Is Backbone of Extensive Bus System

By R. V. Miller
General Manager Oklahoma Union Railway, Tulsa, Okla.

Twelve city bus routes reaching all sections of Tulsa, Okla., and three intercity bus lines extending approximately 116 route-miles operated by Oklahoma Union Railway

CONDITIONS usually existing where combined bus and car services are found are somewhat reversed in Tulsa, Okla., where the Oklahoma Union Railway has built up a city-wide bus system in connection with its interurban railway. Only one city car line is operated by this company, over its interurban tracks within the city limits. Yet twelve city bus lines, extending 56.8 route-miles and handling 20,000 passengers per day, are operated by the Union Transportation Company, the bus operating subsidiary of the Oklahoma Union Railway. In addition to the city route, the company has three interurban bus lines with a total mileage of approximately 116 route-miles.

The railway interurban line is 24 miles long and joins Tulsa and Mounds, passing through Sapulpa. No passenger service is given between Mounds and Sapulpa, this portion of the railway being used for freight only. Between Sapulpa and Tulsa hourly passenger service is given and a great many passengers are carried. Sapulpa is the termini of several bus routes and many passengers transfer at this city to the interurban railway to continue to Tulsa. The railway enters Tulsa from the southwest,

TABLE I—OPERATING DATA OF THE CITY BUS ROUTES. THE ROUTE NUMBERS ARE KEYED TO THE ACCOMPANYING MAP

Route No.	Headways, Minutes Base	Headways, Minutes Rush Hour	Number of Buses Base	Number of Buses Rush Hour	One-Way Route, Miles
1, 9, 9A } Through Buses	7	4	10	14	8.0
1A	15	15	1	1	1.3
4	12	12	4	4	2.8
5	15	15	3	3	4.2
6, 7 } Through	5	3	10	16	9.1
6A	15	15	2	2	2.0
6B	30	30	1	1	4.0
7A	15	15	1	1	1.0
8	10	10	3	3	2.7
10	10	10	4	4	3.3
11	12	12	5	5	5.1
12	60	60	1	1	5.5

TABLE II—DIVISION OF BUS OPERATING COST ON CENTS PER BUS-MILE BASIS

	Cents
Operating Expenses	
Maintenance of plant and equipment	2.90
Depreciation of buses	2.62
Garage	5.27
Transportation	5.10
Traffic promotion	0.09
Administrative and general	2.03
Total	18.01
Fixed Charges	
Taxes	0.25
Rent	0.01
Interest	1.38
Total	1.64
Total operating cost per bus-mile, cents	19.65

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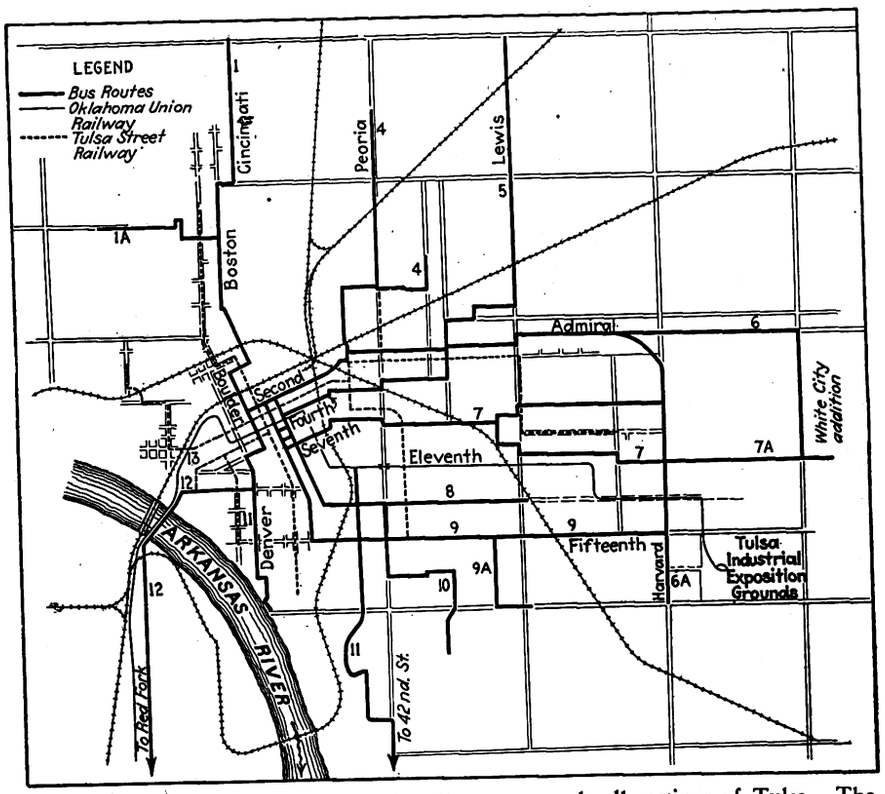
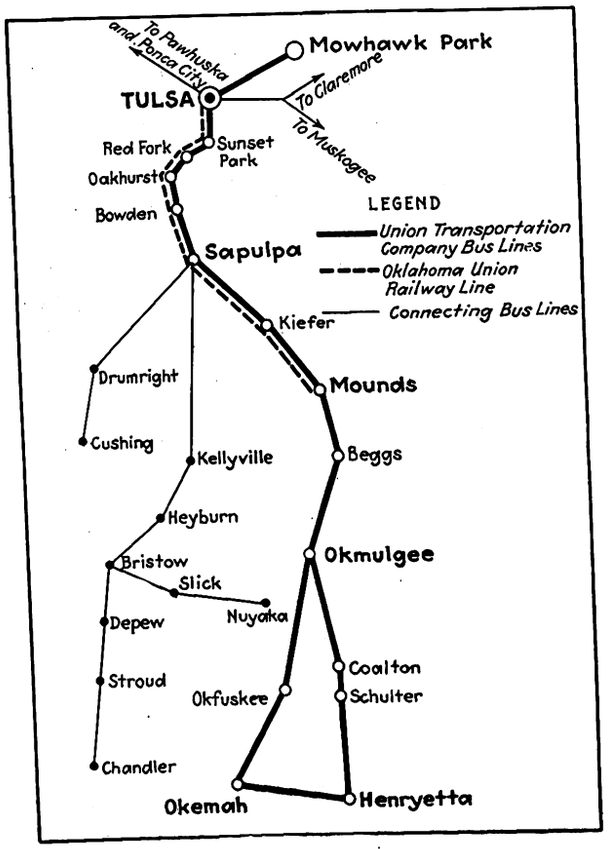


Bus routes of the Union Transportation Company reach all sections of Tulsa. The interurban line of the Oklahoma Union Railway, the parent company, also handles part of the city traffic

passes through the main business section and terminates at the Tulsa Live Stock and Industrial Exposition grounds in the southeast part of the city. The track leading to the Exposition grounds is used during fairs, when carload freight, as well as passengers, is handled.



Map showing the intercity bus lines of the Union Transportation Company and the interurban line of the Oklahoma Union Railway. Connecting bus routes, also shown, bring much business to the company

Buses Followed the Jitneys

Early motorized transportation service in Tulsa was by jitneys. Through organized association the individual jitney operation became a disorganized system, all of which was purchased by the railway. With the intention of forming a city-wide bus system, the company extended its lines to all sections of the city. The same procedure was followed in establishing intercity bus service. The extensions were made to the interurban and competition prevented along the main line. Through cooperation with independent intercity bus operators radiating out of Sapulpa, these lines terminate there and the traffic is transferred to the electric cars for the run into Tulsa.

City street car service is given by another company in Tulsa. Transfers, however, are exchanged between cars and buses of the two systems. Transfers also are issued and accepted between cars and buses of the Oklahoma Union Railway. The fare on the buses and on the street cars of the Union Transportation Company is 10 cents cash, with three tokens for 25 cents.

City bus service is given from the business district to outlying sections, all main lines radiating from the so-called "loop," a rectangular route four blocks one way and two blocks the other way. All buses move in a clockwise direction in circling this loop. Four short lines are operated as branches to the eight main routes. Four of the main lines are consolidated for through route service from one side of the city to another, passing through the business district en route.

Service on the twelve routes varies from a frequency of five minutes to thirty minutes during the day. The frequency is increased during the peak hours. Detail operating data on the service given by the city system are given in Table I. The route numbers are keyed to the accompanying map of Tulsa.

Sections of the city unserved by car lines, as well as districts served by the local railway, are included in the scope of the system. The ability of the bus to enter restricted residential areas has enabled the company to develop a new business. New subdivisions are entered with the branch lines. One bus over a short route with frequent service is used to determine whether or not a main line is needed for that particular district.

Several Cities Reached By Interurban Buses

The main intercity bus line of the company extends from Tulsa to Okemah, passing through Sapulpa, Mounds, Okmulgee and Henryetta. It is 77.1 miles long and serves, in addition to the cities named, several smaller towns. Five buses are operated daily in each direction over the route, and in addition one bus per day in each direction is scheduled between Okmulgee and Okemah.

The other two intercity lines are much shorter. One of these, joining Okmulgee and Okemah by way of

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Exclusive residential sections of the city are reached by the buses. The bus in this view is in front of the Tulsa High School

Okfuskee, is approximately 31 miles long. Inasmuch as quite frequent service is given between the two terminal cities on the main line of the company, only one bus per day is operated over this route. The second short line connects Mowhawk Park with Tulsa, a route 7.5 miles in length.

Several buses that could be refinished for future use were acquired by the company when it took over all organized jitney operation. To these the company has added Mack 25-passenger equipment until the entire fleet now totals 80 vehicles. The equipment used in city service, all of the street car type, includes twenty-eight 25-passenger Macks, eighteen 21-passenger Reos, sixteen 21-passenger Grahams and one 21-passenger Studebaker. The buses used for intercity service include two 29-passenger Macks, four 21-passenger Reos, two 18-passenger Grahams, one 14-passenger Buick and one 12-passenger Buick, all of the sedan type, and two 25-passenger parlor-car type Macks.

The company uses two large garages in Tulsa for its buses. One of these cares for all maintenance work and is the main operating garage. It has facilities for complete overhauls, painting and repairs. The offices of the mechanical and purchasing departments, as well as the storeroom for the Union Transportation Company, are located in this building. The second garage, built by the company in 1927, is used for storage. It is of brick construction, measures 140x120 ft., and is located adjacent to a siding of the interurban line.

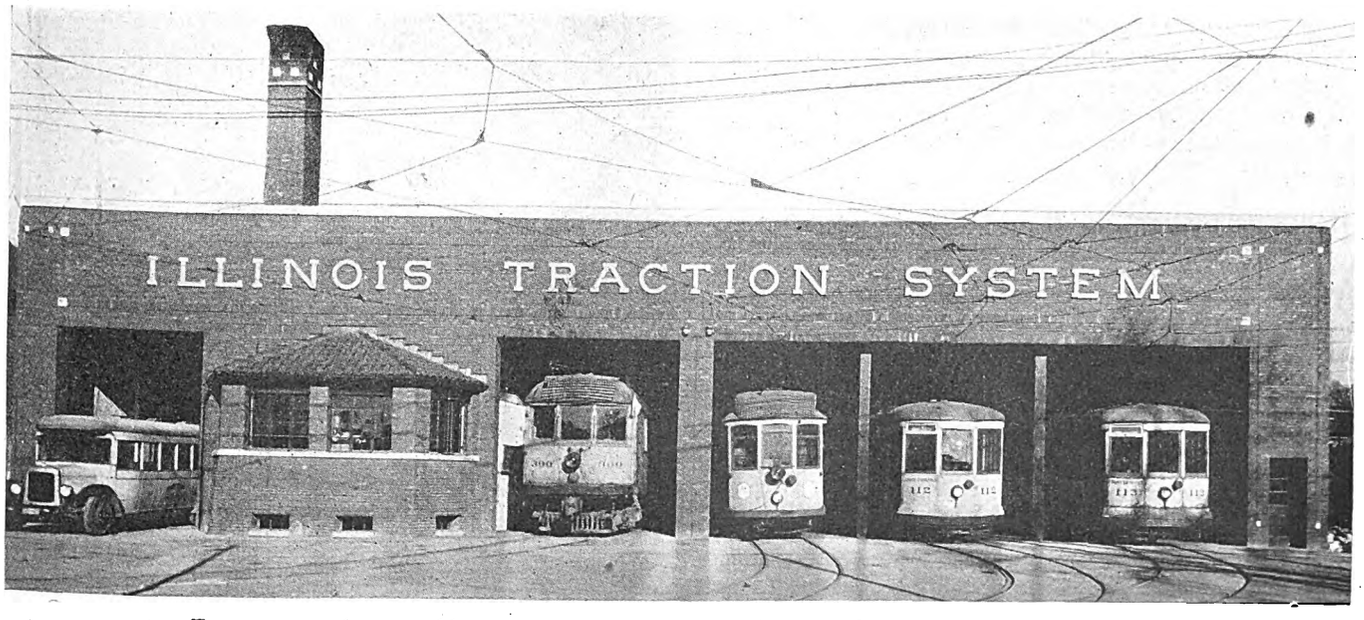
Gasoline is purchased in tank car lots and stored in two tanks of 7,000-gal. capacity, buried back of the new storage garage. The fuel flows by gravity to three measuring pumps at the front doorway. Tires are purchased on a mileage contract. The mechanical force is under direct supervision of the master mechanic, although separate from the car maintenance force. Practically the same procedure is followed in inspection, repair, servicing and overhaul programs as is followed in railway work.

For the entire bus operation, which includes approximately 3,500,000 bus-miles per year in city service, 500,000 bus-miles in intercity service, and 12,000 bus-miles in chartered service, the cost per bus-mile is 19.65 cents. Of this figure, 18.01 cents is credited to operating expenses and 1.64 cents to taxes, rent for leased property and interest. Depreciation on the equipment is figured on a three-year life basis. The detailed division of the operating cost is given in Table II.

Carhouse and Garage Expand Facilities

ENLARGED facilities for handling equipment of the co-ordinated railway and bus service of the Illinois Valley division of the Illinois Traction System are provided by the completion of a new carhouse and garage at La Salle, Ill.

The structure is 145 ft. long and 108 ft. wide, constructed of brick with face brick front, and has concrete floors throughout. Rolling steel doors at the front entrances are of material assistance in keeping the



Entrance to carhouse and bus garage, showing entrances for buses, freight cars and passenger cars

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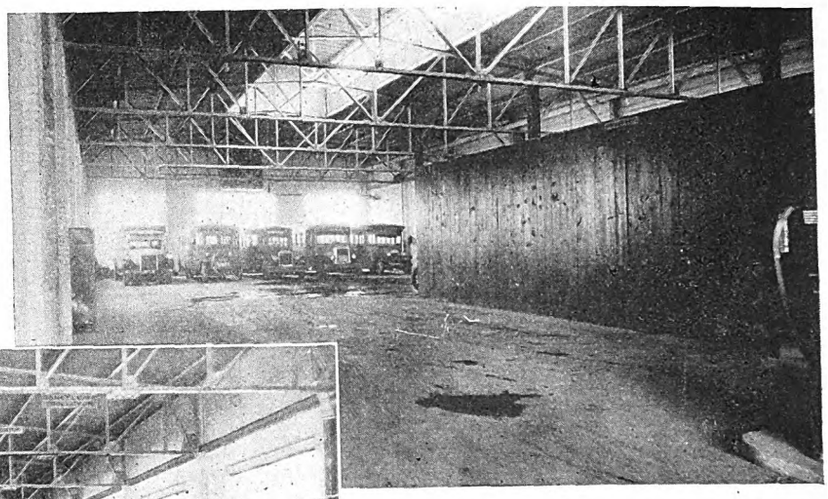
interior comfortable in inclement weather. Of the five entrances to the building front, one is to the garage section, one to the freight loading platform, and the remaining three to tracks extending the length of the carhouse. The name "Illinois Traction System" across the front of the building is in the tangerine color used on all the Illinois Valley cars.

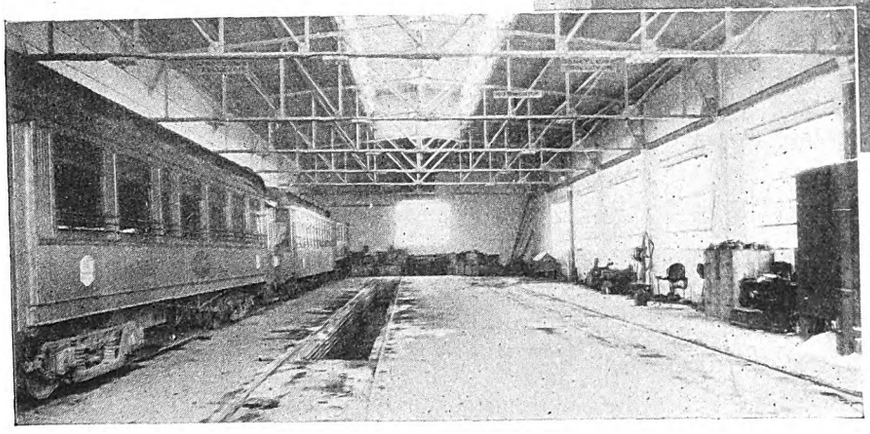
Three tracks enter the carhouse proper, in which nine cars at a time can be stored. A well-heated and drained track pit 80 ft. long accommodates two cars. On one track at the extreme end of building is located a wash rack where all cars are cleaned regularly. A sand bin is placed at the front end, making it easy to supply sand to each car as it comes in at night. Lighting fixtures are arranged for either alternating or direct current supply. A work bench, locker, drill press and blacksmith's equipment are on the east side of the tracks, where ample natural light is available through five large windows in which are used Solite panes of glass.

A fourth track enters the freight-loading section of the building where a platform 60 ft. long and 12 ft. wide provides room for both carload and l.c.l. freight.

The garage section accommodates twelve buses and has a pit 20 ft. long and 3 ft. wide which enables the mechanics to work on the buses in comfort. The wash rack is at the right of the garage just north of the freight-handling section. A gasoline pump inside the front door supplies the buses with fuel from a 500-gal. tank buried under the drive at the left of the entrance.



Bus garage section with gasoline filling station at right in foreground



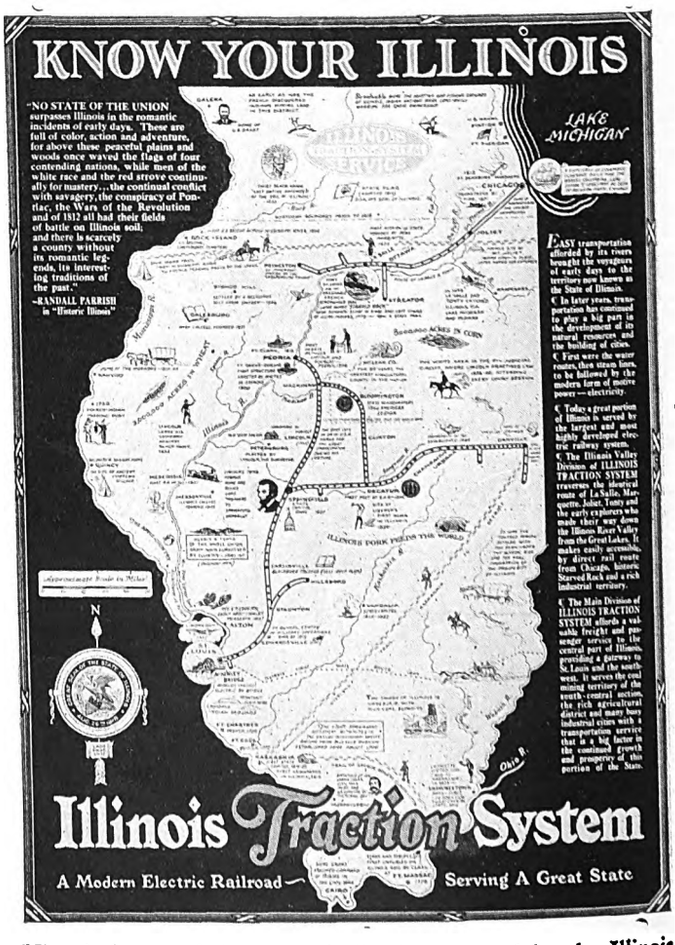
Interior of car storage section of building, showing 80-ft. track pit with heating pipes its full length

Illinois Traction Issues Pictorial Map

MUCH favorable comment has been received by the Illinois Traction System for preparing a map depicting the history of the state it serves. "Know Your Illinois" is the title of the brochure which contains, in addition to the map, a brief outline revealing the high lights of 2½ centuries of the state's history.

The map is in three colors and is 18x25 in. in size. The historic points are indicated by simple drawings and brief text. In addition to the historical facts many industrial facts of the state are given. The routes of the Illinois Traction System are prominently displayed and a brief description of the system's freight and passenger service is entered on the side. In leading up to the description of the service afforded by the system, a brief outline is given of the transportation history of the state from the time rivers were used.

Advance copies of the map were released at the Illinois Public Utilities Association convention in Springfield, Ill., and in a few weeks the company was flooded with requests from individuals, libraries, schools, chambers of commerce and civic organizations. The demand was so great that a second edition had to be printed. Its wide distribution is giving the company much favorable publicity.



Historical map of the state of Illinois, prepared by the Illinois Traction System, that is causing much favorable comment

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Anticipating Economic Changes

By Charles W. Chase
President Gary Railways, Gary, Ind.

Many things can be done by the electric railway to anticipate losses in revenue and provide additional sources from which the gross business may be recruited

This article, based on a paper presented by the author at the summer meeting of the Central Electric Railway Association, shows that there is no need for pessimism regarding the industry so long as there are many ways of strengthening its financial position.—EDITOR.

NO BUSINESS or industry has an assured future, but we find that a courageous, intensive and intelligent effort on the part of those burdened with the responsibility has safely adjusted each industry to changed conditions and enabled it to go on to ever-increasing usefulness and efficiency. This experience of the past and a survey of the present should teach us that though our way may be long and arduous, yet by patience, determination, endurance and the application of every ounce of energy, vision and intelligence we may possess, we can readjust our industry to the shifting current of economic life and competitive business.

It is quite apparent that geographical location has little to do with the answering of this question as to the future of street and interurban electric railways. Given a certain minimum population per mile and communities of a normal character to be served, there would be no question as to the future of the industry in general if motor transportation did not have to be reckoned with. Increasing costs of labor and material involved in rendering transportation can be met, either by reasonable increases in our service charges or through increased mechanical and operating efficiency.

It is certain we do not wish to combat the continued construction of adequate and convenient streets and highways. Sooner or later motor coach competition must be placed upon a fair economic basis, and the users of the public highway as a place of business have to pay an increasing rental in taxes and charges. When paying for its privileges on the public highways, on a fair basis for what is furnished, motor competition will come to an end. On the other hand, enough has been accomplished by individual electric street and interurban railways in meeting this particular menace of motor transport competition to justify belief that the future of any particular property in our industry is going to be pretty much what the owners and management of that property make it, what they do or do not do to affect it, and what measure of ingenuity, courage, perseverance and ability they demonstrate in meeting the common enemy.

Taking stock of our situation, what encouragement do we find? Of one thing we can be assured: The electric railway still stands supreme in the matter of economical, safe and comfortable mass transportation. A cursory study of the traffic reports of our companies and a glance at our streets and highways and the reports of sales and production of motor vehicles furnishes a quick answer to the question: why does the electric railway traffic tend to stagnate or decrease except in the largest cities or in territories where some special circumstances intervene? The conclusion is forced that for an indefinite period we must in general look for little increase in revenues, and that our principal hope of betterment lies in devising ways and means whereby expenditures of operation may be reduced without impairment of necessary or justifiable service.

If we pause for a moment and view the trend of economic affairs since the upheaval of the World War, it is significant that our country's domination of the world's markets is still marked. The foresight and enterprise of our industries in lowering price levels and the mechanization of industry have made this possible. Man power has been supplanted by mechanical power and that labor released for service in other channels. Mechanization of plant has saved many a thriving business from decay or destruction.

GREATER MECHANIZATION OF RAILWAYS POSSIBLE

Everywhere we see the same fierce race to substitute mechanical for man power. This suggests the question as to whether we have been as vigilant and as enterprising in securing to our industry the rewards of all possible mechanization as we could. Much has been accomplished in a sporadic or partial way, but have we adopted this means as a cardinal factor in our equipment to meet the economic pressure now on our industry? What proportion of our properties have adopted the use of one-man cars to such an extent as to increase the car-miles operated 30.2 per cent and reduce the number of operators employed 34.4 per cent and the payroll 4.6 per cent? It will be said that dense traffic conditions will not permit such dependence on one-man operation, yet it has been accomplished during peak-load operation with a headway of as low as a car every 30 seconds, handled by single and double-truck one-man cars and trail trains indiscriminately intermingled. Pneumatically-operated doors with automatic rear exits treadles, electric switches, and block signals have turned the trick, and quick accelerating motors, built and geared for high speed, give more time on the schedules than the two-man car crew had before. A scrapping of old, obsolete two-man equipment for modern high-speed luxurious one-man 52-passenger cars has produced a saving of 26 per cent in the cost per car-mile of operation of the schedules.

Automatic substations with mercury arc rectifiers suggest other objectives, whether fully automatic paying a handsome return in the case of central and main sub-

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stations, or semi-automatic requiring no attendants, and an investment expenditure of hardly more than $1,000 per station.

An unnecessary loss is frequently incurred in layover time on schedules. Great savings can be accomplished by cutting layovers at ends of runs to a minimum. One property has achieved an efficiency of 95.63 per cent in its schedules by eliminating all unnecessary layover time.

Go through your shops and barns, look into the splendid mechanical exhibits at our A.E.R.A. convention at Cleveland and discover how many hands and backs can be relieved by the various labor-saving devices offered and the abundant return you can get on the comparatively small investments required in paint-spraying machines, banding machines, cranes, track and line machines. Encourage your shop employees themselves to devise labor-saving devices and reward the enterprise and initiative of the employee who by his ingenuity effects permanent savings in your operation costs. All of these moves may tend to make the shops look lonesome but they will get the work done and enable us to hold on to some of the dollars we get our hands upon.

Let a skilled business organizer study your accounting and treasury structure, and suggest machines for doing various phases of your accounting work, which will eliminate waste and duplicate effort, man or women power, or stop its increase. One recent merger of the accounting departments of transportation utilities improved the work with a decrease of 20 per cent in employees and 16 per cent in combined payrolls and rentals. Supervisory forces and even officials should not be overlooked. These always tend to become overloaded with positions which, once created, cannot be abolished without drastic action.

In the ways and structures department large results can be obtained by improvements tending to cut down the frequency of recurrent maintenance expenditures. Welding of track enables us not only to reduce greatly wear and tear of equipment, but also to obviate with the aid of light-weight cars a large portion of the necessary number of ties. Thermit welding of track on light interurban and suburban lines with slip joints every 1,000 ft. for expansion has eliminated one-third of the ordinary number of ties on one railway in mind. Steel ties with solid concrete construction (base and pavement) has reduced maintenance labor and costs tremendously on another Middle Western line. Mechanical tampers, the use of long-lived special work and materials, steel wheels with mileage reaching up to 176,000, all offer possibilities of reducing human labor and making savings in maintenance far overreaching the original investment. Other phases of our expenditures offer great opportunities for improving our financial position. Equipment trust notes with comparatively low interest enable many an impoverished property to secure modern cars capable of saving their cost within a comparatively short time by the economy of their operation.

Credit a Prime Requisite

The first requisite for the procuring of the varied economies possible from the use of modern labor-saving appliances and equipment is credit. Without this, progress must be slow in meeting the tide of diminishing return. Credit of the electric railways, as of the steam railroads, depends largely on the balancing of our capital structure. Too many of us are staggering under the load of interest-bearing obligations out of all proportion to the value of our properties, the aftermath of the promotional era. Today, if we expect to survive the wearing struggle, we must put our financial as well as our physical house in order. Owners of securities of properties whose earnings do not justify the load had better face the facts, give up their strangle hold on the credit and opportunities for improvement of such properties and accept adjustment securities, which will balance the financial structure and permit the issue of new securities upon which interest can be earned with reasonable certainty and leave a large margin of safety in excess value of property represented by capital stock fairly divided between preferred and common. Without a restoration of credit we cannot win this struggle; to attempt to stagger along under a load of ill-assorted obligations and securities is suicide for the property and security owners. A resolute facing of the situation and trimming of ballast to meet the storm is only common sense. Failure to adopt such measures will merit the punishment which will surely follow.

Subsidizing of Service Probable

It is more than probable that in the coming years we shall see a certain amount of financial aid given to the electric street railways in the form of indirect subsidy. It should be possible to finance necessary extensions of street railways to outlying suburban territory, or wherever their extensions are desired, by the method of special assessments just as other public improvements are paid for. Legislation should be enacted permitting districts to construct and pay for street railway extensions by special assessments of the property benefited, with appropriate leases of the extension to the operating company. The tremendous increase in property values accompanying a permanent form of transportation is abundant justification for property owners and real estate developers desiring such legislation. Safeguarding our revenue from piratical forays of mushroom motor coach and truck lines must engage our most anxious consideration. Experience shows that motor coaches can succeed financially only by the comparatively cost-free use of highways built at the expense of property owners and the general public. Only on especially favored routes of traffic density can such operation economically survive. The experience, however, is gained at tremendous cost to the electric railway as well as the motor transport competitor. While the acquisition of competing motor coach lines by the electric railways has generally only piled one loss upon another, yet it seems better to establish a skeleton coach service, reducing the loss to a minimum, than to permit the leech-like competition upon our best routes. On the other hand, motor coach service co-ordinated with the electric railway, has been successfully effected in many instances, saving the electric line large investments in doubtful extensions and taking care at a minimum of capital and operating cost of the demands of sparsely-settled suburbs and territory for transportation service.

There will undoubtedly be a considerable development and increase of revenue for many interurbans from the transportation of freight whether through interchange with steam and electric carriers or as complete transportation lines with freight terminal facilities in outlying portions of the cities served, where pickup and delivery can be accomplished by the use of motor trucks operated by local truckers or the electric railway itself, or by truck and carrier containers such as are being experimented with at present.

That traffic now using automobiles and motor trans-

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portation can be induced to return again to the electric railway has been abundantly and lately proved by the successfully rejuvenation of some of our electric railway lines in the Middle West. On one road there has been a complete rehabilitation of ways and structures together with a complete reorganization of physical, financial and operating structure which in two years has resulted in an increase in passenger revenue of more than 150 per cent and in freight revenue of more than 200 per cent. This transformation has been worked out alongside of parallel hard roads carrying an intensive motor coach and automobile traffic and also in the face of formidable steam railroad and motor truck competition. It has demonstrated that speed, comfort and frequent service with an aggressive campaign for traffic can induce people to put aside their automobiles, forego motor coaches and steam railroads and travel the electric way.

The Future Is What We Make It

We have a concrete illustration of two electric street railways in adjoining cities of the Middle West of about equal size. In ten years on one line no single change has been made in method of operation with the result that today its public relations are ruined, its employee morale shattered, and its lines paralleled with a competing motor coach service far more extensive than the electric railway service. Its earnings have for years been decreasing and its property going into physical and financial decay with a general loss of credit. The other railway has extended its rail lines to meet justifiable traffic needs, protecting its property by supplementing and co-ordinating its rail service with motor coaches, and has either controlled or driven off motor coach competition by supplying the service itself. This railway, during the same period, has completely rehabilitated its property, operates speedy, light-weight, one-man cars with comfortable upholstered seats, on both city and interurban lines, has installed mercury arc rectifier and automatic substations, has completely reorganized and balanced its financial structure, pays about the highest rate of wages in the country, and as a result of all this since 1924 has increased its gross earnings 23.3 per cent, its net operating revenue 30.6 per cent and has paid dividends of 7.2 per cent on its preferred stock for the past three years. Its employees are all stockholders, as are hundreds of its patrons, and the property stands in the front rank of all movements for the welfare of the communities it serves. These opposite results have been accomplished under identical conditions and with similar opportunities. They are illustrative of the thought that the future of our industry is what the individual property makes it.

Other present-day experiences suggest means of bettering our condition. Merchants, when trade languishes, do not hesitate to adopt drastic remedies to attract business; low prices bring the shoppers to the counters in the poorest times. Why not try some of this in our industry? May not business and living conditions in this country have reached that point where it may be better for us to attempt to meet such conditions and fill our empty seats by establishing attractive prices for our wares than by further choking off traffic by continued increase of rates? Illustrations of the wisdom of this are not wanting. In two Texas cities of more than 150,000 people each, the weekly identification pass card at 40 cents with a 5-cent fare on each ride, with three tickets for a quarter, has produced an increase of 15 per cent in revenue. This same plan has been successfully used in several other cities and seems to satisfy all classes of traffic. Other properties have adopted the Sunday pass, good over all their lines, at the absurdly low rate of 25 cents, for which riding up to $2.65 worth is permitted, with the result that a net additional revenue of $10,000 per annum is already being earned, and Sunday riding restored to its former popularity. Another electric railway in the Middle West, by a reduction of 50 per cent in rates on one motor coach route 22 miles in length has trebled its traffic, reduced its expense per mile and made the route profitable.

There may be many properties, and we observe some from day to day, whose operating situation, traffic possibilities, competitive conditions and the limited population served may not warrant the continuance of the struggle with motor competition and whose wisest course may be to discontinue rail operation and avail themselves of the public's offer of cost-free highways to substitute motor service for their rail service, increasing at the same time the rates of fare and securing all available traffic between terminals. With limited traffic there is little use in trying to furnish the public with two classes of service between the same points. However, in territories of rapid growth or large population, it seems certain that if the electric railway service can be nursed through a period of years time will erect a protecting shield about it, traffic congestion and road taxes will strangle or retard motor competition and the electric railway again strike its normal rate of growth proportionate to that of the community served.

Electrification of Southern Railway in England

SPEAKING recently before the Institute of Transport, London, E. C. Cox, chief operating superintendent, Southern Railway of England, explained that the work of conversion of the single-phase system used on that line to third-rail direct current would be completed early next year. The company's single-phase system was installed about twenty years ago. Since then, some 49 route-miles of suburban line on what is now a part of the Southern Railway System was equipped with direct current and third rail. The desire to have a uniform system led to the conversion now taking place. When completed, the total route-miles of the Southern Railway electrified sections will be 255¾, embodying 875 track-miles. The total cost of electrification is set at £11,500,000.

Department Store Refunds Fares During Sale

CO-OPERATION between the Gary Railways, Gary, Ind., and a large department store of that city during a two-day sale of the store brought many customers. The store refunded the round-trip street car or bus fare of each customer who purchased $5 worth of goods or more, and the railway, for its part, provided additional service.

Conductors on five street car lines and on all the buses of the company gave slips to the riders as they boarded the vehicles. Refunds were secured by presenting these slips at the store with sales slips showing the required amount. No mail, telephone or C.O.D. orders were accepted and the sale was extensively advertised, so that a great many people availed themselves of the transportation facilities.

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Maintenance Methods and Devices

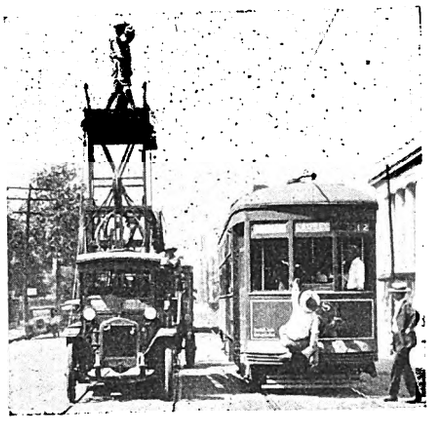
Economical Method for Renewing Trolley Wire*

By M. M. Watkins
General Foreman Railway Distribution New Orleans Public Service, Inc., New Orleans, La.

RENEWAL of trolley wire on the lines of the New Orleans Public Service, Inc., is done by a convenient and economical method. The regular tower trucks, which are in daily use on maintenance and construction work, have the tower set back to the rear of the truck a distance sufficient to allow the placing of an upright with two wooden pulley guide wheels between the cab and the tower.

When trolley wire is to be renewed a reel with a mile of trolley wire is placed on a two-wheeled gig which is hauled by the truck. The trolley wire is then threaded under the lower guide wheel, and up and over the upper guide wheel, back over to the tower and then is connected to the live trolley wire. As the truck moves along the street the trolley wire is tied up at each span in the regular manner. When a car approaches the truck simply pulls to the side of the track. After the car has passed, it again swings back to the track and work is resumed.

By this method a crew of seven men renew trolley wire at an average cost of $0.008 per foot. This is accomplished with cars operating over the line during the daytime without interrupting their schedules. This method has the additional advantage of eliminating a heavy and unnecessary investment in automotive equipment.



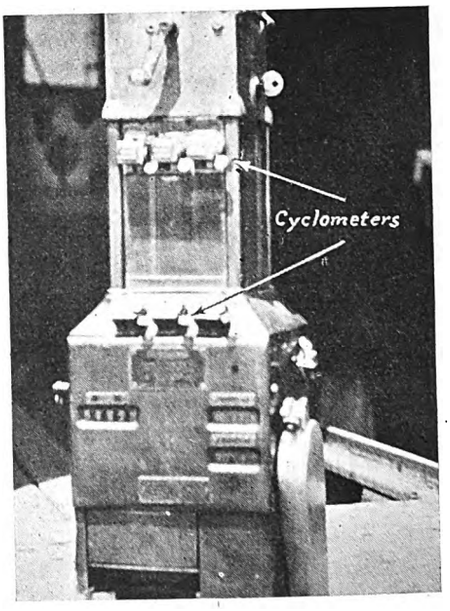
Service is not interrupted in the stringing of trolley wire as the truck pulls to one side to allow cars to pass

Cyclometers Used on Fare Boxes*

By Charles Herms
General Foreman San Diego Electric Railway, San Diego, Cal.

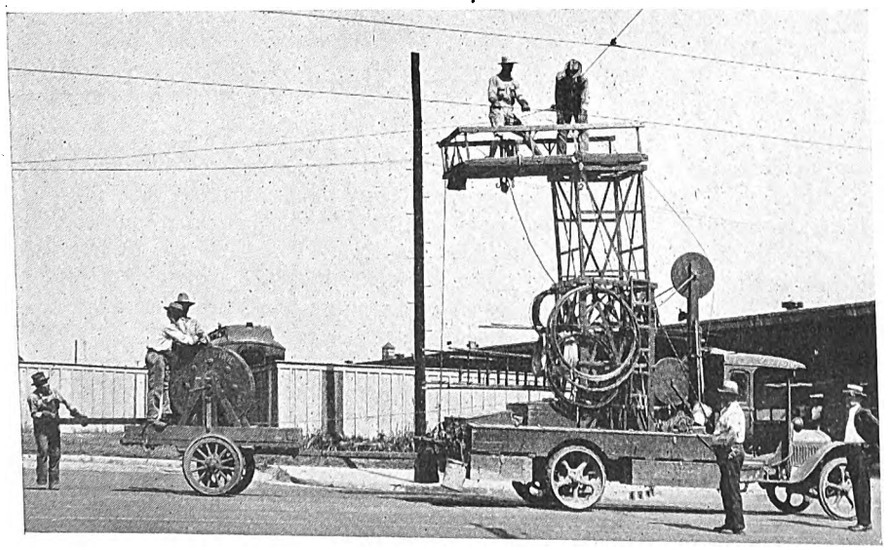
MANY different forms of fares are collected on cars operated by the San Diego Electric Railway. These include, among others, a weekly pass, school pass, transfer and 5-cent fare. The counters are not used to check fares, as the fare box takes care of cash collected, but counters are used as a means of checking daily passengers so as to register the number of each class hauled. They replace the overhead registers, which were unsightly because of the cords and hangers dangling in the car.

Cyclometers are easily attached to the fare boxes and are considered quite essential for one-man cars where silent registration is desired, and where several types of fares must be collected. The cyclometers are fastened to the fare boxes by drilling holes through the housing and fastening them by means of No. 6 round head machine screws ⅜ in. long. The nut and washer are on the inside of the fare box.



Fare box with six cyclometers installed on it for checking passengers

In the accompanying illustration the fare box is shown equipped with six cyclometers. The three at the top of the glass inspection chamber are fastened by cutting out the glass to the necessary width for mounting. A piece of sheet metal is inserted in its place and the cyclometers are fastened to it. A metal plate wide enough to allow ½ in. over the cyclometer is used on which is stencilled, with ⅛ in. letters, the purpose for which each counter is to be used. Words are abbreviated, as weekly pass, W. Pass; School Pass, S. Pass, etc. The plate for the three lower cyclometers is made of No. 22 gage brass, inserted



Method of renewing single trolley wire used by the New Orleans Public Service, Inc.

*Submitted in Electric Railway Journal Prize Contest.

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inside the inspection chamber between the glass and the corner post.

Each counter has a small key, on the right-hand side, similar to a typewriter key. The counter has a stop so that only one number registers at a time when the key is struck. Counters are very compact and reliable, and little trouble has been experienced with them.

When the operator takes out a car in the morning he records the reading of all counters as well as the fare boxes. When he is relieved he takes another reading and so does the relief man. This is repeated every time crews are changed.

Combination Air Compressor and Street Crane*

By F. J. Martin
Superintendent of Maintenance
Pittsburgh Railways, Pittsburgh, Pa.

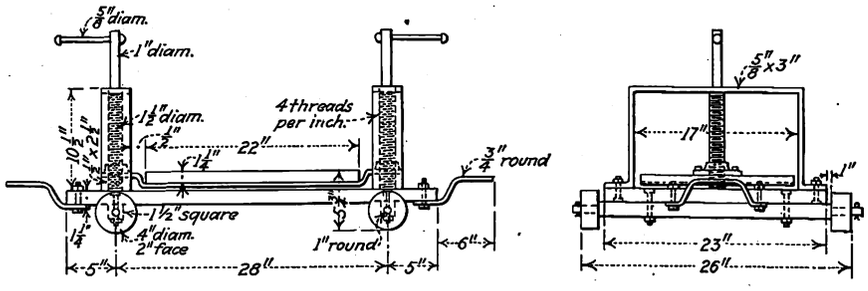
BY THE combination of several standard units, purchased from manufacturers, the Pittsburgh Railways has assembled a machine to reduce track maintenance labor. This has resulted in faster and more economical work and quicker transportation of equipment to the various jobs. Track gangs are able to move to various locations, start and complete two or more minor repair jobs in a nine-hour day with less men than were used formerly. The use of this equipment has also resulted in another element of safety, in that it removes the hazardous work for track men by being equipped to lift from or into the track area all rail and special work, regardless of type, which formerly was done by hand labor in small jobs or required the use of a road crane in jobs of larger magnitude.

The machine consists of a runabout type of air compressor mounted on rubber-tired wheels. It is capable of traveling 20 m.p.h. The compressor has a capacity of 110 cu.ft. Two of the latest type of concrete breakers can be run satisfactorily. They are used for removing concrete from around the rail when it is replaced. The equipment has a 7-ft. crane with a pneumatic hoist, instead of other mechanical lifting devices. The crane is able to lift 2½ tons.

*Submitted in Electric Railway Journal *Prize Contest.*

Truck for Handling Air Compressors

REMOVING or installing air compressors on cars without proper accommodations was always slow and tedious in the 96th Street shop of the New York & Harlem Railroad, New York, N. Y., until a special truck was designed. Often all of the pit space was occupied and compressors had to be removed and reinstalled quickly to avoid holding a car out of service for any great time. The truck designed for this work is shown in the sketch reproduced.

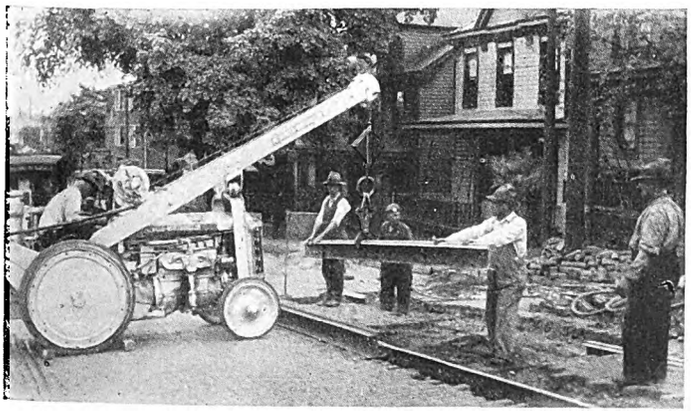


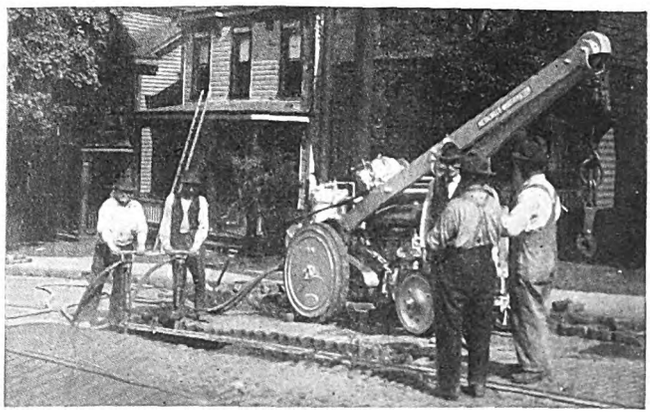
Handy truck for removing and installing compressors under cars

An oak platform 38 in. long by 23 in. wide of 1¼-in. lumber is bolted to two square axles spaced at 28 in. centers. These axles are mounted on solid iron wheels. Two U-brackets are bolted to either end of the platform over the axles. These brackets are 10½ in. long by 17 in. wide, and are made of ⅝x3-in. stock. The top of each is drilled for the centering and guiding of the top of an adjusting screw. The bottom of the adjusting screw is fitted into a threaded casting riveted to a ½-in. plate extending across the entire width of the bracket. A similar plate bolted to the platform acts as a lower guide and bearing for the adjusting screw. A movable oak platform 28x16 in. in size is mounted on two ½x3-in. bars, the ends of which rest upon the cross plates fastened to the end of the adjusting screws. Turning the adjusting screws to the right or left raises or lowers this platform. There is a guiding handle on either end of the stationary platform. It will be noticed that the movable platform is only 5¾ in. above the floor level, so that the truck can be placed under a compressor cradle when the car is not over a pit. When the truck is in position the platform is raised by operating the adjusting screws until the cradle is lifted enough to allow for the removal of its supports. Then the platform is lowered.

A Chuck for Different Sized Bearings

BORING of bearings has been simplified greatly in the Tompkinsville shop of the Richmond Railways, Inc., Staten Island, N. Y., through the use of a special lathe chuck. Previously a separate chuck was used for each size of bearing. It was





At left—Crane lifting rail into position. At Right—Air compressors supplying air for the operation of two concrete breakers

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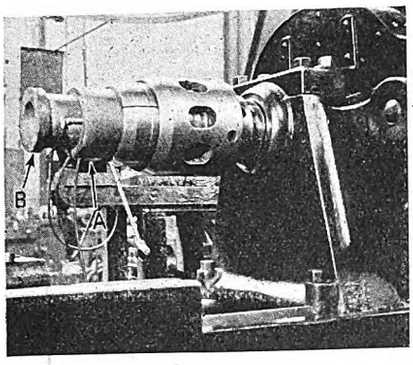


Bearing and adapters partially entered in chuck

found that these chucks had served their usefulness. After careful consideration it was determined that it would be more economical to scrap the old chucks and procure one chuck suitable for all sizes of bearings. A chuck designed to take the largest bearing which would have to be rebored was procured. Sets of cast-iron adapters were made up of the proper thickness to be used between the chuck and the smaller diameter bearings. These adapters were made up in pairs and numbered to correspond to the particular type of bearing with which they should be used. The accompanying illustration shows the chuck in position on a lathe, together with a pair of adapters, *A*, and a small diameter bearing, *B*, partially entered in the chuck.

This arrangement has simplified the boring process, increased production and eliminated the necessity of having more than one chuck for the boring of all bearings.

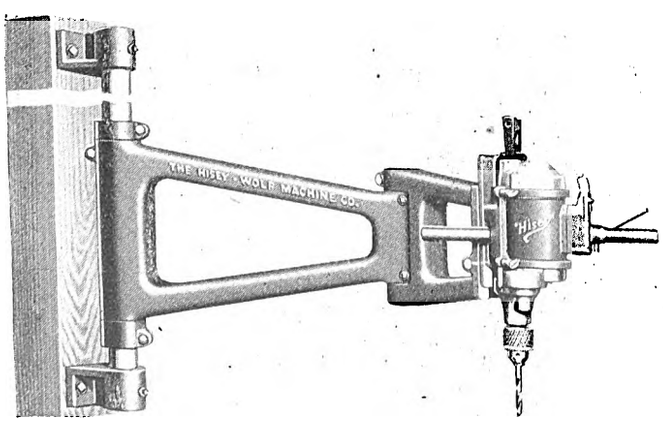
New Equipment Available

Radial Arm for Portable Drill

MEANS of supporting portable electric drills by a radial arm mounted on ball thrust bearings is announced by the Hisey Wolf Machine Company, Cincinnati, Ohio. This mounting will support all Hisey drills up to and including the $\frac{7}{8}$-in. capacity.

The lever feed is through a rack and pinion the same as a drill press, thereby permitting a positive and sensitive control without fatigue to the operator. The motor holding brackets are designed so that the portable drill can be attached without removing any parts of the machine.

It is stated that this feature is a great time saver and a protection against loss of parts. By means of the individual swivel clamps either the long or short arms can be locked independently, whereas, if the work requires, both arms can be locked in any fixed angular position.

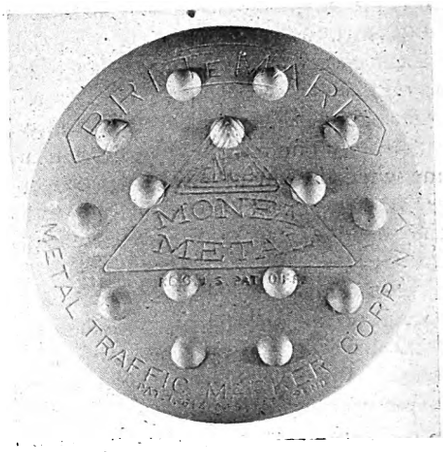


Double radial arm for mounting portable electric drills

Monel Metal Traffic Marker

FOR the marking of safety zones, of turns to show clearance lines for car swing end over traffic lanes, station platform guard lines, storeroom floor subdivisions, shop traffic lanes and every other floor or road marking requirement of the electric railway, the Britemark Monel metal traffic markers have been developed by the Metal Traffic Marker Corporation, New York, N. Y.

They are made with a soft heat-treated malleable iron base, which includes a stem with prongs which on installation spread out, giving a permanent anchorage. This base is sheathed in a top made of heavy gage Monel metal, rolled over the edge of the iron base so that it will not become detached. It is stated that the markers may be installed easily and cheaply in asphalt, concrete, brick, granite block, wood, creosote block or any other kind of pavement at any time of the year, either while the pavement is being laid or after.



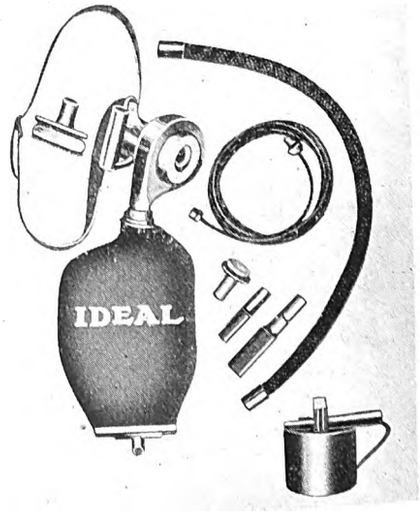
Top view of one of the metal markers

They are slightly dome-shaped, which enables them to reflect light in all directions and to be visible easily. When installed the crown projects approximately $\frac{1}{2}$ in. above the paving so that it will not interfere with traffic.

The Britemark marker is made in $1\frac{1}{2}$ in., $2\frac{1}{2}$ in. and $3\frac{1}{2}$ in. diameters.

Improved Portable Electric Blower

FOR WORK where compressed air is not readily available, but where electrical connections can be made, an improved construction for the Ideal portable electric combination blower and suction device is announced by the Ideal Commutator Dresser Company, Sycamore, Ill. The motor is a unit with this equipment and the opening and closing of the circuit is done at the handle grip. Recent improvements in the combination have made possible the addition of suction attachments.



Attachments for electric combination blower and suction device

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Association Activities

Progress the Theme of Southern Maintenance Men

Electric Railway Association of Equipment Men, Southern Properties, has enthusiastic meeting at Cincinnati. Need for improvement in maintenance thinking brought out

NINE papers, whose subjects included the whole field of railway and bus equipment maintenance, made up a full program for the first day of the meeting of the Electric Railway Association of Equipment Men, Southern Properties, held in Cincinnati, July 25-27. This was the fourteenth semi-annual gathering of the association, which in the seven years of its existence has grown from four to nearly thirty properties. It was also the first meeting to be held in the Central states. Some 200 attended the sessions, including representatives from Baltimore, Kansas City, Pittsburgh and other properties beyond the original boundaries of the association. By vote of the executive committee, announced Wednesday, the association's membership, with the exception of those properties from other sections already affiliated, must be confined hereafter to the original territorial limits.

President Robert M. O'Brien, who presided at the meetings, in his address opening the program Wednesday morning, emphasized the need for applying engineering methods to the solution of modern transportation conditions. He prefaced Wednesday afternoon's program by calling on C. L. Van Auken, managing editor *Electric Traction;* Leonard Church, assistant editor ELECTRIC RAILWAY JOURNAL, Chicago, and F. J. Foote, president Central Electric Railway Master Mechanics Association, all of whom took the opportunity to express themselves on the work of the Southern Association.

MASTER MECHANICS SHOULD PROGRESS

While electric railways have improved their public relation functions greatly, have created and are developing the new art of merchandising transportation, and have reduced the operation of their services to almost an exact science, they have not, according to Myles B. Lambert, transportation sales manager Westinghouse Electric & Manufacturing Company, fully recognized and appreciated the importance of the master mechanic. Perhaps the reason why more rapid progress has not been made in evolving the kind of street car that the railway industry needs to place it on a more profitable and satisfactory basis, said Mr. Lambert, is because the master mechanic has not stepped along with the times. and has not occupied the place in the councils of the industry that he justly deserves. There are those who believe that many of the recent troubles of the street railways would have been avoided had the managements of fifteen years ago recognized that the master mechanic held the most important and responsible position of any department head in the system. If he had received this recognition; if his job had been made more attractive; if he had been properly supported and assisted; if, in a word, he had been a real power in the industry, the speaker held that he would have responded more readily to the change in transportation demands brought about by the automobile and would not have allowed the development of the street car to stand still while business rolled by it on rubber tires.

Fortunately, comments Mr. Lambert, the master mechanic's job is rapidly evolving into its rightful proportions. Fully developed talent is, of course, scarce because of past practices, and another ten years may be needed to train a sufficient number of skilled engineering and executive master mechanics or superintendents of equipment adequately to serve the industry. Only by continuing to develop a broader concept of their job and by the exercise of aggressiveness may they secure for themselves the necessary facilities for handling the work, or persuade their managements to do what is essential to enable them to function efficiently. However, the master mechanic must acquire a wider vision of his vocation. If he is really the "master" of mechanical car service for his community's railway system he must realize that the great majority of all people in that community are looking to him personally for their major transportation service, and that the entire business and social structure of the community are vitally affected by the type of cars and service he provides.

Mr. Lambert urged the association to embrace a definite program toward evolving the kind of street car the industry needs. As a first step in this direction he suggested the appointment of a committee of the association to review all cars exhibited at the coming convention in Cleveland and report on the best all-around designs, or combination of designs, displayed. Another step suggested was to have a committee prepare a word picture of what would constitute the ideal modern car, covering such items as acceleration rates, braking rates, seating arrangements, weight of car, wheel size, axle size, etc., keeping in mind that the differences in opinion on car design on the part of master mechanics has presented one of the most difficult and expensive problems that car builders and equipment manufacturers have had to contend with. Do not forget, said Mr. Lambert, that we shall not cure our present traffic ills entirely through regulation, restrictive parking laws, street widening, rerouting, etc., but by providing a mass transportation superior to any other form of transportation. Special attention was called by him to the address by E. J. McIlraith, staff engineer Chicago Surface Lines, before the Canadian Electric Railway Association and published in ELECTRIC RAILWAY JOURNAL for June 23.

EMERGENCY SERVICE CENTRALIZED IN CINCINNATI

The Cincinnati Street Railway, in an effort to improve the regularity and dependability of operation, has centralized the control of emergency service in a dispatcher's office manned by three dispatchers, each on an eight-hour shift, covering the full 24 hours, according to Joseph Ong, transportation engineer. The service on the street is in charge of a uniformed force of supervisors who are stationed at specific points where they can watch the movements of the cars on several lines. Each has a looseleaf book which is distinctive because: (1) It shows the exact time of all cars due at the point for which the book is prepared, permitting quick check-up of "on-time" operation; (2) it shows the relative position of all cars using common track, permitting a quick check-up on the movements of cars with reference to each other; (3) the form is condensed so that one double page covers an hourly period; (4) in looseleaf form page replacements can be made readily; (5) corrections for schedule changes on any line are easily made without disturbing the record of cars on other lines. Mr. Ong described in some detail the new arrangement of the company's telephone system, which centers in a private branch exchange with trunk lines to the Bell Telephone system.

There are nine operating divisions on the Cincinnati street railway system with a carhouse located in each division. At five of these, motor trucks are kept for emergency service. At a sixth location just outside the congested downtown area is located an additional emergency truck. In handling this emergency service with automobile

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trucks instead of wrecking cars Mr. Ong said it was found the trucks could more quickly reach the scene of the trouble, resulting in much time saving. In addition to the emergency service trucks three regular line trouble trucks are located advantageously about the city. All line trouble trucks are manned by linemen, and only those located at headquarters can be used for other work between calls. This elaborate system of trouble and emergency service is under the control of the dispatcher's office, which serves as a clearing house for information for all of the officials of the company, as well as centers authority for action in emergencies.

In discussing the place of the bus in urban transportation V. W. Berry, assistant general manager Virginia Electric & Power Company, traced the development of this type of transportation from its advent on the west coast in the latter part of 1914. While the bus has a place it has its limitations and will not supplant the electric railway as a principal transportation agency in urban communities. On the other hand, if the electric railways are to continue successfully as the principal transportation agency they must recognize the field for buses and supply that service. Otherwise, it will be furnished by independent operators, much to the disadvantage of and at a serious loss to the electric railway. The principal condition affecting the success of urban transportation systems today is, according to Mr. Berry, the competition offered by the extensive use of the private automobile. The use of buses in urban centers during the past few years has proved that they are generally subjected to the same competition as the street car. With the ever-extending use of the private automobile, public transportation has become a highly competitive business, requiring the same degree of skill in salesmanship as any other business having competition to meet.

Meeting Competition

In his paper, "What Are You Doing to Meet Competition?" E. P. Waller, manager railway department General Electric Company, likened the electric railway, steam railway and bus operating companies to manufacturing companies producing transportation as a product and selling it to the public at a fixed price. Figures from a survey made by Electric Railway Journal some two years ago of the age of street cars in service in the United States were cited to show that upward of 40,000 street cars in daily service are now obsolete; are, in fact, so inefficient and so expensive to maintain that it is little short of a crime to run them. Modern equipment will, according to Mr. Waller, do more than affect the operating cost, for quieter cars, better looking cars, more comfortable cars and faster schedules appeal to the public and unquestionably bring more riders. Assuming that the substitution of new cars will bring in only 5 per cent increase in gross, this will, in many cases, result in a net profit instead of a loss. Modern equipment permits the fastest schedules with new light-weight cars even when run with one man, and the later designs readily lend themselves to the use of one man instead of two in all classes of service, city, suburban and interurban. To the direct economies of one-man cars, there should be added the savings due to running a small number of cars for any given headway, and the increased riding that usually follows improved schedules.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Aug. 16 — Metropolitan Section, American Electric Railway Association, fourth annual outing, Luna Park, Coney Island, N. Y.

Aug. 16-17 — Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.

Sept. 7—Maryland Utilities Association, mid-year meeting, Braddock Hotel, Braddock Heights, Md.

Sept. 7-8—Central Electric Traffic Association, Potawatomi Inn, Angola, Ind.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

Sept. 25 — Central Electric Railway Master Mechanics' Association, Cleveland, Ohio.

Oct. 1-5—National Safety Council, safety congress, New York, N. Y.

Oct. 8-12—American Welding Society, fall meeting, Philadelphia, Pa.

Nov. 14-15—Public Utilities Association of Virginia, Roanoke, Va.

Carbon Brush Development

While the carbon brush may be given credit for the success of electric railway service, a large share of credit for progress in the development of carbon brushes must in turn be given to the experience gained in electric traction, declared W. C. Kalb, National Carbon Company, Inc. In the order of their relative importance, the requirements placed upon a brush for railway service are: (1) maintenance of commutator surface at minimum cost; (2) keeping within normal temperature limits; (3) brush life. While commutator maintenance per car-mile is small today, still it is an item of major importance and is influenced to a large extent by the characteristics of the carbon brushes. Abrasiveness must be avoided but the brush must be sufficiently hard to polish the commutator surface and sufficiently strong to withstand the mechanical stresses. Low friction is important, not only to maintain temperature within the desired limits, but also to prevent chattering of the brushes with resultant breakage. Long brush life is a result rather than a characteristic. Good commutation and freedom from chattering are important factors in obtaining long brush life, while hardness and mechanical strength have a secondary influence.

Side wear in certain types of motors becomes a limiting factor in brush life. This problem is so serious on some installations that it has lead to a great deal of investigation. Side wear results from three distinct causes: vibration of the brush, abrasion from dirt drawn into the motor, or burning due to arcing between the brush and the side of the brush-holder box. While the present trend in railway motor design is toward small-diameter motors of high angular velocity with compound or worm gearing, Mr. Kalb concluded that no need has yet appeared for a radical change in the types of brush.

Comfort Is Required To-Day

R. L. Wommack, superintendent railway department Southern Public Utilities Company, Charlotte, N. C., in discussing modernizing street railway equipment, recalled the earlier days of mass transportation when a ride on any kind of an electric car was considered almost an excursion and was sought and enjoyed by the entire family. The advent of the automobile with its easy riding springs, its deep cushions and luxuriously upholstered seats has had the very natural effect of making the public dissatisfied with the kind of accommodation formerly furnished by the street railway. Speaking from experience derived on his own property he said that it had been giving an alternate five-minute service on one line with a small safety car and a 40-passenger double-truck car. Patrons purposely allow the small car to pass and wait for the larger and more comfortable one. In the opinion of Mr. Wommack, money spent in rebuilding old equipment in an effort to modernize it is, with few exceptions, just that much money and time unwisely spent and a valuable opportunity sacrificed to create good will on the part of the patrons for the service.

A paper presented by A. T. Clark, superintendent rolling stock and shops, United Railways & Electric Company, Baltimore, Maryland, detailed the development of the articulated car on the Baltimore property. References were made to detailed drawings of the different types of cars studied prior to the development of a sample car in Baltimore. The use of 34 articulated cars in Baltimore has made it possible to save the wages of two men per unit, totaling approximately $3,000 per car per year. With high power and use of pay-pass fare collection, it has been possible to increase the schedule speed about 25 per cent. The motorman likes its quick front-end loading, enabling him to move with the traffic signals. The conductor favors the car because the passengers pay as they pass through the steel drum connecting the bodies. The passengers favor it because it gets under way quickly, is speedy and can be boarded

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rapidly in inclement weather. With only four motors as compared to eight, one air compressor as against two, and with other duplication eliminated, the maintenance cost is reduced about 30 per cent below that of two standard cars. It is true, admitted Mr. Clark, that these cars represent older cars reconstructed. Every advantage and more, can be obtained from new cars built from new material. The 34 cars in Baltimore have run a grand total of more than 3,000,000 miles, so that the car is no longer considered experimental.

More Than Half the Railways Now Run Buses

Recent reports indicate that more than 50 per cent of the street railways in the country are now operating some bus service, according to L. McInerny, master mechanic San Antonio Public Service Company, in his paper on bus maintenance. The continued purchase of buses by the street railways insures that bus maintenance is, or soon will be, a problem for the majority of electric railway maintenance men.

Effective bus maintenance appears to Mr. McInerny to be based on these five requisites: capable mechanics, an accessible supply of standard repair parts, modern and ample shop facilities, a definite and predetermined inspection, lubrication and overhaul schedule, and finally, an effective supervision through accurate and graphic records. This paper will be abstracted in an early issue of the JOURNAL.

Interesting Shop Men in Their Work

In discussing the co-ordinating of shop equipment and man power, E. J. Jonas, superintendent of equipment Cincinnati Street Railway, believes all will agree that the average workman is willing not only to give an honest day's work, but also to feel that he is a part of the organization that is successfully executing the functions for which it is set up. With this thought in mind the Cincinnati Street Railway has endeavored to lay out a repair shop in which the men could work to best advantage and under conditions that are healthful and pleasant. The next step has been to co-ordinate the efforts of the workmen to reduce waste of material and loss of man-hours to a minimum.

"We believe," continued Mr. Jonas, "this can be accomplished only by interesting the men in their work and educating them in the particular tasks they have to perform. All carhouse and shop foremen are urged to look upon their work as resembling that of manufacturers' salesmen selling car equipment to the transportation department of a street railway. Foreman conferences are held once a month with an average attendance of 30. These meetings have been found so satisfactory that weekly conferences of smaller groups have been established." The procedure followed at one of these group conferences was outlined in the April 14 issue of the JOURNAL. Mr. Jonas outlined briefly the time study and cost record system established at the new Winton Shops of the company and discussed some of the improved car handling methods which have been inaugurated recently.

Pittsburgh Car Tests Described

Comparative tests recently made on street cars in Pittsburgh formed the basis for the paper by W. A. Keller, supervisor of methods Pittsburgh Railways. The thing which was as important as any in bringing about the tests was the desire to speed up the service. The tests included braking with varying loads, air pressures, and speeds; dynamic braking and combinations of air and dynamic braking for several types of trucks; acceleration tests with varying loads, notching rates, and grades; determination of balancing or free running speed; drift runs to determine the coasting and train resistance values of various equipments; special tests on oiled rail to investigate the efficacy of sanding rails; checks of schedule speed over actual routes for different types of cars, number of stops and loads; determination in service of motor temperatures, and service data under severe peak load conditions; and adjustment of experimental equipment on special cars.

The Thursday program provided ample opportunity for animated discussions, since it was devoted specifically to a consideration of questions submitted to the meeting. A banquet Thursday evening gave the social touch to the convention, while inspection of the new shops of the Cincinnati Street Railway, Cincinnati Car Company and works of Tool Steel Gear & Pinion Company occupied the major portion of Friday morning's closing session.

The Compilation of Car Schedules*

The various factors, such as time checking, speeds, running times, layovers, car loading and staggered hours are considered, with examples from European practice

By M. De Barquin
Staff Engineer Brussels Tramways, Brussels, Belgium

RUNNING cars on schedule necessitates a time standard. Some companies have electrically regulated clocks at their carhouses and at other important points. Other companies regulate their own clocks. In Brussels the practice is for an inspector, between 6 and 6:30 a.m. and between 3 and 3:30 p.m. each day, to set his watch in the city by a standard clock, which is regulated from the National Observatory. He then telephones the official time to all carhouses, substations, shops and route terminals so that the clocks there have the exact time. The inspectors, conductors and motormen take their time from these individual clocks.

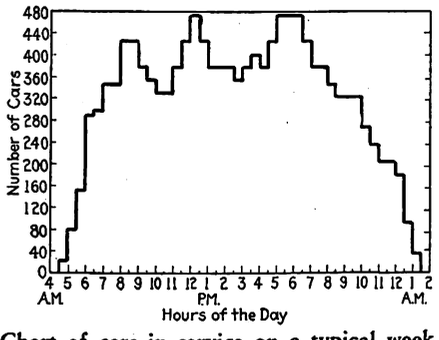

Chart of cars in service on a typical week day indicating the distinct noon peak, Brussels

Most companies base their car schedules on the same running time per trip throughout the day, though a few allow different running times for rush hours and slack hours, but with all, the running time per route differs with the conditions. In Paris the practice is to determine first the normal running speed for each line, independent of the extent of street traffic. This is done by running a car over the route in the middle of the night, when congestion is least. A plot is then made of the route to scale, with the location of all switches and crossings, curves and their radii, stopping points, etc. Each run is then divided into a number of sections, some short and others long, in which the schedule speed is affected by some permanent factor. To each of these sections the schedule maker then applies the normal maximum speed possible as determined by the trial run, but modified by the various factors shown on the chart for each section. The result is the minimum time necessary to make the trip, and the maximum speed possible in each section. This gives what is known as the "standard run." The time thus obtained is checked by a trial run in the presence of a transportation engineer of the company.

In Brussels three running times are used. The fastest is before 7:15 a. m. and after 8:30 p.m. The slowest is between 7:15 and 9:30 a. m. and between 11:30 a. m. and 7:30 p. m. The medium speed rate is between 9:30 and 11:30 a. m. and between 7:30 and 8:30 p. m. There is a distinct noon traffic peak in Brussels, as will be mentioned later. On Sundays and holidays, the fastest running time is continued up to 9:30 a. m. and the medium running time is used after 9:30 a. m., except on a few crowded streets where the slow running time goes into effect at 9:30 a. m.

**Abstract of paper presented at the biennial meeting of the Union Internationale de Tramways, de Chemins de fer d'Intérêt local et de Transports Publics Automobiles, held in Rome, Italy, May 6-12, 1928.*

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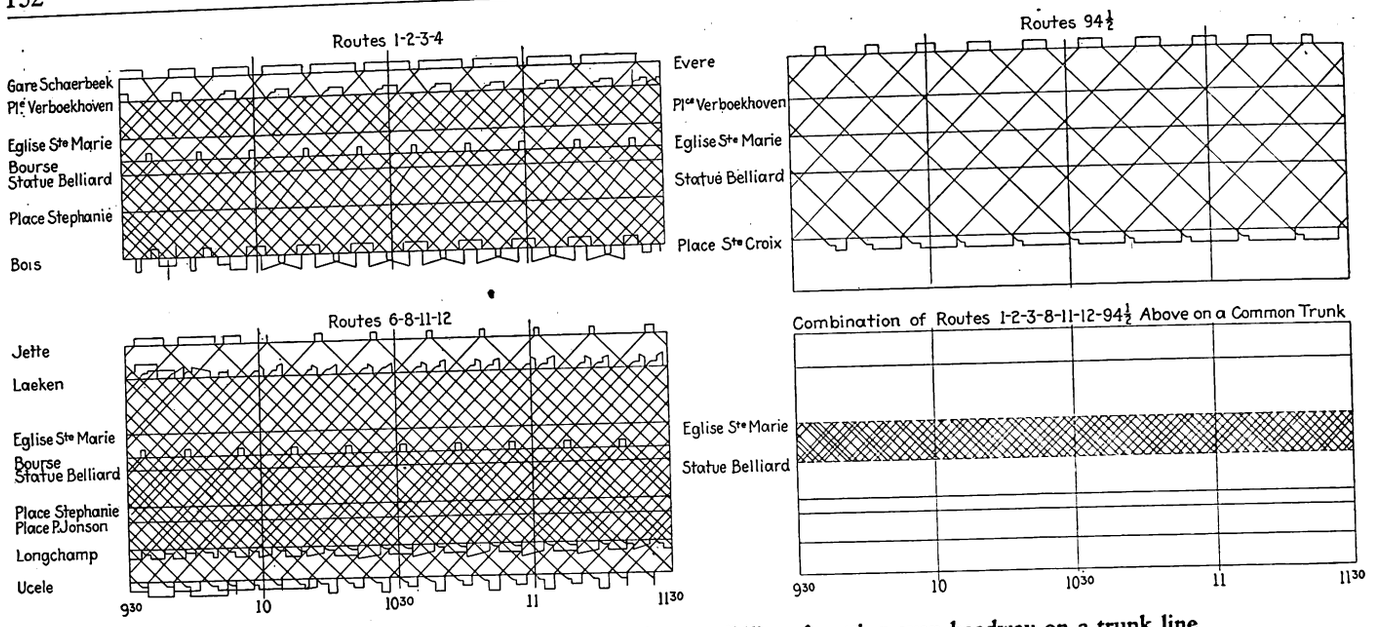


Typical graphical time tables in Brussels, showing possibility of getting even headway on a trunk line served by several individual routes

In the Department of the Seine, in which Paris is located, the following are some of the controlling factors, with the maximum speeds used in these calculations:

Straight track at intersections, 12½ m.p.h.; between intersections, 18½ m.p.h. (In the suburbs on reservations, speeds up to 28 m.p.h. are permitted.)

On curves with a radius of 82 ft. and less, 5 m.p.h.; with a radius from 98 ft. to 164 ft., 9½ m.p.h.; with a greater radius, 10 m.p.h.

On ascending grades of more than 3 per cent, 10 m.p.h.; on less than 3 per cent, the same speed as on the level.

On descending grades from 2 to 3 per cent, 10 m.p.h.; from 3 to 4 per cent, 7½ m.p.h.; of 4 per cent and over, 5 m.p.h.

Slow downs: Passing over special work when not exceeding 12½ m.p.h., four seconds; exceeding 12½ m.p.h., nine seconds; passing over switches with movable tongues, five seconds; under bridges, five seconds.

Stops: Over special work, one second; at the city limits, inbound, for police inspection, 30 seconds; passing from overhead to underground conduit or vice versa, 30 seconds.

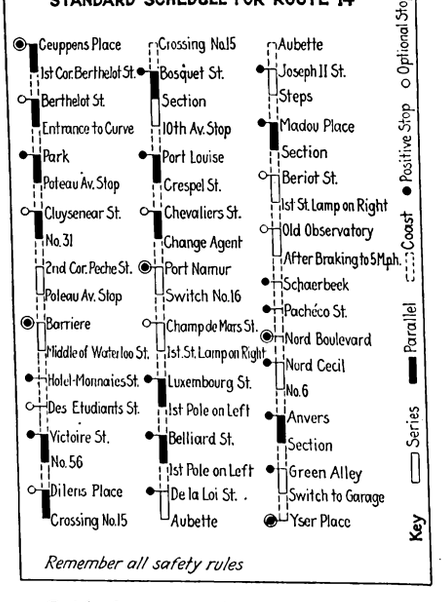
In a number of cities, maximum speeds permitted are covered by ordinances.

Keeping Cars on Time

Some companies issue time tables to their employees; others simply post them in the depots. The practice at Brussels is to give each platform man a time table of his run printed on a card which is varnished to keep it clean. Another card also given to each motorman shows the proper position of his controller between different time points. One of these cards is reproduced. The instructions for the run in one direction are printed on one side of the card, and for the other direction on the other side of the card. Other companies using control guide cards of this kind are Breslau, Budapest, Frankfurt and Amsterdam, and they are being tried in Paris and Copenhagen. The primary purpose of these cards is to reduce energy consumption.

The responsibility for keeping the car on time is placed by some properties on the motorman. By other properties it is placed on the conductor, and by some the responsibility is divided. Preferably, the responsibility for leaving on time should be on the conductor, and of maintaining the proper speed during the run on the motorman.

Apparatus for recording stops and the time taken between stops has recently been put on the market. It consists of a clock movement which draws a piece of paper divided into minutes under a marker, thus giving a graphical record of the movement of the car during each trip. While suitable for some conditions, it does not seem to be very applicable to large city systems where the necessities of the transportation department require the frequent shift of cars from one route to another. For such situations, definite time standards and time tables, with time checking, particularly at the ends of the lines, form the best system of follow up.



Guide for manipulation of controller on route 14, Brussels

While irregularity of headway is unavoidable in congested traffic, much can be done to reduce it by rigorous observance of leaving times from the termini and the employment of enough traffic supervisors along the line to check running time, to assist the crews in case of traffic delays, and to notify division headquarters of any delay that is unusual. It is quite common to vary the number of traffic inspectors on the street according to the number of cars in service. This is done in Brussels.

Automatic Time Clocks Used

Time clocks, at which the crew can get the time stamped when passing certain points, are used on a number of properties. When so employed they should not be at the terminal but a short distance from it, and the cards should be stamped both inbound and outbound. Otherwise they might be stamped at any time during the layover. Copenhagen and some other companies have automatic recording registers for cars arriving at the termini and for passing other points along the line. They are operated by an attachment on the trolley wire.

In a few instances bonuses are given to car crews for the maintainance of good schedules.

An essential aid to regularity of schedules is necessarily a well-equipped emergency force with necessary equipment for removing obstructions on the track, for repairing breaks, etc., and

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a system of telephonic communication by which this emergency equipment can be notified of trouble.

PREPARATION of SCHEDULES

Schedules should be checked frequently by the records of passengers carried on the different routes. These records should show the number of passengers carried by half hours at points of maximum traffic demand and at certain other points along the route. With the zone system, the traffic demand in the various sections of the route can be determined approximately from a check of the receipts. With the flat fare, passengers have to be counted. The time distribution of traffic demand varies greatly with the city. A chart of cars operated on a typical week-day in Brussels is published. As will be seen, it has a distinct mid-day peak.

Regulations on car loading vary widely. Several cities permit higher car loading during rush hours than at other times, believing that it is in the interest of the public. Some cars are arranged so that space taken by seats in slack hours is turned into standing area during the rush hours.

Headways should be determined for different days of the week and different conditions, and should be flexible so that they can be changed promptly, if necessary. In many cities, the maximum time for headways on different routes is specified by the authorities. The ingenuity of the schedule maker is most severely taxed, perhaps, when he attempts to secure even headways on a trunk line used by a number of routes. Here, where a choice has to be made between regular headways on the individual routes and on the trunk line, the former should be given preference by the schedule maker. But much can be done by judicious planning, as shown by the combination of routes 1, 2, 3 and 4 between Bois and Place Stephanie in Brussels, of routes 6, 8, 11 and 12, between Ucele and Place Stephanie, and the combination of all of these routes and route 94½ between Eglise Ste. Marie, and Statue Belliard, as illustrated in the first, second and fourth graphical time tables, reproduced herewith.

STAGGERED HOURS

One question asked of the railway properties in the questionnaire was the extent to which it had been possible to obtain the adoption of staggered hours by large undertakings in their districts. Several reported success.

Antwerp got into action so far as it related to school hours and the hours followed in offices and shops. Nantes secured a spread of fifteen minutes in the discharge of employees from two large neighboring establishments. In Turin, where half of the 15,000 workmen in the Fiat Automobile Works use the street railways, the employees have been divided into three groups whose entrance to and exit from the factory have been spread over an hour, while the hours of the office workers are at still different times.

Building Public Confidence Adds Riders

OBTAINING increased patronage on street railway systems has occupied the attention of railway managements for many years, but since the advent of the motor vehicle the problem has become acute. Of all factors that affect riding, public relations is most important, and the application of good business methods to railway management the most effective in establishing good public relations. These opinions were voiced by J. P. Potter, vice-president Key System Transit Company, Oakland, Cal., at the last meeting of the California Electric Railway Association.

Undoubtedly public good will affects riding, perhaps to a greater extent than is realized, according to Mr. Potter. When buses and private cars offered practically no competition, little did many managers care whether the trainmen were ride salesmen! And to spend money for comfort for the passenger—unheard of! Worst of all, no effort was made to hide this feeling. And from that the idea was born that the trolley company cares only for itself and nothing at all for its customers.

Today much of the pioneering work in establishing satisfactory public relations has already been accomplished. But there is still much to be done. And if increased riding depends on the good will of the public, that much had best be done quickly.

If the conductor of a car is ill-mannered and abrupt with a rider, it does not necessarily follow that that customer must ride the trolley anyway. In that instance, perhaps he must. But tomorrow he takes his car and invites his neighbors to keep him company. Or he takes a bus, possibly with more comfort. All of which means competition. And in business, each must protect its trade by keeping in pace with the demands of its prospective customers. To quote Mr. Potter: "Good business men find it necessary to advertise freely and expend large sums of money to interest the public in their products, and above all to maintain confidence of patrons.

American Association News

Coffin Briefs Received

SIX contestants have presented their briefs in the contest for the 1928 Charles A. Coffin Award. They are as follows:

Shreveport Railways, Shreveport, La.

Northern Texas Traction Company, Fort Worth, Tex.

Virginia Electric & Power Company, Richmond, Va.

Gary Railways, Gary, Ind.

El Paso Electric Company, El Paso, Tex.

San Antonio Public Service Company, San Antonio, Tex.

Plans for Educational Luncheon Conference

SUCH was the interest shown at the educational luncheon conference held at Cleveland during the 1927 A.E.R.A. Convention, that it was decided to include a luncheon conference in its program for this year.

It is expected that the educational luncheon conference to be held on Sept. 25 this year will be one of unusual significance, according to members of the committee. A review of the many accomplishments and sales activities among transportation employees indicates that the years of work of the educational and other committees of the association have been fruitful. The association has felt that these various committees have been carrying on a research for the purpose of finding what instruction could be given transportation employees whereby their behavior on the cars would result in increased sales.

This year the committee on education has adopted a program which is worthy of advance study. For busy executives the educational luncheon conference held on Tuesday, Sept. 25, will afford an excellent opportunity to learn how transportation employees are receiving specific instruction for their jobs.

The open discussion will afford an opportunity for executives to state whether or not they are impressed with the policy that increased rides, other things being equal, is in some ratio to sales instruction.

"Lots of Fun" Planned for Metropolitan Outing

EXTENSIVE plans have been made for the entertainment of the members of the Metropolitan Section, American Electric Railway Association, at its fourth annual outing to be held at Luna Park, Coney Island, N. Y., on Aug. 16.

The day's program will begin at 9 a.m., with an 18-hole golf contest which must be terminated at 2 p.m. This will be followed by various games, including 100-yard dash for thin men, fat men's race, potato race, sack race, pie-eating contest, water-melon eating contest, quoits pitching, baseball, and bathing. At the dinner, which will be served at 5:30 p.m., prizes will be awarded to the various winners.

Wives and sweethearts of the members are invited by Barron G. Collier, as his personal guests, to partake in the evening's entertainment, which will begin at 7:45 p.m., with a parade forming at the gate of Luna Park. Everyone is expected to enjoy the circus as well.

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News of the Industry

Chicago Carries On

City goes ahead with plans for traction settlement and construction of high-speed rapid transit line

AS A result of the two recent decisions of the Illinois Supreme Court which held that under the act creating the Illinois Commerce Commission the city has no power to compel electric railways and bus lines to obtain local franchises for the use of its streets, negotiations for the settlement of the Chicago railway problem again are virtually at a standstill.

Asserting that the Supreme Court's decisions render the city helpless to deal with the companies, the local transportation committee of the City Council, in a statement issued on July 17, called upon the companies and railway bankers to agree to a home rule program and to take the stand that no railway ordinance shall become effective until home rule is restored to Chicago. Leonard A. Busby, president of the Chicago City Railway, who was present at the meeting of the sub-committee, replied that his company would willingly co-operate with the Aldermen on that basis.

The appropriation by the City Council of $649,928 from the city traction fund to finance subway building plans was held to be illegal in an opinion rendered on July 13 by City Comptroller Charles C. Fitzmorris. Mr. Fitzmorris announced that he would not honor the vouchers drawn on the fund by M. J. Faherty, president of the board of local improvements, until such an appropriation was sanctioned by the voters at a referendum. He declared that a specific provision of the annual budget prohibited the withdrawing of money from the $55,000,000 traction fund, without holding a popular referendum for that purpose, and that the Council, therefore, had acted without authority.

Mr. Faherty had asked the Council to appropriate the money for the purpose of defraying the salaries of real estate experts, draftsman and engineers, and other expenses in the preparation of a downtown subway construction plan. The procedure he advocated was to draw all specifications for a tube on State Street, spread the assessments, and then go into court where the validity of building subways as a local improvement would be tested. While the comptroller's decision brought a temporary halt to the city's subway plans, Alderman J. B. McDonough, chairman of the local transportation committee, said that the committee would probably begin soon drafting an ordinance authorizing the expenditure for submission to the voters at the November election.

The active assistance of prominent architects and engineers of Chicago, composing the recently designated Citizens' Advisory Board, was pledged on July 23 to Mr. Faherty, in planning the general architectural layout for a comprehensive downtown subway system. A committee of three architects and four engineers was appointed to work out the general scheme for the tubes. It will review all subway plans and will select the one which seems best suited to the requirements of the local situation. Other committees will then be named to go into the details of the architectural and engineering features.

The advisory board was created at a meeting on July 19 between James Simpson, chairman of the Chicago Plan Commission, and Mr. Faherty, who had appealed to the Plan Commission for assistance as a result of the refusal of City Controller Charles S. Fitzmorris to recognize a $647,928 appropriation by the City Council to pay for the work of engineering surveys and plans. Following the completion of engineering plans, Mr. Faherty intends to make special assessments and take a test case into court so as to build the subways as a local improvement.

While the citizens' committee will not be asked to pass on the legal and financial arrangements, Mr. Faherty explained to its members that he proposes to pay for the first unit of the new subway by issuing special assessment paper and depositing it with the City comptroller. Money from the $55,000,000 traction fund would then be loaned to the board at 5 per cent interest on the basis of the security offered. When assessments are paid by property owners, the money would be credited to the traction fund, to keep it intact.

Baltimore Case Remanded

Court of Appeals holds commission was in error on several points in recent ruling. Rate-fixing commission function. Commission erred in taking orginal cost instead of reproduction figure

THE Baltimore car fare case is to be taken into the United States Supreme Court for final settlement. This decision was reached by the officials of the United Railways & Electric Company after the Maryland Court of appeals had handed down a decision partially reversing that of the Circuit Court of Baltimore.

When the United appealed for a 10-cent fare the Maryland Public Service Commission refused the plea, but granted an increase to 9 cents for cash fares or three tokens for 25 cents. The company took the case into the Circuit Court with the result that a decision was rendered against the Public Service Commission which opened the way for an increase on the part of the company. The commission then took the case to the Court of Appeals.

Commission's Depreciation Allowance Criticised

It was held by the Court of Appeals that the commission's method of fixing an annual depreciation reserve on "cost" instead of "value" was wrong and the case was remanded to the commission for further procedure. It is held that this ruling would result in a slight increase over the present fare. But the United has determined to take the case to the Supreme Court.

It was said by the company that the effect of the latest ruling is a rate of return so low that it amounts to confiscation and puts the company in a credit position where it cannot raise the necessary millions of dollars with which to maintain car service in Baltimore and provide for the future needs in financing and development.

The decision of the Court of Appeals of Maryland was written by Judge Offutt. Chief Judge Bond and Judge Parke dissented in part. The opinion goes into the case in great detail. The syllabus of the decision says:

Application was made by a street railway to the Public Service Commission for permission to increase its base fare to 10 cents, alleging an apprehended financial crisis and urging that it be allowed the increase immediately as an emergency measure. After testimony, the commission denied the application but permitted the company to collect a base rate fare of 8⅓ cents when fare checks are purchased, or 9 cents cash for each passenger more than twelve years of age. The company being dissatisfied, filed a bill asking that the order be nullified in so far as it prevented a charge of a flat 10-cent fare, and asked that the commission be enjoined from enforcing its order or any prior order limiting the company's rates. A decree was passed vacating the order in so far as the same purported to limit the rates to the company, and enjoining the commission from enforcing that or any other orders in so far as they limit or purport to limit the rates of fare to be charged by the company, and ruling was based upon the commission's "election" not to have the case remanded to them.

Held: That a court has no right to fix rates, as its function is judicial and confined to determining whether an order of the commission is valid or invalid, and if the order is unlawful or confiscatory then the case should be remanded to the commission for further proceedings in accordance with such guides, rules and standards as the court might by appropriate decree direct.

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That under the statute, the power to fix rates is in the commission alone.

That a schedule of rates which permits the company to earn 6.26 per cent on the fair value of its property cannot be sa.d to be confiscatory.

That the company is entitled to such an allowance as will not only adequately provide for current repairs, but for depreciation due to necessary retirements, obsolescence, and diminishing utility of property which cannot be arrested by repairs.

That the commission in fix.ng the fare schedule allowed 5 per cent on the gross revenue for depreciation, and it considered the cost and not the present value of the company's depreciable property, and in so doing it did not adopt the proper method, and the case should be remanded to the commission in order that it may determine the proper allowance for depreciation, and if necessary readjust the rate schedule to cover any changes it may make in that allowance.

In conclusion the court said:

For reasons already stated it follows that so much of the decree from which this appeal was taken as vacates that part of the order of the commission which fixes the schedule of fares to be charged by the company, and so much of said decree as enjoins the enforcement of that part of said order was erroneous, but because that schedule was in part based upon an allowance for annual depreciation arrived at by unlawful and unreasonable methods and by the use of an unlawful and unreasonable basis, that part of the decree will neither be affirmed nor reversed, but the case will be remanded in order that the commission may further consider the question of depreciation and make any changes in the rate schedule which may be necessary and requisite to yield to the company a fair and reasonable return upon the fair value of its property. So much of the decree as affirms that part of the order which extends the first fare zone of the Halethorpe line to the terminus thereof will be affirmed.

Decree affirmed in part and reversed in part and case remanded for further proceedings in accordance with the views expressed in this opinion, each party to pay one-half the costs.

The Public Service Commission has denied the request of the company that hearings be held on the depreciation issue in the fare case, pending action by the Supreme Court on the appeal taken by the United from the decision of the Maryland Court of Appeals. At the same time the commission has decided to ask the United States Supreme Court to review the action of the Court of Appeals on the depreciation issue and also on the question of how far the commission is required to go in granting fare increases to make up for losses caused by automobile competition. This, it is held, takes the entire case into the Supreme Court.

From Two-Man to One-Man in Indiana

The Indiana Service Corporation has been authorized by the Indiana Public Service Commission to change from two-man to one-man operation between Fort Wayne and Garrett and between Garrett and Kendallville, and Garrett and Waterloo.

Children Favored in Springfield

Under special permission of the Department of Public Utilities the Springfield Street Railway placed in effect in Springfield, Mass., on July 1 one-half rate children's tickets, selling in strips of five coupons for 25 cents. These tickets are to be used by children between the ages of five and fourteen and will be good until Sept. 3, 1928. This innovation will be to the advantage of children attending summer school sessions. They can purchase these tickets in preference to the pupil's 4½-cent tickets as the pupil's tickets are restricted to use only to and from school on days when school is in session, whereas the 5-cent tickets may be used any time and any where on the property.

Free Ride in South Bend

Through a special arrangement between the Chicago, South Bend & Northern Indiana Railway and leading downtown merchants, South Bend, Ind., shoppers were carried free of charge to and from the business district on city street cars on Tuesday morning, July 17. The "free ride day" is a repetition of the arrangement started last year by the railway. It resulted in a large increase in trade at local stores. Special bargains were advertised again this year and large throngs were reported at shopping centers.

Massachusetts Electrification to Be Finished by October

The Boston, Revere Beach & Lynn Railroad will be completely electrified by about Oct. 1, according to an announcement by the management. At that time more frequent service will be given between Boston and Lynn, Mass., and intermediate stations, including the beach stations. The road will have prepayment areas at the various stations, like the Boston Elevated.

100 per Cent One-Man Operation in Kansas City

THE last of the lines of the Kansas City Public Service Company, Kansas City, Mo., operated with two men to a car, namely, the line to Independence, Mo., was changed over on Sunday, July 15, to one-man operation. thus completing the program started on July 4, 1927, when the Country Club line was changed from two to one-man operation.

Prior to that time about 37 per cent of the company's car-hours and car-miles was one-man operated. Since July 4, 1927, the change-over has been made on an average of one line a month, and as now indicated the job is completed. Kansas City Public Service is now 100 per cent one-man operated, with more than 70,000 car-miles run a day. Moreover, the change to one man operation has been accomplished without laying off or dismissing any of the trainmen.

Counsel for Cincinnati Commission Under Fire

Edward D. Schorr, counsel for the Rapid Transit Commission of Cincinnati, Ohio, and chairman of the Republican Campaign Committee of that city, is to be tried on Aug. 7 by the Civil Service Commission of Cincinnati, a non-partisan body, to determine whether or not he has violated, an article of the city charter that forbids anyone in the city administrative service to have anything to do with political contributions or assessments. Mayor Seasongood, recently charged that Mr. Schorr must have violated this provision in the charter because as campaign manager he must have been concerned with political funds. Mr. Schorr refused to make a statement on July 19, but he has repeatedly said that if it were not for the embarrassment it might cause his political party if he were to resign under fire, he would gladly give up the job.

Group Insurance in Memphis

The management of the Memphis Street Railway, Memphis, Tenn., recently entered into an agreement with the Metropolitan Life Insurance Company whereby its employees will benefit by insurance protection under the group plan. Without the necessity of a physical examination each employee is insured without cost to himself to the amount of $500, with the privilege of increasing the coverage up to a maximum amount of $2,500 graded according to length of service at a nominal cost payable monthly. Under the plan the named beneficiary receives the insurance, regardless of the nature of the death, and upon proof of total and permanent disability before the age of 60 years, the insurance will be payable in installments. In case of death before the insurance is fully paid the beneficiary receives the balance. In case of recovery the policy will be reduced by amount of the installments paid and continued in force in its reduced amount.

Hearing on Piedmont & Northern Case in Fall

The suit of the Piedmont & Northern Railway to set aside the recent refusal of the Interstate Commerce Commission to allow the electric railway to extend its lines from Spartanburg, S. C., to Gastonia and from Charlotte, N. C., to Winston-Salem, will be heard in Asheville beginning Oct. 2 before Circuit Judges Edmund Waddill, Jr., and Elliott Northcott and District Judge Morris A. Soper, Baltimore. Judge Soper made the announcement at Greenville, S. C., where the suit was originally filed. Charles Evans Hughes is chief counsel for the Piedmont & Northern.

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What Could Hamilton, Ohio, Expect?

City which countenanced jitney and kept fares at 5 cents now seeks unification of services

City Councilmen and Russell P. Price, City Manager at Hamilton, Ohio, have agreed that a unified system is the only solution to the transportation problem in Hamilton. To bring about a unified system, Council has authorized the City Manager to receive proposals from bus companies and railways interested in handling transportation in the city as a single unit. Action to this end was taken after a detailed report had been submitted by the City Manager delineating the present situation and recommending improvements.

As an example it is cited that a solution would be brought about if the railway lines would take over all buses and issue transfers from bus routes to car routes. It also is cited that a unified system would be created if a merger between car lines and bus companies were formed. Mr. Price said in substance:

Eighty-two per cent of the riding public uses street cars. Car service alone is inadequate. Car lines cannot be extended, it is estimated, unless an increased car fare is granted. City officials, in all probability, would not permit an increase in car fares.

Eleven buses carry about 18 per cent of the riding public.

Buses are dilapidated, uninviting, unsanitary and unsafe.

A unified system would mean safe, sanitary, reliable and convenient transportation for the entire riding public of Hamilton.

Later, City Manager Price declared proposals received will be transmitted to the City Council for examination and approval. The report says:

The year 1921 saw the advent of the bus. Since this time Hamilton has grown steadily but its transportation facilities have not kept pace. True, new and better railway equipment has been added, but save in one instance, the lines have not been extended to meet the growing needs of the city.

The riding public of Hamilton is served through two channels of transportation:

1. The city street car lines operated by the Cincinnati, Hamilton & Dayton Railway, along regularly established routes.

2. Buses operated throughout the city by private individuals and under no definite plan or established routes.

Summarizing the present situation, we find a city that has grown in territory and population within the last seven years and a transportation system not commensurate with its growth; we find a railway system which has made practically no extensions to its lines within a period of five years; we find independent buses cruising, for the most part, on routes of their own choice; we find railway equipment in good shape but the service in itself inadequate unless certain extensions are made; we find buses transporting thousands of men, women, and children weekly, on which the owners, for the most part, carry insufficient liability insurance in the event of a serious or fatal collision.

Since its reorganization the railway has expended $250,000 in the reconstruction of tracks, the supplanting of the old dilapidated cars with new and modern one-man cars and in providing for a modern source of power supply. Service today, in so far as it extends, is on a par with similar service in other municipalities of the size of Hamilton, but nevertheless is inadequate to meet the needs of a city that is still growing.

Today about 82 per cent of the Hamilton riding public depends upon the street cars for transportation.

The question naturally arises: Why then does not the railway endeavor to secure a full 100 per cent of customers by extending its lines and expanding to meet growing needs?

I am not in position to answer for the officials of the railway, but our survey has included estimates from other cities, showing the probable cost of extending car lines to meet the present needs and those of the future. As a result I do not hesitate to estimate that a railway extension program such as would be needed here would involve a total expenditure of close to $500,000. If we city officials were private officials of a railway would we authorize the expenditure of $500,000 under a 5-cent fare? The answer goes without saying.

City Manager Price, and J. H. McClure, general manager of the Cincinnati, Hamilton & Dayton Railway, are in accord on the proposed unification of transportation in this city, for since Mr. Price recently outlined results of a survey Mr. McClure has agreed that extension of tracks would mean an increase in fare. In a statement being studied by officials, Mr. McClure said that the problem to be solved "is the provision at reasonable cost of satisfactory auxiliary service to C. H. & D. local railway lines." The statement is regarded as a bid for renewal of the franchise which expires on June 10, 1930, with a promise to establish bus lines as feeders to street cars.

Trial Operation in Philadelphia

New Broad Street subway to go into service Sept. 2 under temporary arrangement with the Philadelphia Rapid Transit

MAYOR MACKEY'S proposal that the Philadelphia Rapid Transit Company operate the city-built Broad Street subway, Philadelphia, Pa., for a 90-day trial period, beginning about Sept. 1, at the 8-cent, two for 15, fare, with transfer and exchange privileges, was accepted by the company on July 24. The Mayor's action as advanced in his proposal in a letter to Ralph T. Senter, president of the company, came as a surprise in City Hall, inasmuch as the Public Service Commission and the engineering firm of Ford, Bacon & Davis, New York, engaged by the city administration, had started a survey of the subway's earning power presumably as a basis for an operating agreement. The Mayor said immediate action was necessary.

In its answer the company objected to the imposition of $1,200,000 in carrying charges during the experimental period as asked by the Mayor unless a higher rate of fare were provided. It said that the potential earnings would not enable it to meet these charges, but suggested a figure of $600,000. In addition, Mr. Senter sought the option of cancelling the operating lease upon 24 hours' notice after the completion of the three months' period of trial operation. He said there would be no objection to the 24-hour recapture clause in the city's favor.

On July 25 the transportation committee of the Council passed a resolution urging Mayor Mackey to accept the company's offer of $600,000 for operating privileges during the three months' trial period. At this meeting the Mayor announced that he would be bound by the members' recommendation and would withdraw his proposal that the company meet the entire $1,200,000 carrying charges on the $87,656,000 construction cost of the tube during the initial operation. According to the Mayor the plan calls for free rides for the public in the subway on Sept. 1 and the actual opening on Sunday, Sept. 2.

The initial three months' lease will be substantially along the line recommended by J. Rowland Bibbins, utilities expert of Washington, D. C., who made a survey of the potential earning capacity of the subway at the request of the Kendrick Administration and is now employed by the Northeast Chamber of Commerce. Present transfer and exchange privileges will be maintained and the distribution of revenue between the tube and feeder lines will follow the practice in use throughout the country.

It was said that Ford, Bacon & Davis, engaged as consultants by the Mackey Administration, would audit the company accounts daily for the Department of City Transit during the trial period. The only point at issue on July 25 was the designation of Director Myers, of the Department of City Transit, as the auditing agent for the city during the trial operation. Mayor Mackey, in a prepared statement, said that Controller Hadley and the Philadelphia Rapid Transit Company at present were engaged in a controversy over the auditing of the P.R.T. books and the submission of annual reports, and that he had named Mr. Myers for the Broad Street subway check-up because he did not wish to take any position in the Hadley-P.R.T. discussion.

In a resolution offered by Edwin R. Cox, president of the City Council, it was suggested that the Mayor and City Solicitor Ashton meet P.R.T. officials at once to negotiate the experimental contract. When that document is drafted, Mr. Cox said, the Council will meet in special session to pass the necessary legislation. It is the consensus of opinion that the Public Service Commission will immediately approve the contract after the ordinance is passed by the Council and signed by the Mayor. The commission had already recommended that the city and the P.R.T. sign a short-term lease of this character.

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Jitneys Must Leave Columbia Streets

Another snarl in the transportation tangle in Columbia, S. C., was unravelled recently when the State Supreme Court handed down an opinion refusing to enjoin the city of Columbia from enforcing an ordinance, recently passed, which "routes" the 10-cent jitneys. Jitney drivers had brought action against the city of Columbia in an effort to get an injunction against driving the jitney from the streets. By the terms of the ordinance, the City Council outlined certain routes which were to be assigned to jitneys as they applied for licenses to operate in Columbia. It was conceded that the strength of the jitney's popularity rested in its flexibility —it had no definite route, went anywhere and carried its passengers direct to their doors. The jitneys were usually operated by their owners, though a few men operated a fleet of three or four. They were required to stay on the streets for no stipulated time and went off according to the driver's will.

The chief justice of the Supreme Court, in dismissing the petition for an injunction against the enforcement of the measure, said:

> We think the ordinance in question should be sustained. It is essential and necessary for the welfare of the city of Columbia that it have regulated public transportation, operated upon regular routes and schedules.
>
> The city has the right to enact and enforce the ordinance in question. No one has the inherent right to carry on his private business along the public streets. Such rights can be exercised only under such terms and conditions as are imposed by the city authorities.

There are a few jitneys still in operation, but they run on definite routes. The city of Columbia is in a rather peculiar condition as to its streets, as the title to them is vested in the state of South Carolina and not in the city itself. The city was laid out for the capital of the state and the ownership of the streets left with the state, and this fact has been the cause of much litigation.

Street cars, unable to meet jitney competition, stopped operations in Columbia in March, 1927. Since that time buses and jitneys have fought for patronage. With the jitney disposed of, the buses, it is thought, will be able to expand their service. There is considerable complaint at the present time because of inadequate service.

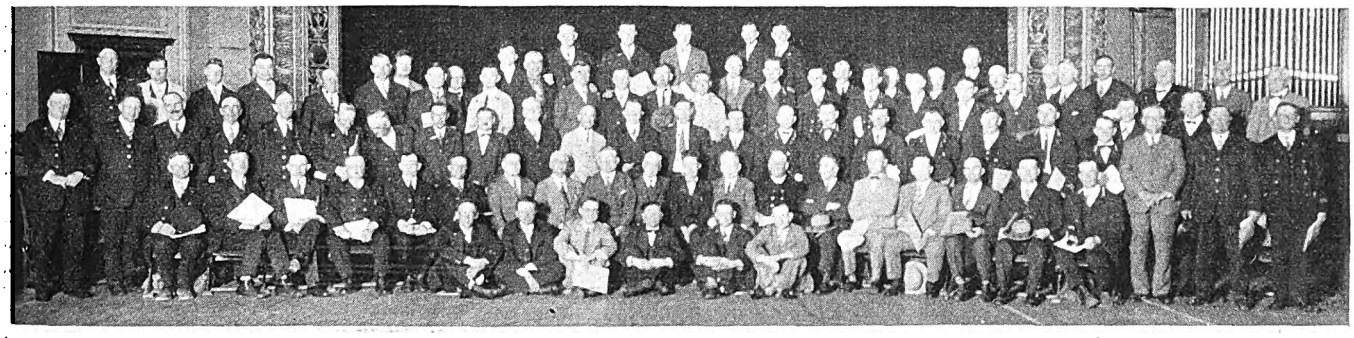
No decision has yet been rendered in the matter of restoration of street car service. Some weeks ago a hearing was completed which had as its object the ordering of the Columbia Railway, Gas & Electric Company to resume street car service.

Graduates Awarded in Milwaukee

Exercises were held at 9:30 a. m. on June 25 at which certificates were awarded to men in the transportation department of The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., who took optional courses on their own time. Among those who received certificates were trainmen, supervisors, instructors and the assistant superintendent. The meetings for the awarding of certificates throughout the company were held by departments. This was the first year that courses were offered in the transportation department.

The program consisted of a light luncheon in the dining room and a meeting in the Lodge room adjacent. At the meeting there were talks by George Kuemmerlein, superintendent of transportation; Dr. Rowland, educational director, and two of the men receiving certificates, Messrs. Lamster, and Hackborth, division superintendent and chief instructor respectively. After the addresses the certificates were awarded individually by the superintendent of transportation. It was not possible for some of the men to attend because of working conditions.

Optional courses in the transportation department for 1927-28 included trainmen's English, trainmen's mathematics, a course on air brakes for the safety car, a course in electrical equipment on the safety car and one in electrical equipment on the interurban car and a course in motor bus problems. The total enrollment numbered 277 employees.



Those in attendance at graduation exercises in Milwaukee

Cars Chartered for Anniversary Sale in Nashville

A gratis trolley ride was afforded patrons of the Nashville Railway & Light Company, Nashville, Tenn., on May 7, the opening day of the 54th anniversary sale at Lebeck's store. The sale lasted through May 19. A schedule specifying times of departure of all cars from every section of the city on the trip to downtown Nashville was published in the *Tennessean* of May 6.

Twenty-seven Years Without a Fatality in Boston

Two persons were killed and 23 others were hurt on July 22 when a four-car train of the Boston Elevated Railway, Boston, Mass., running from Dudley Street to South Station left the rail at the curve entering the Beach Street unused station. The first car drove against the elevated structure of the southbound rail in an upright position. The second car swung across both northbound and southbound tracks practically upright, and the third and fourth cars remained approximately in position. There were 34 passengers on the train. Of the 23 persons taken to the hospitals all but two returned to their homes at once. The accident was the first instance of a passenger in an elevated train of the company being killed since the main line was opened on June 10, 1901.

The accident happened at approximately 7 p.m. in a heavy rain. The inspection, made at once, showed no evidence of a mechanical defect in car or track. The control handle was found in the "power on" position. All four cars were steel (there being no wooden elevated cars in service), the first car having been in service since 1922 and the second car since 1927. The first car was inspected on July 19 and the second car on July 21. The motorman has been in elevated train service for ten years and qualified as a motorman in 1927.

Community Service in Minneapolis Car Ad

An advertising card in Minneapolis, Minn., street cars entitled, "A Grudge Is Too Much of a Load for Any Man to Carry," was the subject of comment and praise by W. A. Evans, who runs a "How to Keep Well" column in the daily and Sunday Minneapolis *Journal*. He says that the placard is part of the educational community service of the Minneapolis Street Railway. The placard can be read easily by pedestrians on the sidewalks and by people in vehicles in the street. All ad writers who fight grouches are doing a big service, in the opinion of Mr. Evans, who cites the instance of Barron Collier's community service to Chicago twenty years ago in giving the Health Department the exclusive right to use space in each street car in Chicago free, in order to promote good health.

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Finding in Hamilton Affects Fare and Wage

A recent finding of the Ontario Railway & Municipal Board affecting the fare schedule in Hamilton, Ont., provides for a cash fare of 7 cents, tickets four for 25 cents and children's fares ten tickets for 25 cents. The decision on the wages provided for a schedule for motormen and conductors in cents per hour as follows:

First year 42, second year 46, thereafter 52.

Bus and one-man car operators 5 cents per hour additional.

Time and one half for over time and work performed on legal holidays.

Another factor of live interest in Hamilton just now is the jitney. A lower court has declared that the jitneys are operating illegally, but an appeal has been made to a higher court, and pending the findings of this court, they continue to operate.

Bill for Extension of Boston Subway Signed

Governor Fuller of Massachusetts has signed the bill enacted by the Legislature for the extension of the Boylston Street subway under Governor Square to solve one of the difficult traffic problems on the Boston Elevated system. This is the only piece of legislation the Governor was able to obtain from the Senate and House relative to the Boston Elevated, although he was pressing hard for an Act to extend public control and to build new rapid transit lines. It is believed, however, that the foundation has been laid for legislation of this kind next year.

Under the new bill the city of Boston is to pay, out of taxes, one half of the cost of the Governor Square construction work, and the Boston Elevated Railway is to pay the other half of the income from fares. The bill is believed to be satisfactory to the Boston Elevated trustees and board of directors. It is subject to approval by Mayor Nichols of Boston.

Subway Plan Advanced in Pittsburgh

The City Council of Pittsburgh, Pa., expects to hold conferences soon with the municipal transit commission on the subway plans. As one of the commentators sees it the work of the transit commission has produced a real method of procedure that now looks ahead clearly, where before there was dilly-dallying and confusion. In this connection it has been recalled that a constitutional amendment is to be voted on this fall in connection with the proposition to open the way for the application of the district assessment plan. Under the latter there would be assessment of benefits upon property whether abutting the subway or not which would be specially benefited by its construction and operation.

This plan, it is estimated, would require $36,000,000, for which a bond issue of $6,000,000 already has been authorized. Under arrangement for use of the subways, the Pittsburgh Railways would be expected to take care of part of the financing. With the approval of the constitutional amendment, it would still be left to the citizens of Pittsburgh to say whether they wanted the district assessment plan to apply. Even under the most favorable procedure it would be unlikely that construction of the subway could start earlier than 1930.

Rehearing in St. Louis Fare Case Refused

The Missouri Public Service Commission on July 25 overruled motions by the city of St. Louis and the St. Louis Public Service Company in the 8-cent fare and valuation case. The city still has the right of appeal to the Circuit Court of Cole County. The company having been granted the fare rate requested in its original application has no such right of appeal, but can initiate entirely new proceedings.

The commission fixed the valuation of the company's property at $66,000,000. The company sought a valuation of $75,000,000 while the city contended $53,000,000 was sufficient. The company also sought a return of 8 per cent while the city held out for 7 per cent The commission fixed the return at 7.14 per cent.

The 8-cent fare for adults became effective July 1.

Sketches Wanted in Portland

A cash prize of $25 is to be awarded for the best "masthead" or illustration for the first page of *Watts Watt*, the pamphlet distributed on the cars of the Portland Electric Power Company, Portland, Ore. The contest is open to amateur, professional and student artists who have a sense of humor and know how to make a finished pen-and-ink drawing and to letter into the design the title, *Watts Watt*. Preference will be given to drawings which show the three major activities of the company and indicate action. The drawings must be designed to reduce to 3¼ in. in width and not more than 2¼ in. deep. The designs must be submitted not later than Aug. 15. They will be considered by three judges not connected with the Portland company.

News from Florida to Come Monthly

Publication of *Florida* by the Florida Public Utilities Information Bureau is being resumed for the dissemination of news regarding the utility business in that state. It will cover also industrial, financial and agriculture features. The first issue, dated at Sanford, is an eight-page pamphlet. The editor says the utility plants of Florida are doing a job in development big enough to have publicity in that state and other states.

South Shore Line-Gary Railways Establish Fund to Aid Industries

An industrial financing fund of $200,000 for the purpose of aiding in local industrial development has been created by the Chicago, South Shore & South Bend Railroad and the Gary Railways in company with other subsidiaries of the Midland Utilities Company, Chicago. From this money will be loaned to customers and prospective customers and patrons of the several companies, as a means of aiding in the industrial expansion of the areas which they serve. According to the official announcement, loans will be made on such a basis that the total amount of loans outstanding at one time in any community using transportation service will not exceed $1 for each $300 of annual gross revenue derived in such community from passengers ticket sales for profitable interurban railway traffic. Money also will be lent to customer-industries in the discretion of the committee for other business purposes where the loan promises to assure or to increase the demands of such industries for utility service.

The plan of aiding in the industrial promotion of the communities served by these companies, says the announcement, is in line with the progressive policy of chambers of commerce in many cities throughout the country of assisting in the financing of worthy manufacturing enterprises.

In cities where some community plans on industrial financing are in effect, the companies will participate in the plan. In cities where such plans are not in operation, the companies will handle the matter through the local chamber of commerce or similar organizations, or direct with the manufacturers, depending upon the circumstances.

The administration of the new fund will be under the control of committees, but negotiations will be handled by the local representative of the company or companies in each community.

Londoners Visit the United States

Frank Pick, managing director of the London General Omnibus Company; O. J. Watson, development engineer of that company, and H. R. Fisher, engineer for the Associated Manufacturing Company, from which the London General Omnibus Company buys its equipment, are on a visit to the United States. They came over on the *Maurctania*, which also carried among its passengers Matthew R. Boylan, vice-president in charge of operation of the Public Service Co-ordinated Transport, Newark, N. J., and Martin Schreiber, general manager in charge of plant of the Newark company, who, as noted previously in the JOURNAL, studied transportation in London, Paris and Berlin while they were abroad.

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Foreign News

Trans-Pyreneean Lines in France Being Electrified

With the opening of the so-called Pau - Laruns - Bedous - Canfranc - Jaca trans-Pyreneean railway in July, 1928, by the Midi Railway, the first of three proposed trans-Pyreneean routes will have been completed.

An agreement for the construction of this line, as well as for a line from Toulouse to Barcelona, via Axles-Termes-Latour de Carol, and a line from Saint Girons to Lerida, was reached by a convention between France and Spain, ratified in January, 1907, which fixed a ten year limit, afterwards extended, for completion of the two first-named projects, and for partial construction of the latter. The Toulouse-Barcelona railway, which on the French side is under construction by the Midi Railway, is expected to be completed next year.

Considerable work remains to be done on the trans-Pyreneean railway from Saint Girons to Lerida via the Salau Pass, and no prospective date of opening has been set. The point selected for traversing the mountains is about midway between the two other lines.

The program of railroad electrification that is being carried on by the Midi Railway throughout this part of France has been a factor of great importance in enabling work to be undertaken on the several trans-Pyreneean projects. Electric locomotives will be used entirely on the trains operating on the French side.

Madagascar Electrification Approved

Government approval has been given for the electrification of 39 miles of the Tananarive-East Coast Railway, Madagascar, at an estimated cost of £166,000, not including electric locomotives. The work will require about six years for completion. It is estimated that the entire line from Junck to Tananarive, which rises constantly through a mountainous country, could be electrified at a cost of £500,000, but at present only the section having the heaviest gradients and sharpest curves is included in the project.

Hungarian Railway Offers Bonds

Two classes of bonds were offered for subscription in London, England, on May 10, in the £2,300,000 loan of the Hungarian Trans-Danubian Electrical Company, to be used for the construction of a large power plant at Bashida and the electrification of the Budapest-Hegyeshalon (Vienna railway line).

Series A comprise £1,000,000 of 4½ per cent 25-year bonds, issued by the Bank of England at 97, and guaranteed by the British Government under the Trade Facilities Act. Series B consists of £1,300,000 of 6½ per cent 33-year bonds, issued by the Whitehall Trust Company, Ltd., London, at 93. The bonds of series A were taken over at 95½, those of series B at 89 by the issuing banks, which will also pay the British stamp tax. Bonds of both series will be registered bonds, their amortization beginning in four years. The revenues of the Hungarian State Railways are pledged as a security for capital and interest.

Tramways Support Schools in China

HAVING begun to pay small profits for the first time in its three-year history, the Peking Tramway has been selected by the government to pay the upkeep of 30 primary schools.

India Installs Suburban Electric Service

Electrified suburban service covering an area of about 39 miles has been opened in Bombay, India, by the Bombay, Baroda & Central India Railway. Power required for operation of the service is obtained from a hydro-electric generating station in the Western Ghat Mountains, about 100 miles from Bombay.

The electrification scheme is designed principally to meet the growth of traffic during the past few years. So far it has cost more than 20,000,000 rupees, or about $7,000,000, including the purchase of new rolling stock.

The same service is expected to be extended in the future to the Poona and Igatpure line of the Great Indian Peninsula Railway and probably electrification of most of the freight trains working in Bombay.

Southern Railway Extends Electrified Service

Additional sections of the suburban lines of the Southern Railway, London, England, were put into electric operation recently. About 79 miles of track are involved, half of which represents a conversion from the overhead wire, single-phase system to the third-rail system. The other half is a conversion from steam traction to the third-rail system. Equipment and appliances are similar to those on the lines already electrified.

The completion of electrification of the remaining lines embraced in the whole scheme is expected to be reached some time next year.

Air-Railway Freight Service in Switzerland

Establishment of co-operative railway and air freight service in Switzerland was provided for in an agreement signed on March 21, 1928, by the Swiss Federal Railways and the Basel Air Traffic Corporation on its own behalf and on behalf of the other air traffic companies licensed in Switzerland. The air lines are empowered to issue through bills of lading for the transport of merchandise from stations in Switzerland to foreign air ports and vice versa, both by air and rail, and also from one foreign air port to another in transit by rail through Switzerland. The bills of lading will stipulate what portion of the journey is to be covered by air and what portion by rail. Merchandise received by the railways from air lines will be transported as express, in order to insure prompt delivery.

The railways will receive a fee of 1 franc (19.3 cents) for each shipment delivered for transportation abroad, or for delivery in Switzerland, in addition to the usual freight rates and such other additional expenses as may accrue, while the air lines will receive their regular traffic charges based on tariffs now in effect.

This agreement, which became effective on May 1, 1928, continues indefinitely unless notice to terminate is given three months before Dec. 31, 1928. After that date it may only be terminated by either party giving six months' notice before the end of any calendar year.

Czechoslovakia To Build New Railway

Plans for the construction of a new electric railway line from Teplice-Sanov to Aussig are now under consideration by the Czechoslovak State Railways. Within four or five years it is also planned to electrify the Prague-Ceska-Trebova line.

Japanese Rapid Transit Line Organized

Construction of a rapid transit line between Gotanda, Japan, in Osaki-Machi, Tokyo, and Ura-Takashimachō, Yokohama, a distance of 14 miles, is to be made by the Tokyo-Yokohama Rapid Transit Electric Railway, Ltd. This company has just been formed with a capital of 10,000,000 yen (about $4,600,000).

9,000 Trousers a Year Issued in London

The London Underground group of railways has 4,500 employees, to whom it issues uniforms. As there are 4,500 men so employed, this means annually 9,000 trousers, 4,500 jackets, 4,500 hats, 2,250 overcoats (one every two years), beside 1,000 overalls for the motormen and porters.

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Recent Bus Developments

Through Service in Massachusetts

Replacement of railway proposed by a new service more inclusive than that of former railway

AFTER several months of hearings, petitions and controversies, the Milford, Framingham & Uxbridge Coach Company in Massachusetts has been given a franchise to operate buses in Milford, Mass., by the Selectmen of that town.

Permission from the State Necessary

The officials of the coach company must now apply to the State Board of Public Utilities for permission to discontinue the trolley line and establish the bus service. The Medway and Milford trolley line, owned by the Milford, & Uxbridge Street Railway and controlled by the same financial interests that are acting as sponsor for the coach company, will be discontinued, the usual notices already having been posted.

The bus line will run as far as the town of Medway, thus enabling through service to Boston from Milford through connection with another bus line in that town. The through-service idea figured prominently in the controversy, the Selectmen insisting that the bus route be laid out so that this would be possible, having in mind that at Medway passengers of the coach company could get service from the Johnson Bus Company, which operates buses from Medway to Roxbury, on the outskirts of Boston.

Ten-Cent Fare Provided

The bus license specifically stipulates that there shall be a 10-cent fare instead of the proposed 13-cent fare on all of the company buses. In addition the fare from Lincoln Square to the Hopedale town line will be 5 cents. The Selectment were also given to understand that insofar as possible all employees of the railway will be kept in the service of the coach company.

As soon as the public utilities department takes action there will be an important bus development in Central Massachusetts, for the company plans to operate far beyond the confines of Milford. It plans through service for such towns as Framingham, Uxbridge and East Douglas. Milford was the only town between Framingham and East Douglas that delayed action on the coach company's request for a franchise. The delay in permitting the bus lines to get started was a blow to residents of those places for recently trolley service was abandoned between Framingham and Milford and Holliston town line between Hopedale and Uxbridge. The bus concern will operate where the trolleys have been taken off. The coach company has been granted permission to operate in Whitinsville, which was heretofore without a public transportation service.

When they first refused the coach company's petition the Milford Selectmen granted the Johnson Company the right to operate in the town if railway service ceased. The Johnson Company had already filed petitions in other towns on the through route proposed by the coach company. The officials in these towns, however, favored the coach company. It is understood the officials of the coach company and the Johnson Company will work out an amicable agreement covering the territory.

Hearings Re-opened on Chicago's Feeder Service

By re-opening on its own motion on July 14, hearings on the petition of the Chicago Surface Lines to operate motor coach feeders on the northwest side of the city of Chicago, the Illinois Commerce Commission has given itself an opportunity to reverse its own order allowing the Surface Lines to operate the buses, despite a recent court decision upholding the legality of that order. The explanation given by the commission for re-opening the case after it had been closed for several years was that it wanted to establish a definite policy on the operation of feeder buses by the Surface Lines.

The Chicago Surface Lines' original application to the commission for authority to operate co-ordinated bus service over Diversey Avenue was opposed by the Chicago Motor Coach Company, which simultaneously petitioned for a similar privilege. The railway offered a 7-cent fare with free transfers to electric cars, while the bus company proposed to establish its regular 10-cent fare. The commission, however, overruled the bus company's petition and entered an order in favor of the Surface Lines. Thereupon the bus company appealed to the Superior Court which, in a decision handed down recently, upheld the Commerce Commission.

Since feeder bus service was started in Chicago by the Surface Lines a year ago on Diversey Avenue, numerous attempts have been made by Aldermen and civic organizations to have additional feeder bus routes established in various parts of the city. Ordinances giving the Surface Lines permission to establish service on many of these routes have been approved by the City Council on several occasions, but have never been enacted.

The corporation counsel has been instructed by the city to appear before the commission in the present hearings to help the Surface Lines obtain the necessary authority to establish feeder bus lines on approximately twelve different northwest side routes, ordinances for which were adopted recently by the City Council.

Staten Island Bus Case Adjourned

Argument on the application of the Richmond Railways, Inc., which operates six electric railway lines on Staten Island, for an injunction to restrain the Tompkins Bus Corporation from operating its eight lines of buses there, and also to restrain the South Beach and the Fox Hills companies from operating their lines, was adjourned on July 24 before Supreme Court Justice Byrne in Brooklyn to July 30.

The railway holds that the franchise specified that the two-zone system, with a 5-cent fare in each, was to go into effect within 90 days after operation began. It also maintains that the Tompkins Bus Corporation has not posted a liability bond for $50,000 as required, and that it has failed to put new equipment into service after operating the system for one year.

Meanwhile the Tompkins company announced on July 23 that beginning the next day it would put into effect a two-zone fare system, charging 5 cents for a ride through each zone instead of a flat rate of 10 cents to all points. The history of this case has been reviewed recently in Electric Railway Journal.

Reduced Rates and Increased Services on Mitten Tours

The growing popularity of Mitten Tours bus travel to the shore at Atlantic City has necessitated greatly increased service and an auxiliary terminal and waiting room at 1432 Market Street opposite the Broad Street Station in Philadelphia, Pa., and has made possible a new reduced round trip rate. The constantly increasing demand for more frequent service has changed the schedule from every hour and one-half to every hour. The round trip rate is $2, but the one-way fare remains at $1.25.

As an added convenience to its patrons an auxiliary terminal and waiting room was opened on July 23 beside the Mitten Bank. Here tickets and reservations can be purchased for all Mitten Tours lines, including Atlantic City, New York, Washington, Wilmington, Doylestown and Easton, Valley Forge and the two long-distance summer tours, Buffalo-Niagara and Montreal-Quebec. Chartered bus service is also obtainable at this location.

Interurban Service May Replace Lake Burien Line

Solution for the Lake Burien car line problem of the Seattle, Wash., Municipal Street Railway system, which has vexed city officials, county commissioners and Lake Burien residents for months, may result from a hearing set for Aug. 22 at the Chamber of Commerce before the State Department of Public Works. The hearing is to be on an application of the Suburban Transportation System, Seattle, for a certificate of public convenience and necessity, to establish a passenger and

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express service between Seattle and Lake Burien.

C. R. Jackson, superintendent of public utilities, told the City Council that if the state Department of Public Works grants a certificate to the Suburban Transportation System, the city will probably abandon the operation of its Lake Burien car line, which has been on a losing basis for a long time, and that there was not enough patronage for both services. He added that if the city continued this line, it was going to be compelled to shoulder an expense of close to $16,000 in the near future for replacements and improvements.

Permits for Camden-Atlantic City Service Denied

Heavy losses sustained by railroads in maintaining passenger service to Atlantic City was assigned by the Board of Public Utilities Commissioners of New Jersey as the reason for refusing to sanction the operation of buses between Camden and the shore resort by the Public Service Transportation Company.

The conclusions of the board dealt mainly with the situation confronting the Atlantic City Railroad, a part of the Reading System, and the West Jersey & Seashore, a subsidiary of the Pennsylvania. The commission said:

All the exhibits offered clearly indicate that the railroads are losing vast sums of money operating between Camden and Atlantic City. A considerable loss is caused by the continued increase in the number of privately owned automobiles and the continued increase in interstate bus transportation, which is without regulation and increases at will. Because of this situation, the railroads are maintaining service at a great loss, which will be increased by the addition of other transportation facilities.

The board quoted from a court decision to this effect:

The state assumes to regulate the rates for transportation and the character of the service rendered. Morally and legally it should protect the business of the established utility from impairment and encroachment. To do otherwise would soon creat a situation where the public would be without transportation service.

New Route in Massachusetts Announces Schedule

A bus service was scheduled for July 29, by the Springfield Street Railway to operate between Springfield and Palmer, Mass., and to take the place of the railway service, set to be discontinued on that date. Buses running from Springfield through Palmer to Ware and return will alternate with those running between Springfield and Worcester every two hours, thus providing an hourly service between Springfield and Palmer. Two short runs will be made each day between Ware and Palmer. Connections will be made at Palmer with buses for Monson, Three Rivers, Bondsville and Thorndike and through trips will be made between Springfield and Monson twice a day.

Thirty-nine Additional Buses on Newark Routes

The Board of Public Utility Commissioners of New Jersey on July 21 approved applications of the Public Service Co-ordinated Transport for authority to operate 39 additional buses on routes in and around Newark. On the Lyons Avenue route between Newark and Irvington seventeen buses will now be added.

There were 7,476,460 passengers carried on this route last year, a gain of more than 1,000,000 over preceding years. Thirteen additional buses are to be put on the crosstown route between Sixth Street and Heller Parkway and Lyons Avenue and Fabyan Place. This route carried 3,551,015 persons last year. The nine other buses are to be added to the Maple Avenue service between Newark and Hillside. This route handled 5,149,986 passengers in 1927.

Substitution on Old Springfield Line

The municipal transportation board of Springfield, Mass., has approved the Springfield Street Railway's plan to substitute a bus service for the electric line in use for many years on the Worthington Street route. This change, to be made in about two months, is incidental to the projected widening of Worthington Street. The question of removing the car tracks from Worthington Street is coming up for settlement.

Denver Tramway Uses Bus in Emergency

Precautionary measures have been taken by the city engineer of Denver, Col., and engineers of the Denver Tramway, which resulted in an edict closing, on 24 hours' notice to all traffic, the 23rd Street viaduct, an old wooden structure which spans a large area of railroad tracks and a small stream. Suspicion has been aroused that the structure was unsafe, although for many years there has been no occasion to raise any question about the matter.

The route of the Denver Tramway Line to Globeville, a densely populated eastside suburb, has been over the old wooden viaduct. The company now informs the public that from the Denver approach of this viaduct to the end of the Globeville line transfers will be issued which will be honored on buses the company has called into emergency service. While it will be impossible to cover the exact line, the bus will cover it as near as practicable.

Ordinance in Terre Haute Held Unreasonable

An ordinance of the city of Terre Haute, Ind., prohibiting buses from operating on the same streets with street cars and interurbans in that city was ruled void in an order written on June 23 by Howell Ellis, a member of the Indiana Public Service Commission. Mr. Ellis held that the ordinance was unreasonable and interfered with the petitioners' service to the public.

The case was filed in the name of the Blue & Gray Bus Lines and the Hoosier Transportation Company, Inc., against the city of Terre Haute.

Duplication of Service in Alabama Denied

Confronted with the question of whether a bus line should be permitted to duplicate the route an electric railway follows, the Public Service Commission of Alabama has granted the bus petition but has denied the motor carrier the right to duplicate the similar service of the railway. This question arose in connection with a petition filed with the commission by V. C. Hicks for a certificate to operate a bus line between Northport, Ala., and Holt, via Tuscaloosa, Alberta City and other intermediate points. This service, it is said, would duplicate that of the railway in Tuscaloosa and into Holt, and the Alabama Power Company, which operates the railway, intervened in the matter.

The Public Service Commission, in a report on the petition, grants the application for a certificate for the bus line, subject to certain conditions and restrictions which are, substantially, that the applicant may pick up passengers anywhere along the route if the destination is to some point more than a quarter of a mile distant from the railway line or he may pick up passengers along his route more than a quarter of a mile from the railway and discharge them at any point along his route.

In its report the commission holds that the principle that permits a bus and a railroad to operate on the same route does not apply as regards a bus and a street railway route. The commission gives notice that the applicant must keep his operations strictly within the terms and provisions of his certificate.

Would Operate Temporary Service in Long Beach

The Pacific Electric Railway has applied to the California Railroad Commission for a certificate of public convenience and necessity to operate a temporary auto stage service in the city of Long Beach, to and from the Pacific Southwest Exposition grounds.

Extension Sought in New Rochelle

The Country Transportation Company, subsidiary of the New York, Westchester & Boston Railway, applied to the Public Service Commission on July 17 for a certificate for the operation of an extension of its bus system in New Rochelle. According to the petition the proposed line will be operated as part of the bus company's main route from Dean Place to Stamford, Conn., the main-line buses traveling over the proposed extended route. New Rochelle

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has authorized the bus company to operate in the streets on the proposed extension.

New Line from Worcester Approved

The Worcester Consolidated Street Railway, Worcester, Mass., has been granted permission by the license board to use the city streets for a bus line from Worcester to Holden and Jefferson. The first petition of the Consolidated for this route was refused because it contemplated use of Main Street, which is opposed by the license authorities.

Extension of Service in Los Angeles

A certificate of public convenience and necessity has been granted by the California Railroad Commission to the Los Angeles Railway Corporation to operate motor coaches for the transportation of passengers from the intersection of Clarendon Avenue and Pacific Boulevard in the city of Huntington Park to the city of Los Angeles.

Permit for Old Illinois Line Sought

An application has been made by the East St. Louis & Suburban Railway to the Illinois Commerce Commission for a permit to operate buses over the Old Belleville-St. Louis road between Belleville, Ill., and St. Louis, Mo. The proposed new line will not interfere with the present bus service between St. Louis and Belleville over the Belleville rock road which parallels the street car line. The Old Belleville-St. Louis road was paved recently. It is some distance from the rock road.

Debating Over Car or Bus on Denver Line

Officials of the Denver Tramway, Denver, Col., are conferring with a committee of the Eighteenth Street Business Men's Club on supplying some form of transportation down Eighteenth Street. About two years ago the company abandoned its service in Eighteenth Street Broadway to the Union Depot, about 1 mile. The club is now agitating for the restoration of the cars or the installation of buses. Opinion appears to be divided on the merit of the two systems.

Track Removal in Asbury Ordered

The Coast Cities Electric Railway, Asbury Park, N. J., has been ordered by the Public Utilities Commission to remove its tracks at Asbury Park within 90 days. These were abandoned recently when buses were substituted by the railway for cars as part of its extensive service.

Financial *and* Corporate

Good Interborough Statement

Earnings and expenses of the Interborough Rapid Transit Company, New York, for the twelve months ended June 30, 1928, show, on the basis of the preferential deficits as computed by the company, a net balance of $3,021,582 after actual maintenance. This is a gain of $1,550,695 in net earnings over the previous fiscal year, accounted for chiefly by the absence of strike conditions as of July, 1926—the beginning of the previous fiscal year.

The statement calls attention to the fact that the Transit Commission has objected to certain expenditures by the company in prior years, aggregating about $7,000,000, and that these objections have not been adjudicated. In consequence the results are approximate and tentative, and subject to such readjustment as may be necessary by the final settlement of the objections made by the commission. It is indicated that such settlement may show a portion of the balance after actual maintenance payable to the city, thereby reducing the balance available to the Interborough system.

In any event whatever balance may finally accrue to the Interborough system must be reserved for or spent in payment of past due taxes, deferred payments on account of cars now in service, and to provide additional equipment for which no other funds are available. Therefore, no part of the balance is available to the Interborough stockholder as return on the investment.

St. Paul Southern Sold

Subject to approval by Judge W. A. Schultz, all of the property of the St. Paul Southern Railway was sold by Receiver C. B. Kuckler on July 16 at the Dakota County Court House to C. Rieger, St. Paul, for $30,250. The road has been in a receivership since February, 1918. The award was protested by Charles Davis, Minneapolis, who charged he had put in a bid at $30,750.

STATISTICS OF SOUTHERN PACIFIC ELECTRIC STREET AND SUBURBAN PASSENGER SERVICE, YEAR ENDED DEC. 31

	1927	1926
Average miles of road operated during year	65.33	74.52
Operating revenues*	$1,820,789	$2,019,968
Operating expenses	$2,463,293	$2,623,844
Net deficit from operations	$642,504	$603,876
Railway tax accruals	$157,520	$156,177
Motor car-miles	3,636,616	4,085,374
Motor car trailer-miles	886,063	932,098
Motor car train-miles	2,774,719	3,165,248
Passengers carried—revenue	24,759,927	27,100,620
Passenger-miles—revenue	121,001,587	126,751,099
Passengers per train	43.61	40.04
Average distance carried—revenue passengers	4.89	4.68
Revenue per passenger-mile, cents	1.485	1.581

Note:—*Includes revenues, other than passenger, amounting to $23,921 for 1927 and $15,719 for 1926.

The road just now sold operates between St. Paul and Hastings, running into the city from a point south of South St. Paul over the rails of the St. Paul City Railway.

Additional Rights to Class A Central Public Service Stock

Stockholders of the Central Public Service Corporation, Chicago, Ill., approved amendments on July 9 which vest full powers of participation in the future growth and earnings of the properties of the corporation in its class A stock. It is said the reclassification of the class A stock is only the first step toward a readjustment of the capital structure of the corporation in order to facilitate the financing of properties for growth.

Heretofore the class A stock has been limited to $2.50 a share annual dividends and $25 a share in the event of liquidation. As a result of the amendment, it had priority over the common stock to the extent of $1.75 a share yearly in dividends and $30 a share in liquidation, and will participate equally with the common stock when that stock has received a sum equivalent to the priorities of the class A stock. The company is a large owner of electric railway properties.

Funds Deposited in Chicago for Bond Payments

The Chicago City Railway and the Calumet & South Chicago Railway, comprising the south side divisions of the Chicago Surface Lines system, have deposited with the First Trust & Savings Bank, Chicago, funds for the payment on Aug. 1 of interest on the first mortgage 5 per cent gold bonds for the preceding six-months' period.

Underlying Companies in Philadelphia Protest City's Plan

Counsel for the companies which underlie the Philadelphia Rapid Transit Company, Philadelphia, Pa., filed replies on July 16 before the Public Service Commission at Harrisburg, opposing the plan of the city to purchase the properties.

The principal brief was prepared by Owen J. Roberts. It attacked the Daix Act of 1927, under which the proceedings are being conducted, and the whole plan in general as in violation of both the state and federal constitutions, and asked the commission to dismiss the city's petition. Mr. Roberts charged that the Daix Act confers condemnation powers for a purpose "other than a public improvement."

The brief complains that condemna-

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tion of the underliers' property and lines would violate property and contract rights guaranteed by the state constitution and that the Daix Act, although giving the city authority to take its present action, made no provision for ascertaining and paying the value of the property by the city.

Further, the present action, it is contended in the brief, would violate provisions of the state constitution which prohibit the Legislature from passing any law impairing the obligation of contracts and would likewise violate the federal constitution by depriving the underliers of property "without due process of law."

The city wants to assume ownership of the companies, and so receive from the Philadelphia Rapid Transit Company the fixed rentals now paid to them. Besides paying interest and sinking fund charges on a bond issue to cover the purchase, it has been estimated the city treasury would receive approximately $4,000,000 annually.

The hearing has been continued until July 31 at the request of the counsel for the companies that owing to the vast amount of work necessary in preparation of their case, they were not prepared as yet to submit any testimony to the commission nor to cross-examine any of the city's witnesses.

Dividend Passed

Directors of Union Street Railway, New Bedford, Mass., have voted to pass the $1.50 quarterly dividend due at this time, the recent textile strike having so affected earnings that the dividend was not earned in the past quarter.

Historic Pennsylvania Property Passes Into New Hands

The Allentown & Reading Traction Company, which has a terminus at Center Square, Allentown, and also in Reading, Pa., and which has for many years been operated between the seats of the neighboring counties, has just been sold to Marshall V. Robb, of Indianapolis, Ind., well known in the public utility business in the Middle West, who will continue to operate the road. Negotiations for purchase of the railway property have been in progress for the past year, and it is said that more than $750,000 in securities are involved. Included with the property are about 40 miles of railway as well as the Fleetwood and Kutztown Light, Heat & Power Company.

With the completion of the sale, the new officers are as follows: Marshall V. Robb, Indianapolis, president; Judge Edgar S. Richardson, Reading, vice-president; Francis S. Kinsey, Reading, secretary, and Milton Heffner, superintendent. The offices of the company, which have been maintained at 121 North Fifth Street, Reading, will be continued.

The company has 36 cars in service and maintains an hourly schedule between Reading and Allentown. There is at present a half-hour service between Allentown and Wescoesville, and two cars run every five minutes between Allentown and Dorney Park on Saturday and Sunday. The Dorney amusement park, near Allentown, on which Robert Plarr and R. J. Rush have a long-term lease, is owned outright by the railway company. The park adds to the railway traffic, especially from the Allentown end of the road, while as a picnic center, it is also well patronized from Kutztown and other nearby spots. From Reading to Temple, the cars are operated over the lines of the Reading Transit Company. Power for the lines is purchased from the Metropolitan Edison Company, which also supplies power to the Fleetwood and Kutztown Electric Light, Heat & Power Company.

The Allentown & Reading Traction Company has a remarkable history among the transportation systems of the country. The line was opened from Allentown to Wescoesville in 1900. Three years later, the road was extended to Temple and run into Reading. The late H. E. Ahrens, father of William B. Ahrens, a member of the board of directors, was president of the company from 1904 to 1918. At his death, George B. Schaeffer was elected president, and has served continuously ever since. F. S. Kinsey, who became secretary of the company, has been in charge of the Reading office since 1902, and Milton H. Heffner, superintendent, has been with the road since 1901.

Southeastern Buys Properties

The Southeastern Power & Light Company is reported to be acquiring the controlling interest in the Augusta-Aiken Railway & Electric Corporation and the Georgia-Carolina Power Company. F. B. Culley, general manager of the two concerns being absorbed, would reveal none of the financial details but stated that "stabilization of power service in all cities and towns served" was contemplated.

Conspectus of Indexes for July, 1928

Compiled for Publication in Electric Railway Journal by

ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Last 5 Years High	Last 5 Years Low
Street Railway Fares* 1913 = 4.84	July 1928 **7.64**	June 1928 **7.62**	July 1927 **7.52**	July 1928 **7.64**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	July 1928 **141.8**	June 1928 **141.4**	July 1927 **142.9**	April 1923 **175.3**	Feb. 1928 **139.5**
Electric Railway Wages* 1913 = 100	July 1928 **229.2**	June 1928 **229.2**	July 1927 **227.8**	May 1928 **229.2**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost Elec. Ry.) 1913 = 100	July 1928 **202.3**	June 1928 **202.7**	July 1927 **199.9**	March 1924 **206.8**	Jan. 1923 **187.3**
Eng. News-Record Construction Cost (General) 1913 = 100	July 1928 **206.6**	June 1928 **206.2**	July 1927 **203.7**	March 1924 **224.7**	Nov. 1927 **202.0**
U.S. Bur. Lab. Stat. Wholesale Commodities 1926 = 100	June 1928 **97.6**	May 1928 **98.6**	June 1927 **93.8**	March 1925 **104.8**	April 1927 **93.7**
Bradstreet Wholesale Commodities 1913 = 9.21	July 1928 **13.14**	June 1928 **13.19**	July 1927 **12.38**	Dec. 1925 **14.41**	July 1924 **12.23**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	June 1928 **152.6**	May 1928 **153.8**	June 1927 **158.5**	Nov. 1925 **167.1**	May 1924 **141.0**
Cost of Living Nat. Ind. Conf. Bd. 1914 = 100	June 1928 **160.9**	May 1928 **161.5**	June 1927 **164.8**	Nov. 1925 **171.8**	Feb. 1923 **157.5**
Industrial Activity Elec. World—Kw.-hr. used 1923-25 = 100	June 1928 **116.4**	May 1928 **119.0**	June 1927 **112.5**	Feb. 1928 **127.7**	July 1924 **73.4**
Bank Clearings Outside N. Y. City 1926 = 100	June 1928 **104.5**	May 1928 **108.4**	June 1927 **101.1**	May 1928 **108.4**	Aug. 1923 **81.6**
Business Failures Number	June 1928 1615	May 1928 1748	June 1927 1688	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	**44.73**	**36.64**	**49.66**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

Lincoln Equipment Sold

Equipment of the municipally owned railway at Lincoln, Ill., has been sold for $3,500 to Morris Tick Company, Bloomington, Ill., and will be removed within 45 days, according to terms of the sale. The equipment offered included trolley wires, street cars, poles and tracks on unpaved streets. Rails on the paved streets will be sold later. Railway service was suspended on May 15.

Hearing on Substitution on Illinois Line

A commissioner of the Illinois Commerce Commission conducted a public hearing on July 23 at O'Fallon, Ill., on the application of the East St. Louis & Suburban Railway to discontinue railway service and substitute buses connecting St. Louis, O'Fallon and Lebanon, Ill.

Would Abandon Freight Car Service in Ohio

The Columbus Railway, Power & Light Company, Columbus, Ohio, has petitioned the State Public Utilities Commission for permission to abandon the freight car service maintained be-

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tween Columbus and Westerville. Residents of Westerville are preparing to make protests. Some time ago the Westerville Village Council refused to ratify a contract with the Buckeye Stages, Inc., for bus service to the community largely on the grounds that the bus company could not duplicate the freight service of the Columbus Railway, Power & Light Company, which remains the sole agency other than the Pennsylvania Railroad then providing transportation.

The railway alleges in its petition that the freight service which influenced the Westerville Council in its action is unprofitable and could be handled satisfactorily by the railroad. Westerville is 15 miles from Columbus.

Decrease in Net Earnings in Twin Cities

A decrease of $164,205 in the net income of the Twin City Rapid Transit Company, Minneapolis, Minn., for the year ended Dec. 31, 1927, over a similar period ended in 1926 was revealed in the annual report of the company submitted by Horace Lowry, president. In 1927 the net income was $1,272,600 compared with $1,436,805 for the year 1926. The continued falling off in traffic is seen as the reason for decreased revenues. In 1927 a total of 177,319,024 revenue passengers were carried against 185,711,950 carried the year previous. The balance on Jan. 1, 1927, was $1,962,905 and additions for the year were $1,272,600. The balance carried forward was $3,235,505.

CONSOLIDATED INCOME STATEMENT OF THE TWIN CITY RAPID TRANSIT COMPANY

	1927	1926
Revenue from transportation	$13,287,479	$13,825,851
Revenue from other operations	138,164	119,415
Total operating revenue	$13,425,643	$13,945,266
Way and structures	$1,198,583	$1,201,892
Equipment	1,052,105	1,106,303
Power	1,045,878	1,198,256
Conducting transportation	4,401,568	4,475,622
Traffic	48,261	46,492
General and miscellaneous	1,163,657	1,217,687
Transportation for investment—credit	—39,028	—39,544
Motor bus expense	1,088,945	1,115,778
Total operating expenses	$9,959,972	$10,322,488
Net operating revenue	$3,465,671	$3,622,778
Taxes assignable to operation	1,254,792	1,229,115
Operating income	$2,210,878	$2,393,662
Net income miscellaneous physical property	$7,128	.....
Income from unfunded securities and accounts	49,192	50,199
Miscellaneous income	7,608	6,298
Total non-operating income	$63,929	$56,498
Gross income	$2,274,808	$2,450,161
Rent for leased roads	$3,000	$3,000
Interest on funded debt	991,601	995,520
Interest on unfunded debt	565	5,887
Miscellaneous debits	7,040	7,311
Net loss miscellaneous physical property	.....	1,636
Total deductions from gross income	$1,002,207	$1,013,355
Net income transferred to profit and loss	$1,272,600	$1,436,805

During 1928 there will mature $15,000,000 of the bonds of the Minneapolis Street Railway and of the St. Paul City Railway, $5,000,000 on Aug. 15, and $10,000,000 on Oct. 1, 1928. The board of directors felt that advantage should be taken of the favorable money market during December, 1927, and arrangements were made for refunding these bonds. At a special meeting held Nov. 16, 1927, the directors after full consideration, by unanimous vote of all present, authorized the sale of $18,000,000 par value of first lien and refunding 5½ per cent gold bonds of the Twin City Rapid Transit Company, dated Dec. 1, 1927, and due Dec. 1, 1952, secured by the pledge of an equal aggregate amount of first and refunding mortgage 5½ per cent gold bonds of the Minneapolis Street Railway and refunding mortgage 5½ per cent gold bonds of the St. Paul City Railway. The net proceeds from the sale of these bonds in excess of the amount required for the redemption of the bonds maturing in 1928 will be used for the future requirements of the company.

During the year the Twin City Motor Bus Company further unified its operations and with the new garages and improved shop facilities, Mr. Lowry says, is now on an economical operating basis.

STATISTICAL STATEMENT OF THE TWIN CITY RAPID TRANSIT COMPANY

Track miles, all track reduced to single track	511.81
Total car miles operated	29,136,626
Gross passenger car revenue	$12,068,273
Revenue passengers carried	177,319,024
Transfer passengers carried	65,784,323
Revenue passengers per car-mile	6.09
Total passengers per car-mile	8.34

ADDITIONS AND RETIREMENTS OF TWIN CITY RAPID TRANSIT COMPANY
1927

Additions:	
Way and structures	$492,182
Equipment	363,725
Power	40,183
General and miscellaneous	36,597
Boats, park and real estate properties	—481
Bus plant and equipment	270,908
Total additions	$1,203,116
Retirements:	
Way and structures	$165,044
Equipment	148,548
Power	15,250
Bus plant and equipment	149,749
Total retirements	$478,592
Net additions	$724,523

Detroit United Sale Set for Sept. 5

An order for foreclosure of mortgages amounting to approximately $11,000,000 and for the sale at public auction of the properties of the Detroit United Railway, Detroit, Mich., was issued on July 25 by Federal Judge Charles C. Simmons. The order was applied for by the Union Trust Company, Detroit, and the Central Union Trust Company, New York. The sale was set for Sept. 5.

Short Abandonment in Utica Approved

The Public Service Commission on July 20 approved abandonment by the New York State Railways of two parts of its line in Utica.

Loss Reported by Peninsular Railway

The Peninsular Railway, operating in San Jose, Los Gatos, Palo Alto and vicinity, reports to the California Railroad Commission its 1927 operating revenue at $242,722 compared with $248,616 for 1926. Operating expenses, excluding taxes for 1927 are reported at $420,372, and at $327,257 for 1926, leaving a net operating revenue a loss of $177,649 for 1927 compared with a loss of $78,640 for 1926. During 1927 taxes charged to operation amounted to $11,861 and for 1926 to $12,312. Deducting the taxes leaves operating income a loss of $189,511 for 1927 compared with a loss of $90,952 for 1926. Adding to the operating income, the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income, (which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus), a loss of $152,636 for 1927, and a loss of $51,295 for 1926.

Increase in Passenger Traffic in Glasgow

Glasgow Corporation Tramways, for the year ended May 31, reports as follows:

	1928	1927
Traffic receipts	£2,380,763	£2,340,837
Other receipts	5,165	4,370
Total income	£2,385,929	£2,345,207
Working expenses (excluding depreciation)	1,660,055	1,676,417
Balance carried to net revenue account	£725,874	£668,790
Interest on investments	85,876	75,020
Balance	£811,749	£743,810

From these sums there were deducted for interest, sinking fund, income tax, parliamentary expenses, depreciation and renewals, in 1928, £764,803, and in 1927, £776,988, giving a surplus in 1928 of £46,946 and a deficit in 1927 of £33,178. The subway and buses showed a deficit each year. When this deficit was deducted from the balance previously given, the final net surplus in 1928 was £19,754 and net deficit in 1927 was £78,632. The passengers carried increased from 419,970,823 in 1927 to 466,142,258 in 1928.

On May 31, 1928, the tramways had 131 miles of double track and 5 miles of single track, 1,089 passenger cars and 43 buses. Other buses were on order, including 100 double-deck buses ordered on April 26, 1928. On May 31, 1928, the traffic department had 4,417 male employees and 206 female employees. The rate of pay for the male motormen and conductors was 56 shillings a week during the first year, increasing to a maximum of 64 shillings in the fifth year. The women conductors were paid 53 shillings a week during each year.

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Personal Items

Changes in Pittsburgh Line-Up

Promotions on the Pittsburgh Railways and Pittsburgh Motor Coach Company, Pittsburgh, Pa., are as follows:

Thomas E. Alderdice, formerly superintendent of shops of the railways, now superintendent of equipment Pittsburgh Motor Coach Company.

Richard C. Gilmartin from the position of special coach representative to superintendent of motor coach transportation.

Kenneth W. McPherson, formerly engineer of power equipment, Pittsburgh Railways, to superintendent of shops.

Daniel H. Bell from supervisor of construction to engineer of power equipment in the railways.

Thomas E. Alderdice has a background of nineteen years of varied experience with the railway companies.

T. E. Alderdice

He started with the Pittsburgh Railways in October, 1909, holding various positions and beginning in 1924 a series of five yearly successive steps as foreman of the machine shop, superintendent of the Homewood shop, superintendent of maintenance, superintendent of all shops, and finally to this new position.

R. C. Gilmartin went with the Pittsburgh Motor Coach Company on May 1, 1927, after six years' service with the United Electric Light Company at Wilmerding, Pa. He attended Duquesne University.

K. W. McPherson, who succeeds Mr. Alderdice, started with the railways as drill-press hand at the Homewood shop in 1914. Some years later he was appointed engineer of all four inclines operated by the railways. In 1921 he was promoted to the office of superintendent of inclines, where he served until 1925, when returned to the street-car end of the business to be engineer of car equipment. Mr. McPherson is a civil engineer of the class of 1909, Cornell University.

Daniel Bell, who replaces Mr. McPherson, began his employment with the Pittsburgh Railways as student draftsman in January, 1920. He was graduated from the University of Pittsburgh in mechanical engineering. In 1922 he was made instructor of the mechanical department at the Homewood shop, and then served successively as engineering inspector, chief inspector, supervisor of overhaul, and supervisor of construction.

Announcement of the appointments of Messrs. Alderdice and Gilmartin was made by T. W. Noonan, general manager of the Pittsburgh Motor Coach Company.

Changes in Brazil

C. A. Sylvester, for many years general manager of The Rio de Janeiro Tramway, Light & Power Company, Ltd., of Brazil, South America, has been elected a director and vice-president.

J. M. Bell, for many years connected with the subsidiary companies, and more recently assistant general manager of The Sao Paulo Tramway, Light & Power Company, Ltd., Sao Paulo, Brazil, has been appointed general manager succeeding Mr. Sylvester.

Promotion for L. A. Magraw

L. A. Magraw, vice-president and general manager of the Macon Railway & Light Company, Macon, Ga., has been elected vice-president and general manager of the South Carolina Power Company Charleston, S. C. B. R. Chestney has been elected to succeed him at Macon.

Changes in Key System Officers

Following a meeting of the board of directors of the Key System Transit Company, Oakland, Cal., held on July 26, it was announced that W. R. Alberger had resigned as a director of the company and that his resignation had been accepted.

Another announcement was the retirement of Frank W. Frost as secretary-treasurer. He is one of the oldest Key System officials in years of service.

Angus Clark, assistant under Mr. Frost, is the new secretary-treasurer. Mr. Clark also was elected a director, to succeed Mr. Alberger.

Mr. Alberger was formerly vice-president and general manager of the railway, but gave way to George W. Harris three years ago, though retaining his directorship. He was connected with the company for twelve years. Mr. Harris resigned a year ago and the position he had filled was abolished.

The changes are in line with the new policy of the company, now controlled by the San Francisco brokerage firm of J. Barth & Company, of electing active officers of the Key System as members of the board of directors.

Engineer in Automotive Field

Of interest to the electric railway industry as well as the automotive and industrial fields, is the recent affiliation of Harold T. Heath with James A. Carson, of the Timesaver Products Company, Chicago, Ill. The company produces a compound called "Timesaver," for the finishing of bearing surfaces and employed largely in the automotive and industrial fields.

Mr. Heath is better known in Mid-Western railway circles. He entered the employ of the Westinghouse Electric & Manufacturing Company and served in the railway, engineering, and sales departments until 1917, when he went with the Economy Electric Devices Company. Four years later he took over the management of the Heath Drug Company, founded by his father. In 1925 Mr. Heath became associated with the National Railway Appliance Company as general manager of the Chicago office, the Hegeman-Castle Corporation, as the concern is known locally. For a time following this, he

H. T. Heath

was associated with E. J. Hunt of the Detroit Railway Supply Company. More recently he has been with the Illinois Motive Equipment Company as sales engineer.

Mr. Heath was graduated from the Ohio State University in 1911, with the degree of mechanical engineer in electrical engineering.

J. J. Esch to Practice Law

J. J. Esch, who recently retired as a member of the Interstate Commerce Commission, has become associated with a new law firm, Esch, Kerr, Newton & Shipe, for the general practice of law before the departments and commissions at Washington, D. C. Associated with him will be Charles Kerr, former judge of the circuit court at Lexington, Ky., and of the United States Court at Panama; A. K. Shipe, former special assistant to the attorney general of the United States; Cleveland A. Newton, general counsel of the Mississippi Valley Waterways Association; Marion C. Early, and Robert W. Woolley, also a former member of the Interstate Commerce Commission.

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E. B. Katté

New York Central official had done much to advance the technical arts, particularly the application of electricity to heavy railroading

EDWIN B. KATTÉ, chief engineer of electric traction of the New York Central Railroad, died at his home in Irvington, N. Y., on July 19, after an illness of more than a year. He had held the position of chief engineer of electric traction with the New York Central since November, 1906, and in that capacity he had charge of the design, construction and operation of the electric traction installation of the company in and about the city of New York. Previously, he had been electrical engineer and secretary of the electric traction commission of the New York Central Railroad, to which position he was appointed in December, 1902. In this capacity, under the direction of the commission, he had immediate charge of the electrical and mechanical engineering corps engaged upon the work of electrification of the various lines of the company in New York City and the vicinity.

Mr. Katté was born in St. Louis, Mo., on Oct. 16, 1871. He was the son of the late Colonel Walter Katté, a distinguished civil engineer. E. B. Katté was graduated from Sibley College, Cornell University, in 1893, with the degree of mechanical engineer, and after a post-graduate course, received from that institution in 1894, the degree of master of mechanical engineering. After a short term of service with H. R. Worthington, Mr. Katté became assistant engineer in charge of the erection of the superstructure of the Park Avenue viaduct of the New York Central Railroad. Later he was appointed mechanical engineer in the engineering department of the company and in this capacity had a great deal to do with the design and installation of numerous coaling stations, water supply stations, electric light and power plants for small passenger and freight stations, etc. It was the high grade of work done in this capacity and his knowledge of electrical engineering which led to his appointment as engineer and secretary of the electric traction commission, when it was decided to equip the New York Terminal for electric operation, as mentioned.

Mr. Katté always took an interest in association activities. He was vice-president of the Society of Mechanical Engineers in 1913-1914, and also served a term as manager. He was a fellow of the American Institute of Electrical Engineers and had served on the railroad committee of that body. With the American Electric Railway Association, he served on the heavy traction committee, the committee on standards, and the committee on electrolysis. With the American Railway Engineering Association, he served one term as director and for nine years was chairman of its committee on electricity; with the American Railway Association as a member of the committee on electrical

E. B. Katté

working; with the New York Railroad Club as chairman of its electrical committee and with the New York Electrical Society as president for one term and vice-president for several terms.

During the war, Mr. Katté was chief engineer of electric traction for the United States Railroad Administration, and from 1917 to 1919, he was a major in the Engineer Officers Reserve Corps of the United States Army.

Captain Alfred Loewenstein

Following the war there flashed in the financial skies of Europe several individuals whose stars seemed to be of first magnitude. It appeared to be their opportunity and they seized it. But ambition to attain an office and the ability to fill it are two very different things, forcefully illustrated in the case of this latest triumvirate, from Roumania, Germany and Belgium, to the last of whom the world has given its *coup de grâce*. Reference is made, of course, to Captain Alfred Loewenstein, the spectacular Belgian financier and man of mystery, the finding of whose body has removed all doubts about his recent disappearance.

To the American people he was a newspaper-made Midas. Little was known of him here until he came to this country several months ago, heralded by the press as richer than Rockefeller or Ford. His personal attire, his numerous secretaries, his squad of motor cars, unusually large telephone and cable charges, all were minutely described as peculiarities that can be attributed only to extreme wealth and the habits of a man of big affairs. For a time he appeared to loom large here on the public utility horizon, but only for a time. So meteoric was the rise of the star of this man that his passing cannot be dismissed with just a line or two. As the *Financial World* said of him:

> The tragic fate that has overcome him again brings to the fore the fact that supermen are no more immune from disaster when they undertake more than the average human mind can master than is the common run of mankind. That was Captain Loewenstein's chief weakness. Intoxicated by his success as a promoter and exploiter, he foolishly thought, as did Napoleon, that there were no worlds he could not conquer. It is not possible to run a one-man band and make it as symphonious as a full orchestra. It is best and safest to do one thing at a time and do that well.

Equally significant is the penetrating comment of the conservative *Commercial and Financial Chronicle*, which, under the heading, "The Dizzy Heights of Finance," said among other things:

> The sudden, spectacular and tragic death of Alfred Loewenstein, European financier, master of millions, suggests a phase of the responsibility of wealth not often considered. Indeed, there is a sort of symbolism in this death that raises the thought of its inevitability. Here was a man who rose rapidly to the dizzy heights of finance, wherefrom there is no escape save by a sudden return to the solid earth of lowly things. He lived like a prince. He engaged in the game of great combinations of capital. From height to height he climbed, forgetting to mark the pathway for a safe descent, and when there were no more heights to climb, and the rarefied air was insufficient to sustain the life of new and larger enterprises, he fell—and carried thousands of innocent investors down to the plains of hard work—himself the victim of overweening ambition, whether death was accidental or otherwise.

The *Chronicle* also delivered itself of this homily:

> Combinations of corporations must be so close, so firm, so fitted to the purpose of human service, that one man's death will not affect their usefulness or standing. Real restraint begins with the restraint of ambition. Few men are fitted for this aggrandizement of power. Mere ability to organize and combine is not a test. The true test is fitness of the enterprise to sustain itself on its own merits by service.

Sir Thomas White has been elected to the Mexican Light & Power Company board and C. D. Magee to the board of the Mexico Tramways to succeed Captain Loewenstein. Both are residents of Toronto.

William Pestell

William Pestell, vice-president and sales manager of the Riley Stoker Corporation, Worcester, Mass., died on July 10. Mr. Pestell was stricken while on a business trip, being found dead in his Pullman berth as the train was entering New Orleans.

Since 1914 he had been employed by the Riley Stoker Corporation, first as district manager, then as sales manager, and since 1927 as vice-president. Before going with the Riley Stoker Corporation, he was superintendent of power for the Lynn & Boston Street Railway, Boston, Mass., and superintendent of the power houses of the Rhode Island Company at Providence. He was connected for several years with the Allis-Chalmers Manufacturing Company at Boston, and the J. G. White Engineering Corporation in New York. He also served as superintendent of power of the Worcester Consolidated Street Railway, Worcester, Mass. He was born in Rutland, England, 56 years ago.

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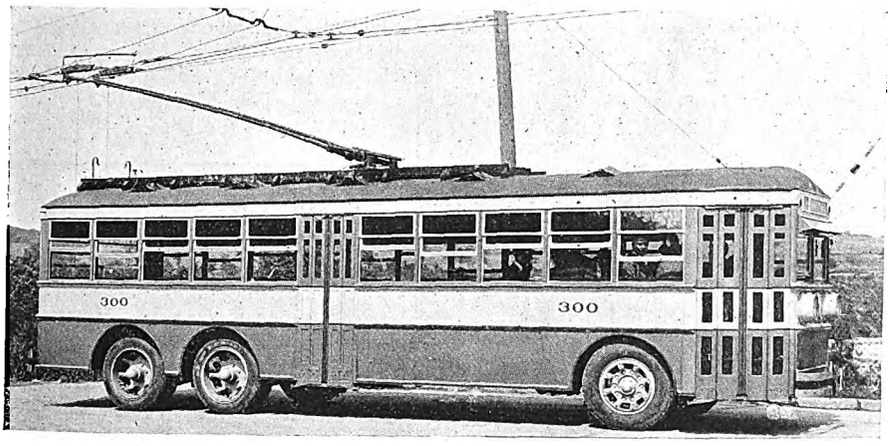
Manufactures and the Markets

Electric Coach for Salt Lake City Tested

One of the ten electric coaches built for the Utah Light & Traction Company by the Versare Corporation, Albany, N. Y., was given an operating test on July 23 under the personal supervision of E. A. Boyd, superintendent of equipment of the Salt Lake City company. The test was made to check the actual performance of the vehicle. It was conducted in Cohoes, N. Y., over trackless trolley lines of the Capital District Transportation Company, bus operating subsidiary of the United Traction Company, Albany, N. Y. Use of the lines was made possible through the courtesy of Ernest Murphy, general manager of the latter company.

The streets over which the vehicle was driven are very hilly and in certain districts quite rough. One of the hills along the route of the test is approximately a mile long, with an average grade of about 7 per cent and a maximum grade of 10 per cent. In the downtown section of Cohoes the streets are quite narrow and many sharp turns had to be made. According to those who witnessed the trial, the vehicle met every expectation and performed in a very satisfactory manner.

The first coach will be shipped to Salt Lake City during the first week in August and the other nine a few days later. All are expected to be in operation before the end of August.



Citizens of Salt Lake will soon ride in vehicles of this type on some lines

R. E. Miller General Engineer of Westinghouse Air Brake

Raymond E. Miller, assistant chief engineer of the Westinghouse Air Brake Company at Wilderming, Pa., has been appointed general engineer of the company, succeeding the late F. H. Parke. Mr. Miller is well known in the railway industry through his connection with the Westinghouse Air Brake organization for the past 22 years. He entered the company's service as a special apprentice immediately after his graduation as an electrical engineer from the Michigan University in 1906. During the succeeding years he advanced rapidly until he was appointed assistant chief engineer in 1926. His work has largely been devoted to air brake trials and tests of newly developed brake improvements.

New Stone & Webster Affiliation Includes McClellan & Junkersfeld

The Stone & Webster Engineering Corporation has been formed with a capitalization of $9,500,000, to take over from Stone & Webster, Inc., its construction and engineering business and its interest in Ulen & Company. The new company also has acquired from the North American Company its engineering and construction company known as McClellan & Junkersfeld, Inc., thereby widening the scope of the construction work of the new Stone & Webster subsidiary.

As a result of this segregation of its engineering work, the Stone & Webster organization will be more directly concerned with the management and ownership of public utility companies.

G. O. Muhlfeld has been elected president of the new company.

Motor Equipments from Westinghouse for Three Installations

The Pacific Electric Railway, Los Angeles, Cal., has ordered equipments from the Westinghouse Electric & Manufacturing Company for ten new all-steel cars for the Hollywood line. Each equipment consists of four Westinghouse type 532 motors, 50 hp., and HL control arranged for multiple-unit operation. These equipments duplicate a total of 150 equipments that have been ordered within the past six years by the Pacific Electric.

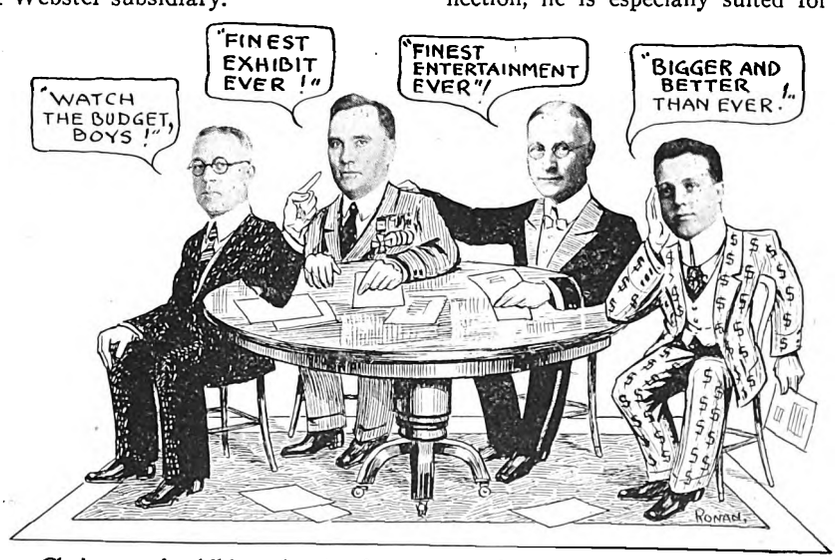
The Delaware Electric Power Company, Wilmington, Del., has ordered five quadruple equipments of Westinghouse 510 motors and double-end K-35 control for new cars as announced in ELECTRIC RAILWAY JOURNAL for July 14. The motors are equipped with oil-sealed housings.

Eight quadruple equipments of type 567-C-9, 150 hp., motors and HLF control have been ordered by Osaka Denki Kido KK of Japan for multiple-unit motor cars.

Redrow Appointed on Patent Board of Appeals

Walter L. Redrow has been designated by the President to be examiner-in-chief and member of the Patent Office Board of Appeals. He succeeds the late Sidney F. Smith. While serving as an examiner in the Patent Office, Mr. Redrow has had experience in those classes of invention involving metallurgy, electro-chemistry and other particular chemical subjects such as paper, rubber, glass and the ceramic arts.

Because of his experience in that connection, he is especially suited for the



Chairmen of exhibit and entertainment committees get busy with final plans

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Board of Appeals, which receives the most vigorously contested cases, which, in turn, usually become the most involved as to differences of opinion and close distinction in points of fact.

Campbell Joins Paving Brick Association

Quincy A. Campbell has been appointed acting secretary and assistant to the managing director of the National Paving Brick Manufacturers Association.

In 1921, Mr. Campbell entered the Ohio Department of Highways as an assistant engineer, being later appointed assistant division engineer at Ravenna, Ohio. In 1927 he was promoted to the position of assistant chief engineer of maintenance, which position he has resigned to enter upon his present duties.

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

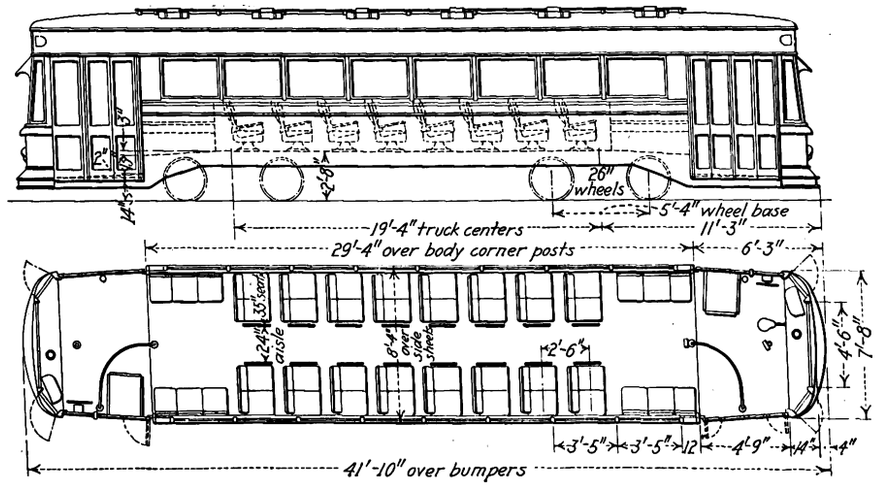
Metals—New York	July 24, 1928
Copper electrolytic, cents per lb	14.527
Copper wire, cents per lb	16.625
Lead, cents per lb	6.20
Zinc, cents per lb	6.57
Tin, Straits, cents per lb	48.00
Bituminous Coal, f.o.b. Mines (July 17)	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.15
Somerset mine run, f.o.b. mines, net tons	1.825
Pittsburgh mine run, Pittsburgh, net tons	1.8
Franklin, Ill., screenings, Chicago, net tons	1.55
Central, Ill., screenings, Chicago, net tons	1.325
Kansas screenings, Kansas City, net tons	2.25
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.3
Weatherproof wire base, N.Y., cents per lb.	17.125
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.6
White lead in oil (100-lb. keg), N. Y., cents per lb	13.25
Turpentine (bbl. lots), N. Y., per gal	$0.605

Specifications on Ten Cars for Delaware Electric

Delaware Electric Power Company, Wilmington, Del., has ordered ten one-man, two-man, city, passenger cars from the J. G. Brill Company. Announcement of the request for bids was mentioned in the June 16 issue of the JOURNAL.

The cars are of the double-end, double-truck type and seat 44 passengers. They are 41 ft. 10 in. long, 8 ft. 4 in. wide and weigh 36,640 lb. The bodies are of semi-steel construction with arch roofs and folding end doors.

The exterior finish is in orange, cream and red enamel with the interior in light mahogany. Two mirrors will be mounted in the vestibule above the operator's position, giving him a view of the car interior. Two pedal-operated and two air-operated sand boxes will be installed in each car. Further details are given in the accompanying specifications.



Plan of one of the new cars being built for the Delaware Electric Power Company

Date of order	July 1, 1928	Gears and pinions	Noiseless
Date of delivery	Oct. 20, 1928	Glass	Non-shatterable
Weights:		Hand brakes	Peacock staffless
Car body	17,300 lb.	Heat insulating material	Celotex
Trucks	10,000 lb.	Heaters	Consolidated truss plank
Equipment	9,340 lb.	Headlights	Keystone incandescent
Total	36,640 lb.	Headlining	Agasote
Bolster centers	19 ft. 4 in.	Interior trim	Light mahogany
Length over all	41 ft. 10 in.	Journal bearings	Plain
Length over body posts	29 ft. 4 in.	Journal boxes	Brill M.C.B.
Truck wheelbase	5 ft. 4 in.	Lamp fixtures	Ivanhoe indirect dome
Width over all	8 ft. 4 in.	Motors	Four Westinghouse 510 and GE-265, outside hung
Height, rail to trolley base	10 ft.	Painting scheme	Orange, cream, red
Window post spacing	41 in.	Roof material	Haskelite veneer
Body	Semi-steel	Sash fixtures	Curtain Supply Company
Roof	Arch	Seats	Brill, biscuit back reversible
Doors	End, folding	Seat spacing	2 ft. 6 in.
Air brakes	Westinghouse	Seating material	Genuine leather
Armature bearings	Plain	Slack adjusters	Brill
Axles	Brill	Step tread	Norton
Car signal system	Faraday high voltage	Trolley catchers	Earll
Compressors	Westinghouse DH-16	Trolley base	Ohio Brass
Conduit	Flexible	Trolley wheels	Feist Ohio Brass
Control	K-35	Trucks	Brill
Destination signs	Hunter	Ventilators	Brill
Door mechanism	National Pneumatic Company	Wheels, type	Steel, 26 in. diameter
Finish	Enamel		
Floor covering	Flexolith		

$300,000 Order in Toledo

Twenty-seven buses costing $300,000 have been purchased by the Community Traction Company, Toledo, Ohio, and others will be bought on the basis of their performance in the motorization of several lines. The Yellow Coach division of General Motors obtained a contract for twelve; White Motors Corporation, six; Twin Coach Corporation, six, and International Truck Company, three.

ROLLING STOCK

PLYMOUTH & BROCKTON STREET RAILWAY, Plymouth, Mass., has received five Mack four-cylinder, 29-passenger, city type buses.

TENNESSEE ELECTRIC POWER COMPANY, Chattanooga, Tenn., has received three urban type Twin Coach buses.

BOSTON ELEVATED RAILWAY, Boston, Mass., received ten 28-ft. Gas-Electric drive urban type Twin Coaches.

TORONTO TRANSPORTATION COMMISSION, Toronto, Canada, has ordered ten Mack six-cylinder, 232-in. wheelbase, bus chassis. The Bender Body Company will furnish the bodies.

TRADE NOTES

HEYWOOD WAKEFIELD COMPANY, Boston, Mass., has appointed George E. Cornwall, supervisor of its railway sales division.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has elected as honorary vice-president, J. R. Lovejoy, vice- president, who has served the company 42 years; George F. Morrison, vice-president associated with the company 45 years, and B. G. Tremaine, one of the organizers of the national lamp division. All three will continue to function as directors and will retain their association with the several departments of the company's activities with which they have been so closely identified. T. W. Frech, manager of the incandescent lamp department, has been elected vice-president in charge of the incandescent lamp department, and Dr. W. R. Whitney, director of the research laboratory, has been elected a vice-president of the company and director of research.

ADVERTISING LITERATURE

LINDE AIR PRODUCTS COMPANY, New York, N. Y., has issued a booklet, "Oxwelded Industrial Piping." It describes and explains with illustrations, economies in construction, repair and maintenance of oxwelded pipe systems.

PAGE STEEL & WIRE COMPANY, Bridgeport, Conn., has issued a new booklet covering the Page preformed strand. Copies of the booklet will be mailed on request.

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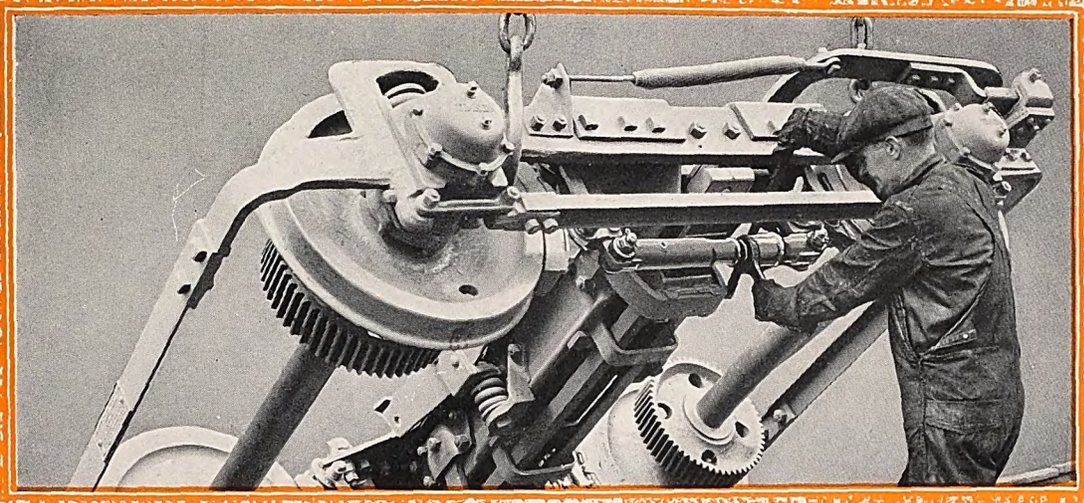

Disassembly Unnecessary in Reshoeing

The Brill Mechanical Slack Adjuster makes adjustment direct to the brake rod thus avoiding any change in the angularity of the brake levers. As the brake shoes wear, the slack adjuster crank on the live lever turns the ratchet housing and the accompanying ratchet which slightly revolves the brake rod and lengthens it, maintaining the brake shoes in the proper position.

The ratchet feature prevents slippage and facilitates the installation of new shoes as illustrated. The ratchets are separated by hand and the brake rod shortened by turning the hexagonal section with a wrench.

The slack adjuster can be installed on all double trucks and on single trucks if the brake rigging and wheel base permit. Let us send you a car set on a ninety-day consignment for test purposes.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

Brill Mechanical Slack Adjuster

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a-834-LC

Fageol Six-Wheeler and Universal Crane Both Waukesha Powered

Two Timing for L. A.

Gasoline engines have multiplied man power and saved progressive cities thousands of dollars. The County of Los Angeles not only have Waukesha equipped trucks, but also operate Waukesha powered mobile cranes. The fuel economy and power obtained from the genuine Ricardo Head plus more than twenty years' experience building only heavy-duty engines is reason enough for Waukesha popularity.

Whether needed for automotive or industrial service you will find some model of four or six-cylinder engine just suited for those jobs where only a heavy-duty engine will stand up. With the genuine Ricardo Head Waukesha engines, the "Ell" head design is brought to such perfection that it can equal the best valve in the head performance. Write for booklet "558" describing the "Ricardo Head" principle.

A-848-LC

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Waukesha — **Wisconsin**

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Exclusive Builders of Heavy Duty Automotive Type Engines for Over Twenty Years

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. AUGUST 4, 1928 Twenty Cents Per Copy

CORNELL UNIVERSITY LIBRARY ITHACA N.Y. AUG 6 1928

THE difference in favor of Spoksteel wheels for buses and trucks, is the difference in favor of high-carbon forged steel, perfect mounting, coolness, quiet, cleanliness, and fine appearance. Wheels, tires and brakes last longer, with least attention. You can *see* why. Convince yourself with a test set. Motor Wheel Corporation, Lansing

World's Largest Wheel Manufacturers

Spoksteel

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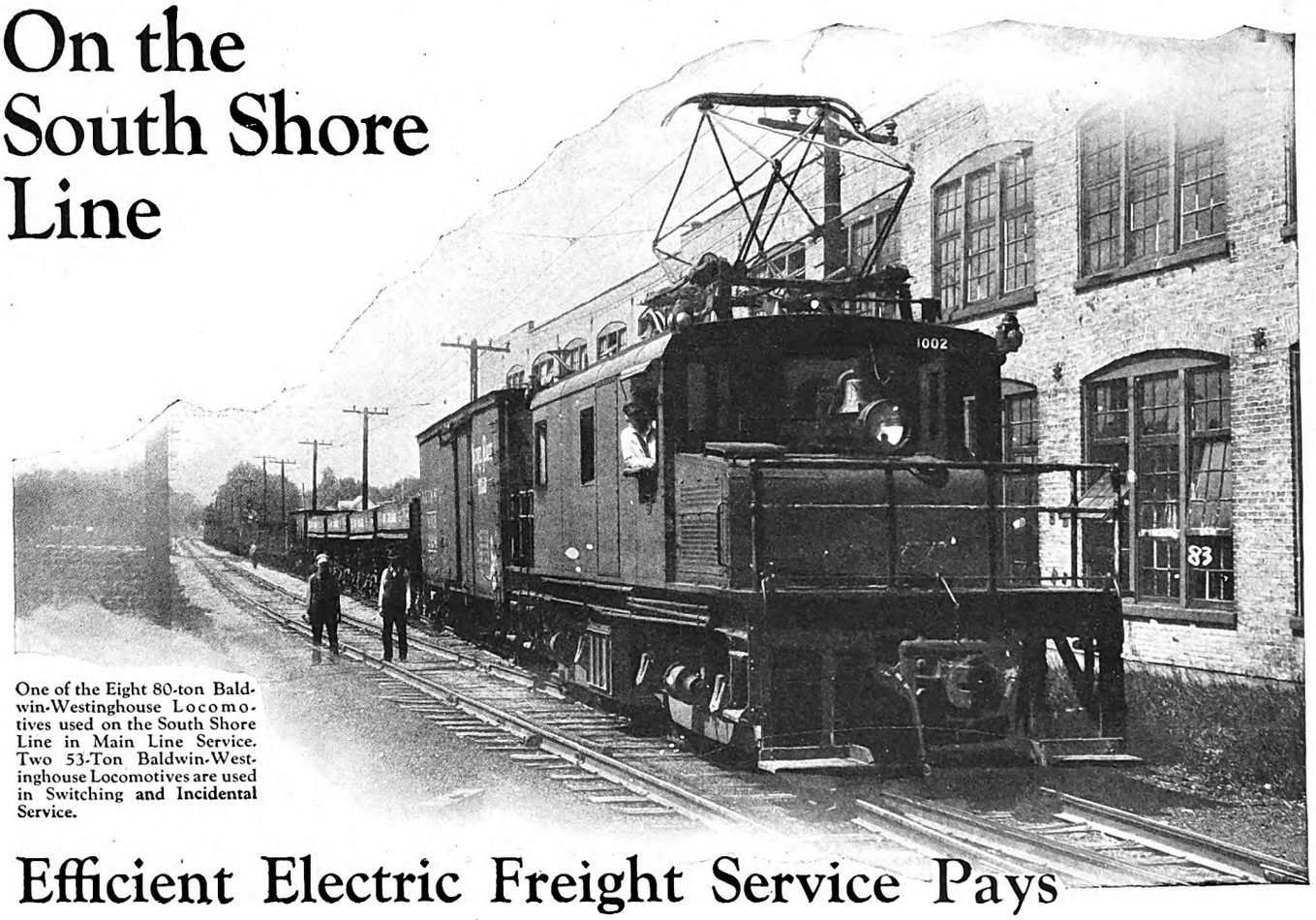
On the South Shore Line



One of the Eight 80-ton Baldwin-Westinghouse Locomotives used on the South Shore Line in Main Line Service. Two 53-Ton Baldwin-Westinghouse Locomotives are used in Switching and Incidental Service.

Efficient Electric Freight Service Pays

ONE of the noteworthy accomplishments of the Chicago, South Shore & South Bend Railroad under its new owner, the Midland Utilities Company, is the development of a rapid and reliable freight business that has proved popular as well as profitable.

An increase of from two to ten Baldwin-Westinghouse electric locomotives within the last three years is a direct measure of the remarkable growth of this business and bespeaks the agressiveness of the Railroad's corps of traffic experts that is co-operating with shippers in the territory served.

The consistency with which Baldwin-Westinghouse locomotives have been specified by the South Shore Line, when additional motive power has been required to handle the increased business, attests to the reliability of this equipment for providing a paying freight haulage service on electric railways.

The results being attained by the South Shore Line are another example of the potential revenue available from a dependable freight haulage service provided by Baldwin-Westinghouse electric locomotives as the business insurance.

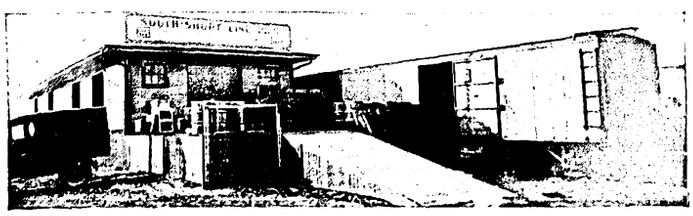
Write for a copy of Special Publication 1729.

Address either company

The Baldwin Locomotive Works
Philadelphia, Pa.

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA 1928



The South Shore Freight Station at Gary, Indiana

Baldwin-Westinghouse

T 30024

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of Street Railway Journal and Electric Railway Review
CHARLES GORDON, *Editor*

LOUIS F. STOLL, *General Manager*

Volume 72 New York, Saturday, August 4, 1928 *Number 5*

The Future Is What We Make It

"WHAT does the future hold for the interurban and city lines in the Middle West?" asked Charles W. Chase, president Gary Railways, Gary, Ind., in his paper presented before the recent Cedar Point meeting of the Central Electric Railway Association. The author answers this question not only for the Middle West, where he is specific, but for the industry in general, and proceeds to show that the result usually depends on the manner in which the respective managements handle the problems on their particular properties.

Mr. Chase reiterates the need for operating economies obtained through modernization of rolling stock and track, installation of automatic substations and of modern labor saving devices in shops and carhouses. He goes a step farther in suggesting a study with the view of cutting out duplication of effort and lost motion in the accounting department. He hints at the possibility of a subsidy in assisting in the construction of new routes. He launches boldly forth into a field too often overlooked in rehabilitation programs, namely, a financial house cleaning as a primary move in re-establishing credit.

That measures adopted must be thorough-going and not half-hearted Mr. Chase makes quite clear. Automatic substations and mercury arc rectifiers will help but little if rolling stock is obsolete; modernization of rolling stock will do little good if the financial structure remains top heavy; no property can pronounce its work completed if the financial structure has been balanced, but the all-important element of public relations has been neglected. Above everything, the management must believe in its own business and must be determined to win success.

Specific instances are cited where impoverished properties have been brought back onto the path of success by simple remedies repeatedly recommended to the industry but all too seldom adopted. Here a company has replaced obsolete rolling stock by modern one-man cars with a resulting saving of 26 per cent in car-mile cost. There a property, following a complete reorganization of physical, operating and financial structure, has been able to increase its passenger revenue more than 150 per cent over a period of two years. Still another organization which struck boldly out from conventional practice and reduced fares to certain special classes of riders has had its efforts crowned with success.

In dealing with the cases of properties in desperate physical and financial condition where instead of performance resort has been had to complaining against an unkind fate, too much time has been devoted in certain quarters to wishing that the heavens would bring down disaster upon the bus. Too many years have been spent in anticipating the time when the "saturation point" in automobile production would arrive. Too much dependence has been placed on the theory that economic conditions some day will force the working man to give up his automobile and come back to the street car. Speculation and theorizing never will accomplish the same results as concrete performance. What the future is to be in the way of transportation no man can say, but there is no doubt the electric railway will play an important part in it. There are before us too many examples of what forward thinking and aggressive action can accomplish in winning a place for the industry to warrant any other conclusion. Truly has Mr. Chase expressed the thought that the future of the local transportation industry is what we make it.

Fageol "Makes" the Headlines

VENTURING a prediction regarding the future of bus and rail transportation, Frank Fageol, president of the Twin Coach Corporation, speaking before the recent meeting of the Bus Division of the American Automobile Association proves himself to have a keen publicity sense even though his clairvoyant powers may be open to question. Not only does he evidence publicity genius, but he balances it skillfully with conservatism, tact and diplomacy.

Keen perception of the news value of his remarks is shown by the fact that our friends of *Automotive Industries*, and even our own contemporary, *Bus Transportation*, blazoned his name across their pages and print for their readers his address in detail. It should not be overlooked, likewise, that at this writing he has "made" the editorial page of ELECTRIC RAILWAY JOURNAL—and we will be pardoned for suggesting that that is no mean accomplishment.

In fact, Mr. Fageol has more than "made" the headlines. In *Automotive Industries* for July 21 the headlines attribute to him far more than he said or than the accompanying article bears out. One cannot avoid the inference that our automotive friends seem over-eager to relegate the street car to its doom. "Fageol Thinks Buses Will Replace Street Cars in 20 Years," announces the headline. But in the article Mr. Fageol actually says:

> I am firmly convinced that fixed urban and suburban transportation will ultimately disappear from our streets; however, I believe it will take 20 years to make any appreciable change and the aim and effort of all people truly interested in the economics of the situation should be to work in harmony and develop ways and means for gradual substitution of motor buses for rail cars to the end that the great public investment in rail systems shall be conserved and, in so far as possible, returned to the investors.

The cautious postponement of any material disappearance of rail transportation on city streets for twenty years is quite conservative. It is too bad that Mr. Fageol did not at the same time tell the transportation industry just how it shall be able to distinguish between a bus and a street car at the end of that period. Even at last year's convention in Cleveland, many who gazed at the exhibits were a little confused in determining which was the bus and which the street car section. Since then Mr. Fageol has been one of those responsible for resurrecting interest in the trackless trolley. We are likewise led to understand that he is busily engaged in producing a metamorphosis in the street car itself.

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Today we have "electric rail coaches," "trackless trolleys," "gas-electric coaches," "gas rail cars," "gas-electric rail cars," "twin coaches," "trolley buses," and just plain "buses" of both the gas and gas-electric variety. What may we expect in twenty years? Then who can distinguish between what is meant by a "street car" and what by a "bus"? Even if Mr. Fageol had made the prediction attributed to him by the automotive headlines, he would be perfectly safe, because if we all live until 1948 it would be possible to get on either side of the fence and claim that any one of the many varieties of public vehicles that may then be operated on the streets of cities was what was meant by a "bus" twenty years ago. The futility and ridiculousness of persistent revival of the car-bus replacement controversy seems quite obvious. But we maintain that Mr. Fageol proves himself both an able publicist and a skillful diplomat.

Equipment Men's Meeting a Real Symposium

FOLLOWING the presentation of ten papers on subjects which covered almost every phase of electric railway equipment maintenance, the Electric Railway Association of Equipment Men, Southern Properties, in its Cincinnati meeting, devoted a full day to the discussion of maintenance methods and problems.

Instead of orating on theories and generalities, the delegates lost no time in getting down to brass tacks with a list of some 51 questions pertaining to electric railway service and operation. The quiz to which these mechanical men subjected themselves greatly resembled an examination such as might be held in a university graduating class, except that there were about six times as many questions and each question was of an extremely practical nature.

While the majority of the questions related to mechanical details of electric railway upkeep, yet many of them were of general interest, inasmuch as they concerned what was being done toward providing more comfortable street cars, better looking cars, faster cars, and more frequent service. Of special interest was the way in which opportunity was given the manufacturers' representatives to answer directly questions involving the performance characteristics of their equipment. As a matter of suggestion, it would appear that no little emphasis might well be placed on such fact finding discussion as these men could contribute to in earnest.

An exchange of experiences on the maintenance and operation of the various types of street car equipment proved both instructive and extremely helpful to the different properties. The way in which differences of opinion received scant consideration unless promptly substantiated by a recitation of figures and facts was evidence of the sincerity of purpose behind the discussion. It is little wonder that this association has acquired an outstanding reputation for attention to business.

Why the Enthusiasm?

SAFETY gatherings, as a general rule, are not the liveliest kind of meeting that can be held. Most of them are "dry" affairs, with speeches on "don't do this," "don't do that," "always be careful," etc. The audiences rarely applaud the speakers voluntarily and many of the meetings prove beneficial to the weary-worn, those in need of sleep. In short, they are woefully lacking in the necessary elements to make them interesting.

An analysis of a safety rally, held recently for the employees of a large property and their families, reveals the "why and wherefor" of the deep interest and genuine enthusiasm which characterized the whole rally. In the first place the meeting had been well advertised. Knowing the date, the employees planned days ahead to attend and informed members of their families and friends, so that on the big night the huge auditorium in which it was held was filled almost to capacity.

In the second place, the entertainment committee outlined a program well worth advertising. "Home talent" vaudeville acts were supplemented by a complete musical comedy of exceptionally high order, staged by a professional group of juvenile singers and dancers. Thirdly, a human touch was added to the program by presenting to the audience the committee members who planned the rally.

The discussion of safety occupied such a small proportion of the evening that one might ask, "Why call it a safety rally?" In the brevity of the reference to safety lies the secret of the effectiveness of the whole plan. Two very brief safety talks were made, one by the company's general manager, the other by his assistant. Each speaker presented with a comparatively few words a definite message that everyone present listened to and heeded. The fact that two officials delivered the talks and otherwise took an active part in the meeting added much to the effectiveness. Other officials might have stopped at authorizing the meeting, but these two officials not only attended but also imparted much of their enthusiasm to the committee members and all who attended the rally.

Indiana Interurban Should Benefit by New Affiliation

AUGUST is expected to see the final steps taken in connection with the merger which will mean a new alignment for the properties of the Terre Haute, Indianapolis & Eastern Traction Company. The plan is an auspicious one, since it will undoubtedly mean the opportunity for the intensive development of the company along lines not possible under past sponsorship. This is in no way a reflection on the property as it has been conducted. Certainly the interurban has been hard hit, and only by the adoption of heroic measures has the local system in Terre Haute, in the heart of the soft coal fields, been able to keep its head above water.

The agreement now ready to close has been pending a long while. In advancing it to the present stage there has been a great deal of give and take. Guarantees at first thought to be imperative have been waived on the part of the owners in the interest of the probable future good to be derived from the proposed association of the Terre Haute, Indianapolis & Eastern Company with the Central Indiana Electric Company as the Indiana Electric Corporation. Some of the present holders will go in on a basis that promises little or no immediate return to them, but one that does hold out promise for the future much less remote than the continuation of operation as conducted independently at present.

The terms of the exchange of securities have been given in the JOURNAL in detail sufficiently complete to let anyone judge for himself who is interested enough to delve into the intimate facts. It would seem that in the merger the appellation designating that some of the properties are railways will go. But there again the concession appears to be in the interest of the greatest number. No one, least of all the owners, will find fault

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if the new association fits the road to meet more effectively the intensive competition of the private automobile, the bus and the motor truck and in so doing restores to it the degree of prestige it ought rightfully to enjoy.

The Quality of Courtesy is Not Strained

NO LESS a setting than the famous phrase from Shakespeare seems appropriate for expressing the quality of courtesy in human relations—and in transportation salesmanship, which is after all primarily a problem of human relations—after hearing R. N. Graham's address before the Central Electric Railway Association or reading his views in the article published elsewhere in this issue. According to Mr. Graham the quality of courtesy must be ever present in a platform man, regardless of any other qualifications which he may have as an efficient operator and representative of the company. "When we think of a conductor that has our full approval as an employee, we think of him as being neat and courteous, friendly and courteous, business-like and courteous," says Mr. Graham.

But the idea is developed further. In considering the importance of courtesy in platform employee salesmanship, two other intensely practical factors must be considered. It is all well enough to discuss abstractly the importance of courtesy in the contacts between platform employee and rider. But the practical problem is that of determining just how the men on a given property are to acquire this much-to-be-desired quality. This Mr. Graham does not neglect to do. He points out how to introduce courtesy on a property and how to disseminate it to the men in the ranks.

First of all, the management itself must have acquired the quality which it demands in the men on the platforms. To go on taking liberties with Shakespeare, courtesy, like mercy, "droppeth as the gentle dew from heaven." But the wrong point of view at the manager's desk will effectively blanket an entire organization from the absorption of this God-given quality in human relations. Courtesy cannot be hired or preached. It must be practiced. It originates at the top of an organization and not in the ranks. It travels down, not up. Obviously, also, to travel at all through an organization, there must be the kind of contact between management and employees, that will give the men the opportunity of catching the spirit of their leader.

Attacking the Parking Problem a New Way

OPERATION of automobile parking areas by electric railway companies is not a new idea, but the latest development of this kind at Philadelphia is rather different from what has been done heretofore. About two years ago several large parking fields were established in the outskirts of the city by the Philadelphia Rapid Transit Company. Payment of the parking fee entitled the automobilist to free transportation to the downtown district on the company's cars. This plan accomplished two purposes. It kept these private vehicles away from the congested downtown streets and encouraged the use of public transportation vehicles.

Recently, however, a new parking area has been established by the P.R.T. in the very heart of the city, as told in an article appearing elsewhere in this issue. At first thought this procedure might seem to encourage the use of private automobiles in the congested district to the detriment of the public transportation system. More careful consideration, however, discloses another side of the picture. The company recognizes that the private automobile has a legitimate place in the general transportation scheme, and that for one reason or another, a certain number of people must and will continue to use their own automobiles in the downtown section of the city. It is highly desirable, however, that these automobiles should be kept off the congested streets except when they are in actual use. Roadway space in the center of the city is no more than adequate for moving traffic, and its use for storage purposes inevitably produces congestion. The railway management has insistently urged that no parking be allowed on the narrow downtown streets. Obviously, then, some other parking place must be provided for the people who insist on using private automobiles. By providing convenient parking space at reasonable rates, the company feels it is encouraging the automobilists to store their vehicles off the streets, while the only profit which it expects to derive is from the relief afforded from traffic congestion.

The plan is admittedly an experiment. Some time will be required before the measure of its success can be determined. All transportation men, however, will watch its progress with considerable interest.

Getting Down to Fundamentals

SIGNIFICANT of the new thought that is taking hold of the electric railway industry is the change in character of the topics selected for the annual conventions of the American Electric Railway Association. While in the past the delegates often have been addressed in general terms by speakers who knew little about the problems of transportation, the programs now are replete with talks in concrete terms by leaders who know their subjects and are not afraid to speak straight from the shoulder.

This year the general subject treats of fundamentals that are of outstanding importance. Improvements in the electric railway's product—transportation—have been so numerous that there is much to be said that is of interest to all operators. In the sessions of the American Association, in the sessions of the affiliated associations and at the luncheons this theme will be expanded. In the exhibits will be concrete evidence of improvements that will drive home the lesson so that it cannot be missed.

In every department there has been definite progress, both physical and mental. The leaders are thinking in terms unheard of a few years ago. Methods have been developed, and mechanisms have been perfected, for doing what was thought to be the impossible. Cars have undergone a complete metamorphosis, and it is expected that new types will be on exhibit that will out-distance anything previously developed. The bus, the newest entry into the transportation field, has itself undergone a development so complete and so rapid that it is difficult to keep pace with it. Track and line have likewise undergone improvements that have changed the entire outlook of the engineers. Transportation department methods have changed no less radically. Safety has been obtained without sacrifice of speed or other desirable characteristics. Accounting methods, too, are undergoing great improvement. In short, there is no one connected with a transportation property who has not been under the influence of these developments.

Out of this background comes the convention. As few conventions have in the past, it puts in concrete form the new thinking that has been going on. A program such as that in preparation has something for everyone, and everyone can add something to the program.

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Transportation Improvements

Recommended for Milwaukee

McClellan & Junkersfeld, Inc., emphasized need for early action by the city to reduce street congestion. Basis of mass transportation declared to be street railway and rapid transit, supplemented by bus

FIRST ARTICLE

IN THIS, the first of two articles abstracting the Milwaukee Transportation Survey, are the recommendations made for the improvement of transportation and the measures advocated for the relief of congestion. The second article, to be published next week, will contain an outline of transportation conditions found in Milwaukee, including an analysis of travel routes and other factors affecting the performance of street railway and bus lines.—EDITOR.

COMPREHENSIVE plans for the immediate relief of congestion and for the improvement and expansion of transportation and highway facilities to keep pace with the future, as well as the present needs of the city, are contained in the transportation survey of the Milwaukee metropolitan district recently completed by McClellan & Junkersfeld, Inc., for the transportation survey committee of Milwaukee, an appointive body composed of four groups representing the city administration, the public, the Railroad Commission of Wisconsin and the Milwaukee Electric Railway & Light Company. The work was directed by Thomas R. Tate, who also had charge of the Washington survey made by the same firm, a digest of which was published in the Oct. 31, Nov. 7 and Nov. 14, 1925, issues of ELECTRIC RAILWAY JOURNAL.

Major highway plan proposed for Milwaukee by McClellan & Junkersfeld, Inc., to speed up movement of traffic and reduce congestion

Milwaukee, like most other cities of the country, has for some time been suffering from congestion of its streets and highways, with resultant slowing down of all forms of transportation, and consequent economic loss to the community and restriction of its development. The increase in congestion that has taken place to some extent on all main traffic arteries during the past few years, and principally those in the central business district, made it apparent that a comprehensive survey was necessary to determine the pertinent facts upon which to base plans for relief. The most important effect of congestion increase was the lower average speed of travel. This is illustrated by street car speeds, data on which were available over a

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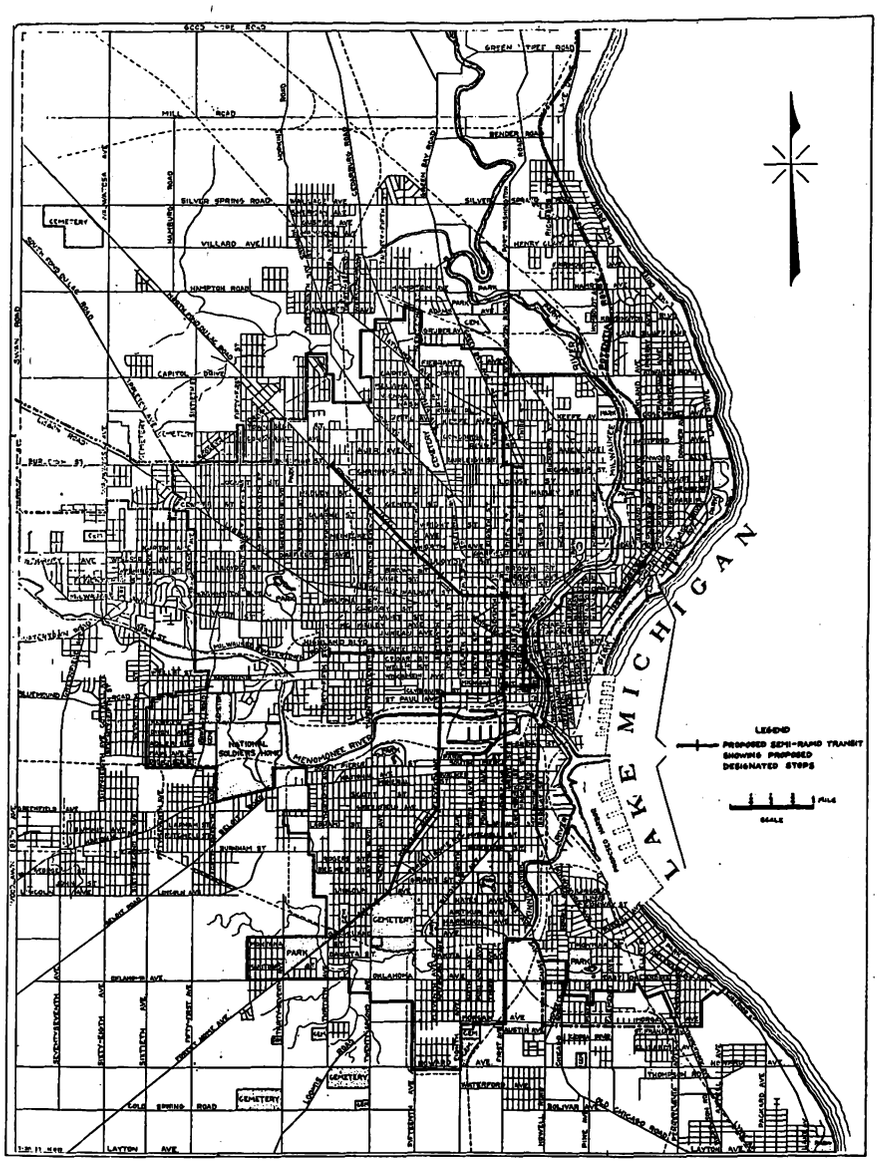


Faster service for street car riders is provided by a system of semi-rapid transit surface lines with limited stops

period of years. Comparable speed reduction for other classes of traffic had taken place even with increasing expenditures for traffic regulation. Street car speeds for several years beginning in 1922 were as follows:

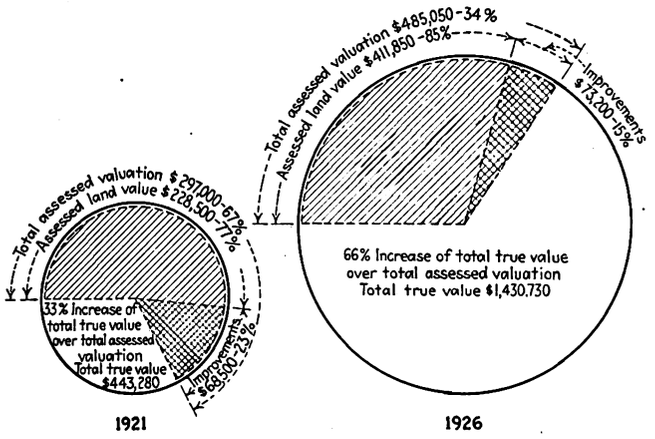
Year	Miles Per Hour
1922	9.83
1923	9.69
1924	9.68
1925	9.62
1926	9.48

The survey outlines plans looking forward to the needs of a population of 1,000,000 people by 1950. It recommends a gradual program of improvement intended to provide for the rapid and efficient movement of public and private transportation vehicles with minimum expenditures for street widening and other major construction projects. The principal recommendations include the following: A system of major traffic routes, arterial highways and trucking routes, requiring the widening of certain streets and the construction of new bridges and viaducts; parking restrictions varying with the traffic on the several streets and districts; regulation of river bridge opening hours to avoid interruptions of rush-hour traffic; improvements in the control of traffic signals and elimination of street jogs, bottle-necks, dead-ends, and other physical causes of congestion; further development of the rapid transit system, a part of which already has been built, to serve the growing needs of suburban areas; a semi-rapid transit plan to permit faster movement of street cars pending the construction of additional high-speed lines; rerouting of street car and bus lines, new lines and extensions, loading zones, queue loading, prepayment of fares, improvements in methods of fare collection, modification of the Wisconsin Railroad Commission's service standards, and staggered working hours to reduce peak loads.

Principles of Relief Established

Certain general principles of routing and control are set up as the basis for the development of a traffic plan suited to meet the condition of rapidly growing traffic volume. These are, briefly: Segregation of slow-moving, fast-moving, local and through traffic, trucking, mass transportation facilities, etc.; effective utilization of those key streets, especially certain radial and diagonal highways, which by their location and topography, their connections and districts served, form natural traffic arteries; reduction of vehicle density in congested streets by providing alternate routes in certain areas; increasing the effective area of existing streets; increasing the effective use of existing streets.

In the major highway plan shown on the accompanying map arterial highways are intended for high-speed traffic only. It is proposed to prohibit all but light and high-speed trucks from using these highways after a system of trucking routes is fully developed. Streets having car lines were not designated as arterials



The effect of improved transit facilities on land values is illustrated by the increase in value from 1921 to 1926 of property adjoining the new Wauwatosa rapid transit line which was built by the Milwaukee Electric Railway & Light Company entirely with its own funds

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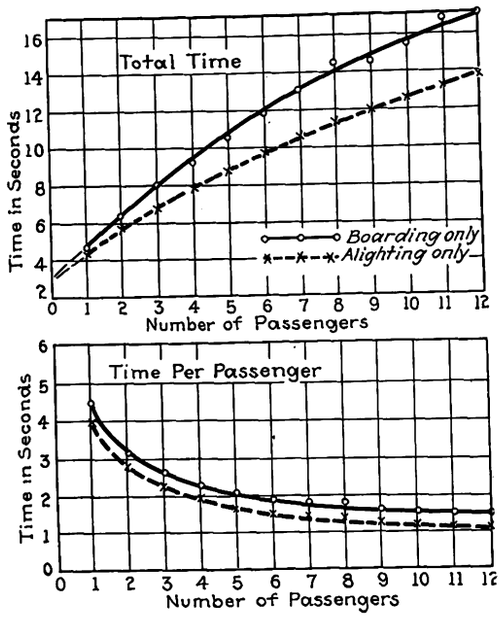
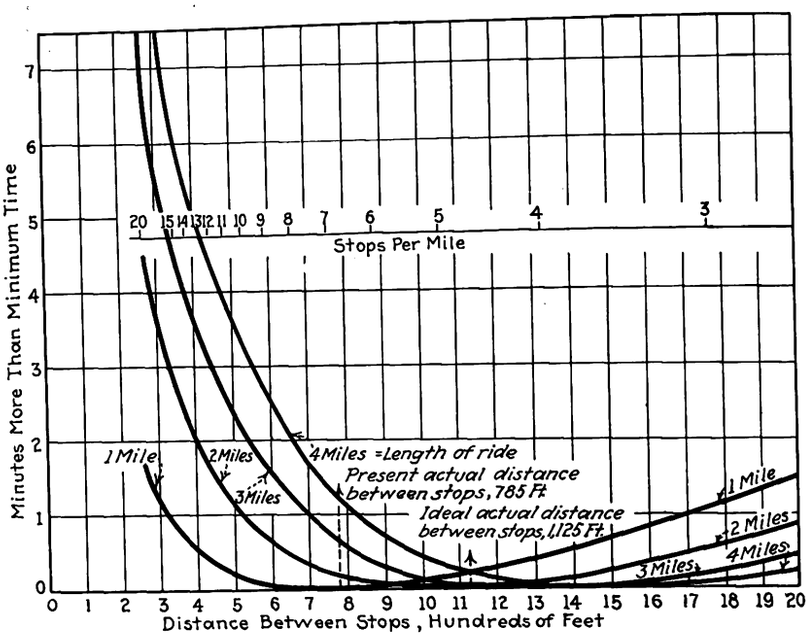


Time of stop per passenger boarding or alighting decreases with increase in the number of passengers interchanged



The effect of the distance between stops on the time required to travel various distances shows in a striking way the advantage to the passenger of decreasing the number of scheduled stops

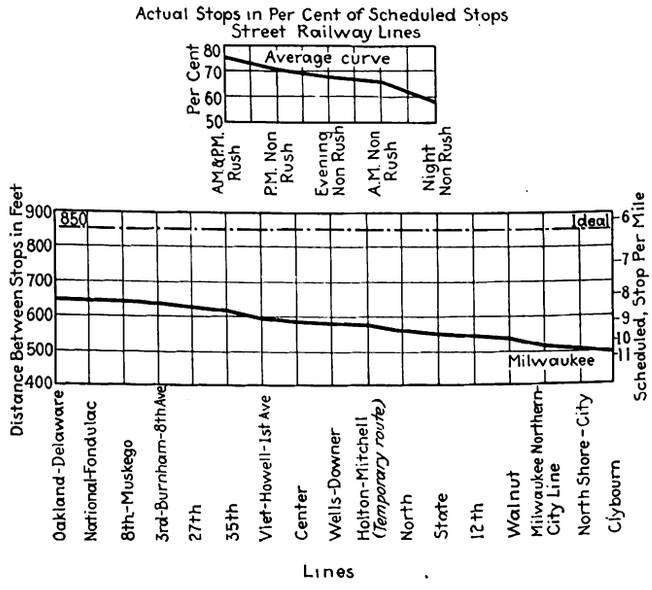
unless they were main diagonal routes or important cross-town arteries. The number of arterial highways was kept at a minimum in order to avoid unnecessary delays to crossing traffic. A thoroughly co-ordinated, progressive traffic control system is recommended for the arterial highways. Trucking routes are laid out to keep slow trucks off the arterial highways and street car streets, but are intended to provide a comprehensive system of direct routes to serve industrial plants, railroad and dock terminals, commission houses and warehouses. The street-widening suggestions contemplate completion within five to ten years of those improvements now urgently required or considered necessary within that time. The program includes only those street-widening projects considered essential and proposes for the most part the widening of roadways by setting back the curbs. Construction of certain new bridges and viaducts also is recommended.

Parking restrictions were drawn to reduce congestion on main arteries and in heavily traveled districts, especially during rush hours, while at the same time giving consideration to the needs for loading and unloading passengers and goods as indicated by traffic and parking checks, both in the central business district and in outlying sections. Specifically, it is recommended that parking be prohibited from 7 a.m. to 11 p.m. in the central business district on Wisconsin Avenue, the principal business street, and on certain other streets in the central business district during the rush hours only, from 7 a.m. to 9 p.m. and from 4 p.m. to 6 p.m. Parking prohibition all day is recommended on certain other principal arteries outside of the business district and on still others during the rush hours, from 7 a.m. to 8:30 a.m. and from 4:30 p.m. to 6 p.m.

Causes of Traffic Delay Cited

Milwaukee has a city ordinance, passed many years ago, which prohibits the opening of any of the movable river bridges between 6:15 and 7 a.m. Proper bridge closing hours were determined from traffic checks made on the principal bridges. The report recommends that all bridges be closed for 1½ hours during both the morning and evening rush, the period for the evening being 4:30 to 6 p.m. for all bridges, but the morning period varying for different locations. Because of the street layout and the presence of double-track car lines on most of the streets in the central business district, one-way streets are not recommended. The shifting of traffic lanes morning and evening on two important thoroughfares leading to the central business district is suggested.

A system of progressively controlled traffic lights is recommended for Wisconsin Avenue through the most congested part of the downtown district. Many of the intersections now controlled by traffic lights were found not to have sufficient crossing traffic to justify them. Prohibition of left turns is recommended only at inter-



Scheduled stops per mile and distance between stops are shown for all city lines. This chart also shows the relation between actual stops and scheduled stops for various periods of the day

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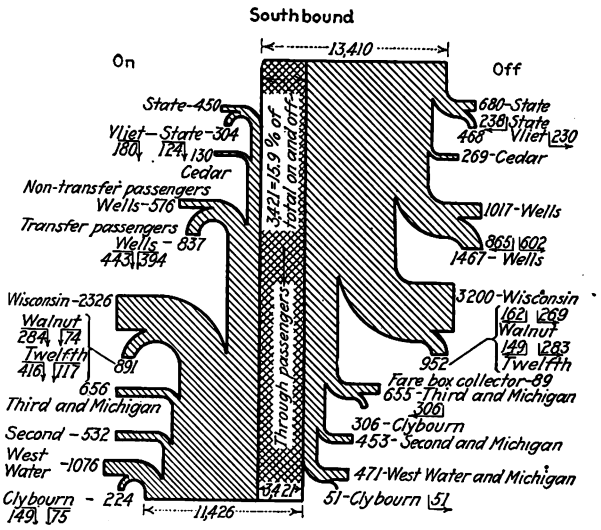
sections where the number of such turns during the rush hour causes congestion.

The Milwaukee Electric Railway & Light Company has launched an extensive program of rapid transit construction and has practically completed two projects. This program, which was discussed at length in an article published in the Feb. 25, 1928, and March 3, 1928, isues of this paper, contemplates serving outlying areas by rapid transit lines operating on private right-of-way, using in some instances the right-of-way of the company's interurban electric railways. It is proposed to bring the rapid transit lines into the basement of the Public Service Building through subways in the most congested portion of the city. The report points out that the Chicago, North Shore & Milwaukee Electric Railroad affords a route for a rapid transit trunk line and that the Chicago-Milwaukee service of this railroad could be brought into the city through subways built for rapid transit purposes. Attention is drawn to the possibility of rapid transit service for the residential areas adjacent to the lake front on the north of Milwaukee by using a Chicago & Northwestern Railway route which is now being abandoned.



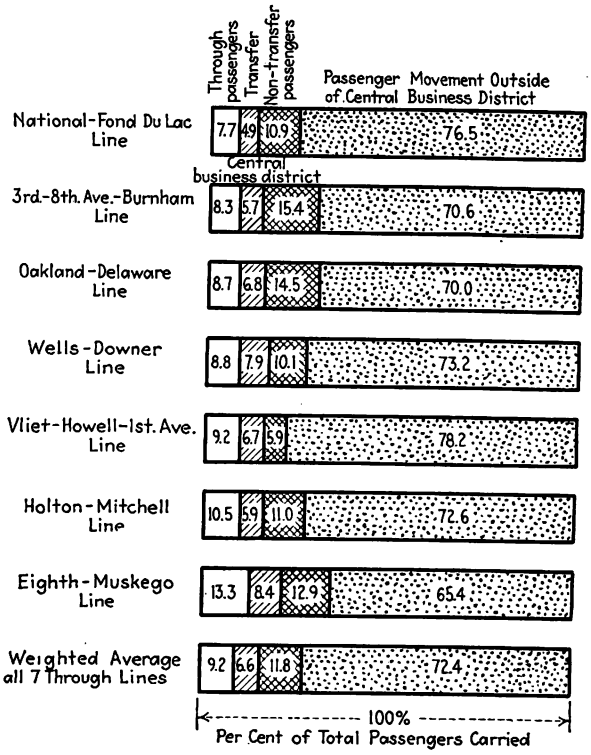
Another method of showing the relation between transfer and through passengers in the downtown section is illustrated by this chart for southbound movement on the Third Avenue-Burnham line on a typical week day

Semi-Rapid Transit Surface Lines Proposed

To provide faster service within the present city limits it is proposed to inaugurate a system of semi-rapid transit lines on the surface with limited stops. Six routes are proposed and are shown on the accompanying map. It is recommended that these streets be designated as "Transit Highways" and that all crossing traffic be required to come to a full stop. Passenger stops would be made about one-half mile apart at transfer points and other important intersections, with more frequent stops in the central business district. At the terminals of these lines it is proposed to erect suitable shelters for transferring under cover. This semi-rapid transit scheme makes possible the rerouting of several local street car and bus lines. It is proposed to use three-truck, articulated, two-car trains on the semi-rapid transit lines, and single-unit and one-man cars in outlying districts. Several through-routed street car lines would be looped in the central business district, most of them in the Public Service Building. In outlying districts most of the extensions consist of feeder bus lines connecting with the semi-rapid transit lines. East-and-west crosstown bus lines are proposed on Capitol Drive and Burleigh Street.

Among the suggestions made for improving the street railway service are: installation of safety zones throughout the central business district and at principal outlying transfer points; raised platforms with suitable protection for passengers; prepayment zones at heavy traffic interchange points; street fare collectors at heavy loading points during rush hours; "queue" loading at certain industrial plants and other heavy loading points; changes in equipment to reduce the time of opening and closing car doors; use of metal tokens in place of paper tickets to speed up loading, with the possibility of using automatic registering fare boxes; revision of transfer practices; new equipment.

It was found that the loading standards and specifications which the Railroad Commission of Wisconsin has developed fo rthe city of Milwaukee are more rigid than those adopted in most cities where legislation of this sort has been attempted an dthat in its effort to live up to the letter of these requirements the company has, at times, especially during the summer months when traffic is slack, been supplying considerably more service than conditions warranted. With this in view it was recommended that the company, co-operating with the Railroad Commission, be permitted more flexibility in the preparation and revision of its schedules so that sudden or seasonable changes in traffic could be anticipated and provided for as they arise. It was also pointed out that more economical and improved service would result if the sharp rush-hour peaks could be reduced by staggering working hours of large industries. This is a practice that has been successfully followed in other cities.



Extent of the transfer movement of passengers in the business district in relation to the non-transfer and through passengers and to the total passengers carried varies considerably between the several lines shown

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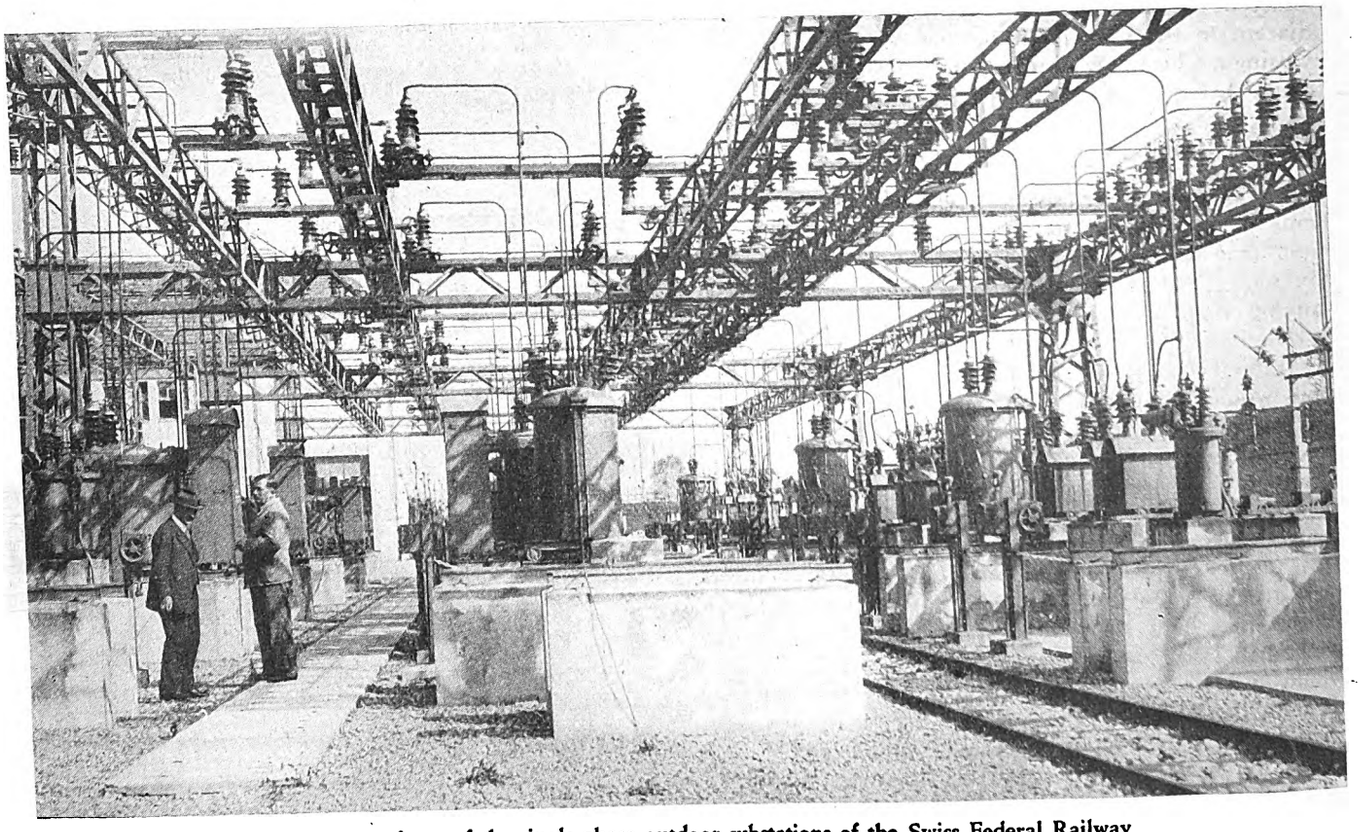
Water Power a Factor

in the Electrification of Swiss Railways

Purchase of foreign coal was obviated by electric operation of Swiss government railway system. Light forms of contact line construction used. Maintenance costs of locomotives are given

By Kent T. Healy
Research Associate, Yale University, New Haven, Conn.



Arrangement of one of the single-phase outdoor substations of the Swiss Federal Railway

FOLLOWING the war the Swiss Federal Railway system was at the mercy of foreign coal miners and companies, with the result that traffic was severely impeded and fuel expense mounted to unheard-of heights. With the supply of water power so plentiful in Switzerland the answer to the coal problem was electrification. Electrification began in 1919 and plans were made for conversion of all the main lines by 1933. In 1921 the program was accelerated to help the unemployment and slack industrial condition and 1928 was set as the year in which the construction was to be completed.

The electric power for the system comes in the main from the two water power groups, Ritom-Amsteg and Barbarine-Vernayaz. The first group is paired, the Amsteg plant on the north side of the mountains utilizing the melting snow and glacier ice in the summer, while the Ritom plant on the south side supplies the power in the winter. The other group consists of a river plant at Vernayaz and a storage plant at Barbarine, the latter two using the same water. The main plants of each group have some generators supplying commercial transmission lines. The energy production of this system in 1926 was as follows:

	Kw.-Hr.
Energy produced in railroad plants	285,000,000
Purchased energy	19,500,000
	304,500,000
Transferred to outside companies	59,200,000
Energy consumed in power plants	2,000,000
Energy for other non-traction uses	4,600,000
Transmission losses (estimated)	22,000,000
Substation consumption	1,700,000
Substation output	213,000,000

The maximum momentary power swings during this period were 4,200 kw. at the Massaboden plant, 48,500

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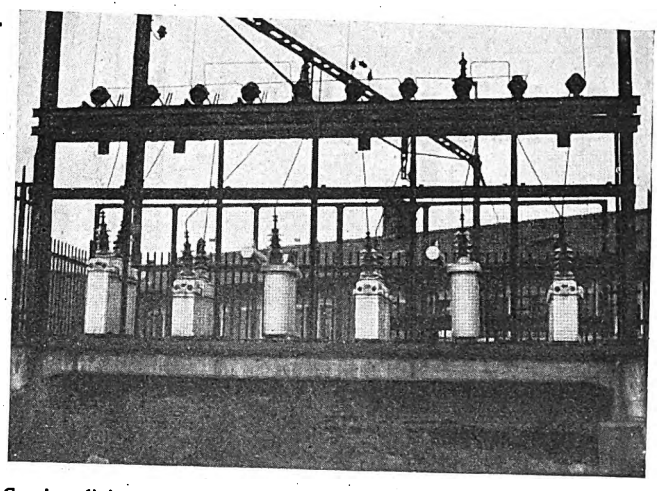
kw. for the Ritom-Amsteg plants and 19,500 for the Barbarine plant. The load factor on the basis of momentary swings for the Ritom-Amsteg group, the only one under full operation, was 41 per cent. The cost of energy per kilowatt-hour delivered from the substations was about 1.2 cents based on 5 per cent interest on the capital, 0.5 per cent for a sinking fund on all property, 1 per cent for a retirement fund on transmission lines, etc., and 3 per cent for a retirement fund for machinery. As the load increases and the full capacity of the plants is utilized the costs will naturally be less. The budget for 1928 contemplates a cost of 1.1 cent.

Energy Is Transmitted Over a 66,000-132,000-Volt System

The energy from the power plants is transmitted over a network of 66-kv. and 132-kv. trunk lines to various substations feeding the overhead distribution systems. The map shows the general arrangement of the whole system. The transmission lines are of the ordinary type in most places, although 175 miles of cable line on the 66-kv. circuits are in use in restricted sections such as narrow valleys, tunnels, and places where there is danger from landslides. The cost of construction of the usual two-circuit single-phase transmission line with steel poles ranges from $10,000 to $12,000 per mile.

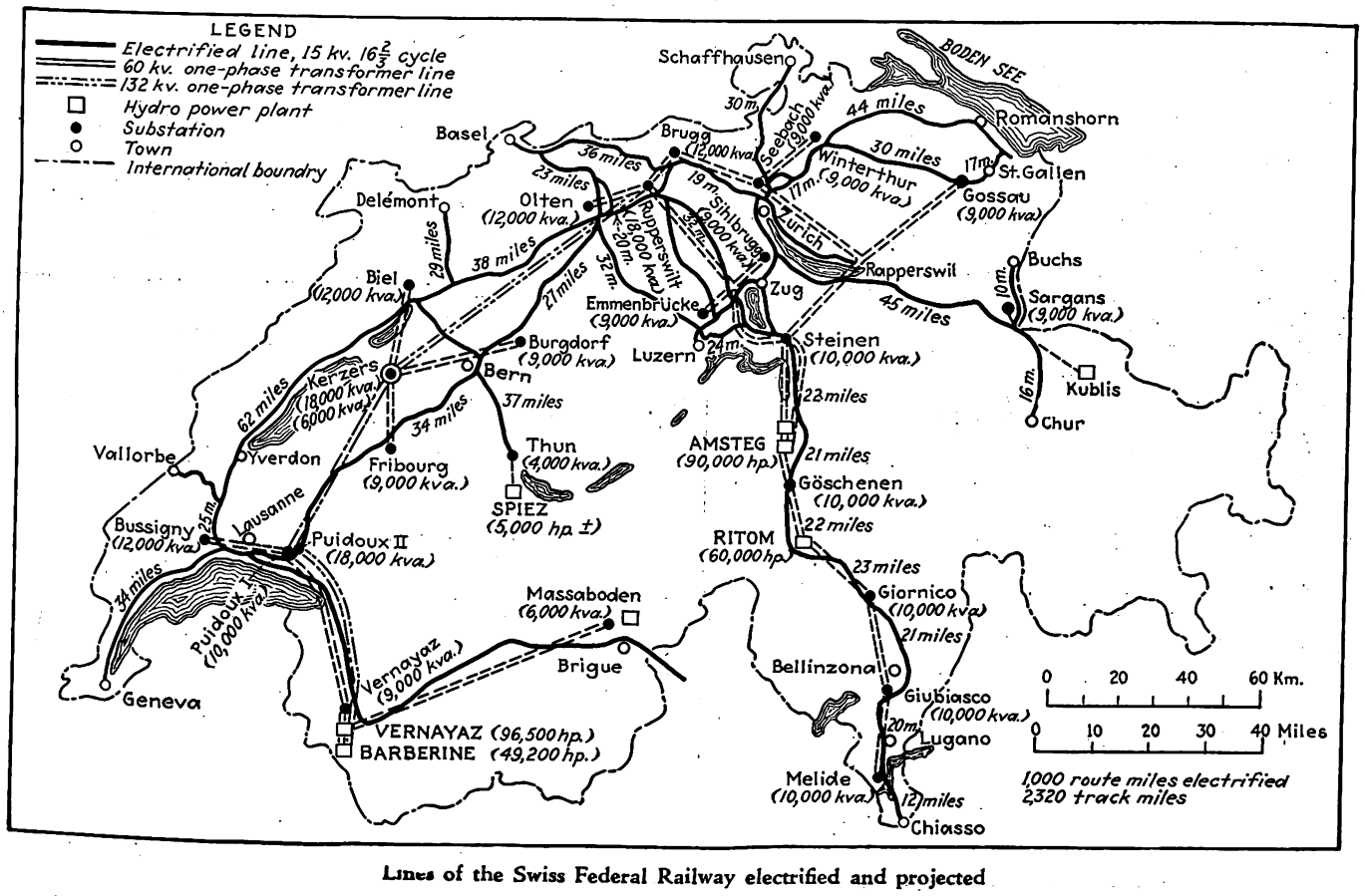
The substations are merely static transforming points with provisions for sectionalizing and switching on the transmission lines. They also form the control points for each group of overhead trolley distribution lines, the substation operators acting as load dispatchers or power directors for their respective groups. In the modern substations all power equipment is outdoors, with control apparatus, local service, and repair facilities for the largest piece of apparatus housed in an adjoining building. All equipment is mounted on wheels and tracks



Sectionalizing switch group at one of the small stations with oil disconnecting switch and potential transformers

connecting with the repair room. Rigid buses are used throughout as a precaution against complicated tie-ups from bus failure. Standardized single-pillar insulators are used for distribution of 15-kv. circuits, and double insulators for transmission circuits with 30 kv. to ground. The arrangement is shown in one of the illustrations.

The distribution switching in the substations is coordinated with the general principles of sectionalizing on the whole track system. With a view to saving oil switch costs the rupturing of all short circuit or ground currents is confined to relatively few circuit breakers located in the substations. These are of the series opening contact type with resistance across the first three contacts to open. With a ground the main breaker in the substation instantly opens, and the line is energized again at normal voltage through a circuit with a limiting resistance to keep the current flow to 10 amp.



Lines of the Swiss Federal Railway electrified and projected

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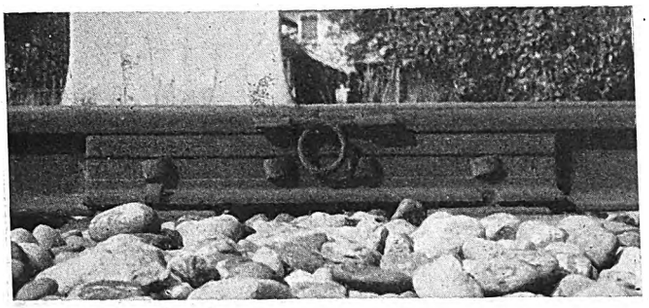
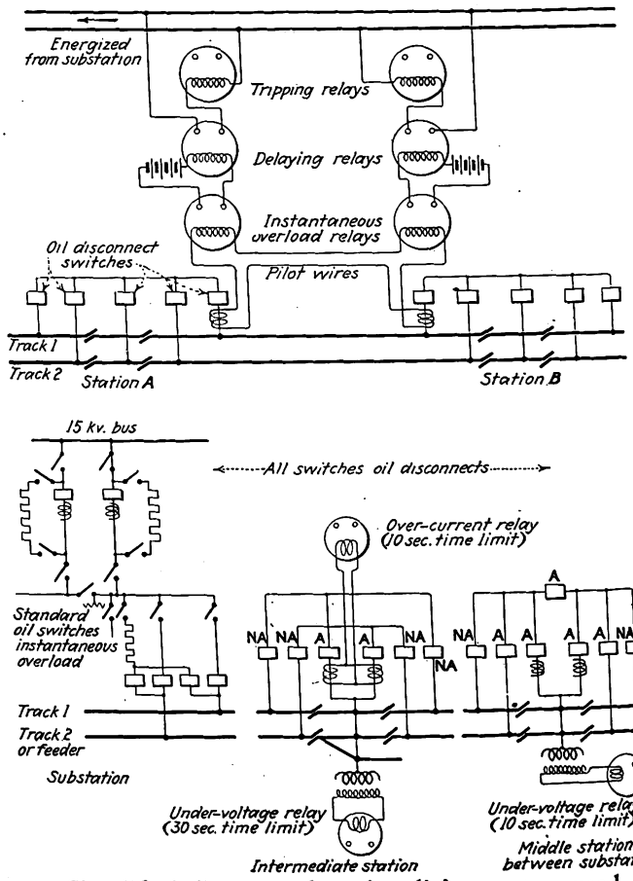


Electric welded bonds have a complete loop of the cable to give flexibility

Local sectionalization of the track circuits is effected in different ways, though all types conform to the general principle of testing with limited current following the trouble. The advantages of this are twofold. Re-energizing the line with a small current prevents burning of the wires and further damage in other ways. Sectionalizing can be done with switches designed to handle only this small current, rather than large capacity switches, thus saving many thousands of dollars in equipment.

The most highly developed sectionalizing system is that in the heavy traffic two-track line through the St. Gothard tunnel to Italy. Here the tracks are sectionalized at each station, with all the yard tracks kept separate. At each end of main line section is a current transformer in the switch bushings, the two tied together through a cable circuit running from station to station parallel to the tracks. At each end this circuit is connected with current relays, indirectly actuating the oil disconnect switches to sectionalize the particular track. The current transformers are in opposition so that when there is an excessive current flow in another section the net result in this relay circuit is zero, but where there is a ground within the section and it is fed from both ends the currents in the relay circuits are added. The disconnect switches, however, do not open till the substation circuit breaker has opened and the testing current been limited to 10 amp. This system is shown in one of the illustrations.

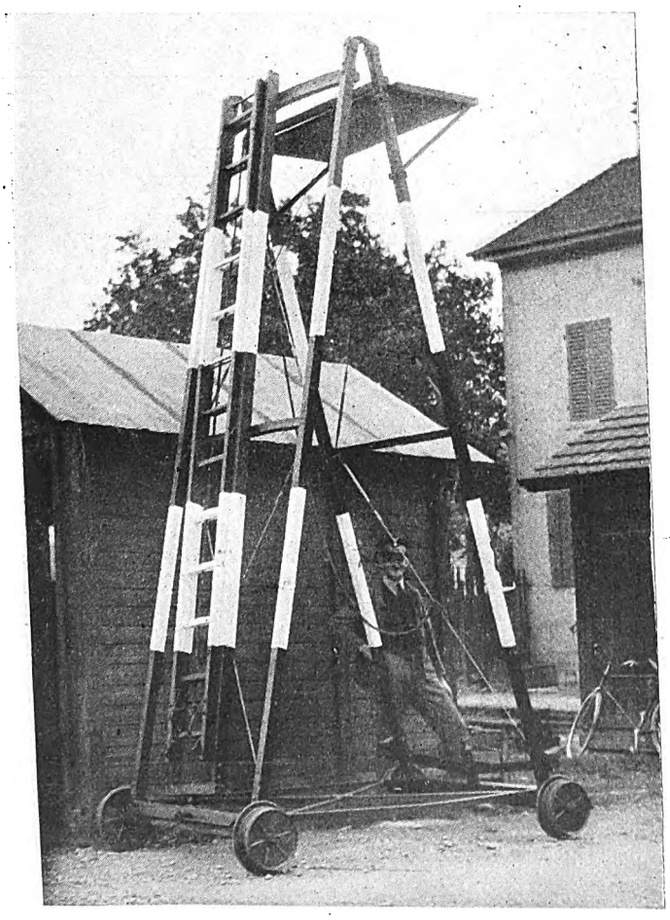
With a view to reducing the cost of sectionalizing equipment a study was made of the location of failures over a period of years. Only 15 per cent of the failures were more than temporary, and most of these occurred in yards and stations. With this record automatic switching at each station along the line seemed unnecessary. The yard and station territory was fed separately



Simplified diagram of sectionalizing system used

A—Automatic—operated by relays. NA—Non-automatic.

through an oil disconnect switch actuated by an under-voltage relay with a time limit to permit the substation breakers to open the ground current. For two-track sections, the tracks were automatically separated by similar switches actuated by time limit current relays. The sections were also separated midway between substations by automatic disconnect switches opening on a short time limit to allow as much of the line to remain alive as possible in the testing process. Accompanying views show a typical switch group and the wiring diagram for such an arrangement.



Maintenance ladder equipment

Two Designs of Overhead Distribution System

The overhead construction follows two different designs. The first type is confined to a short span of about 200 ft. with no intermediate steady devices. Light H section rolled-steel poles are preferred, but fabricated poles are dictated to foster home industries. Light

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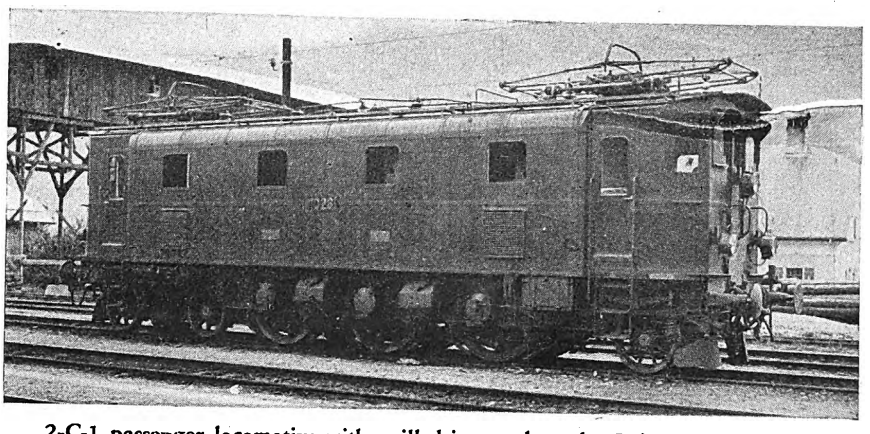
cross beams support the catenary from pin insulators. The other type uses a normal 328-ft. span with an intermediate pole for steadying or pull off purposes. These are shown in illustrations. In both designs the contact wire tensions are kept constant at 1,320 lb. for a 0000 copper wire. The tension apparatus for this are spaced at 3,000-ft. intervals. The maximum tension in the $\frac{3}{8}$-in. steel messenger is calculated at —4 deg. F. to be 1,320 lb. in both designs, giving a factor of safety of six. The contact wire is tied to the messenger every 39 ft. with copper-clad hangers somewhat over $\frac{1}{8}$ in. diameter. To give freedom for movement of the contact relative to the messenger the minimum length of hanger is 30 in. Flexible joints in the hangers prevent hard spots on the contact wire.

The design of the catenary has been simplified after extended experience with an intermediate wire, only a messenger and contact now being used. In steam operating territory a copper-clad messenger is used to prevent early corrosion. Double insulation is also used, though its discontinuance has been advised for sections in which the train operation is purely electric. The pole spacing has been governed by the wind, normally being calculated on the basis of wind pressure of 15 lb. per square inch. Where exceptional winds are encountered the pole spacing is shortened.

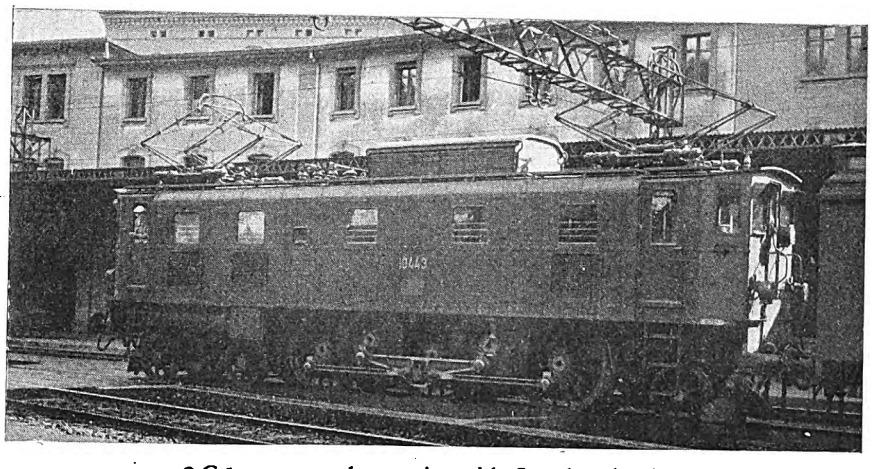
Great effort has been made to give uniformly long life to all parts of the overhead system. Non-ferrous fittings are used throughout. Aluminum pantograph shoes with pressures of 7 to 9 lb. allow copper contact wires to be used without appreciable wear even on the heaviest traffic sections.

Overhead Maintenance Done at Night

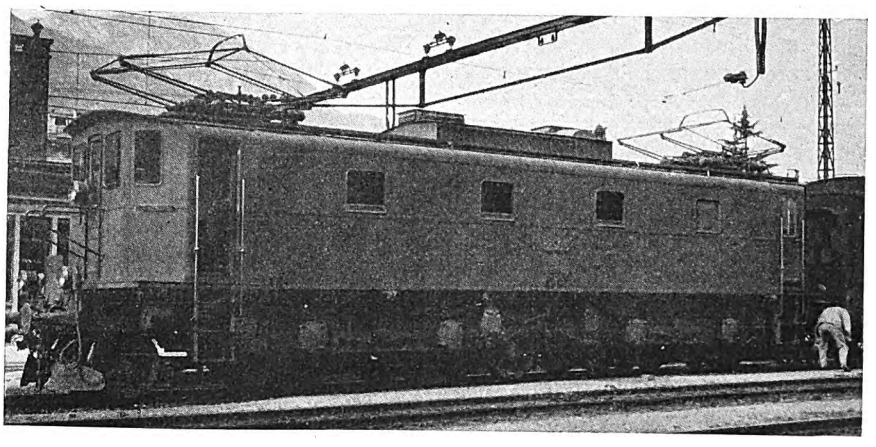
Maintenance of the overhead system is normally performed between midnight and 4 or 5 a.m., so as to utilize the labor efficiently without traffic interruptions. Small collapsible ladders are towed by gas cars to the working place. Tower cars for heavy work are hauled by steam locomotives commandeered from the nearest enginehouse. Most of the troubles, such as insulator failures, hanger breakages, messenger and trolley breaks can be handled from the light ladder cars. The repair crews have main headquarters at the substations with some equipment and men at outlying points. Each foreman covers on an average 76 miles of track with one lineman for every 13 miles of track.



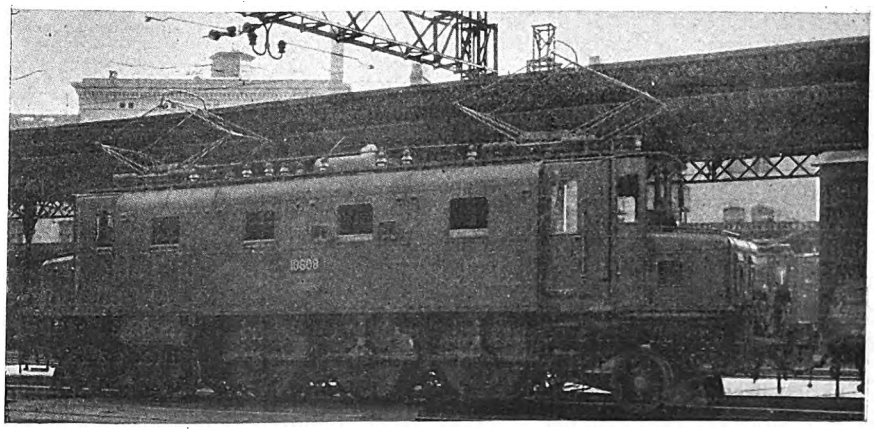
2-C-1 passenger locomotive with quill drive used on the Swiss Federal Railway



2-C-1 passenger locomotive with Scotch yoke drive



2-C-2 passenger locomotive with Buchli drive



Heavy service Gothard pass locomotive with quill drive

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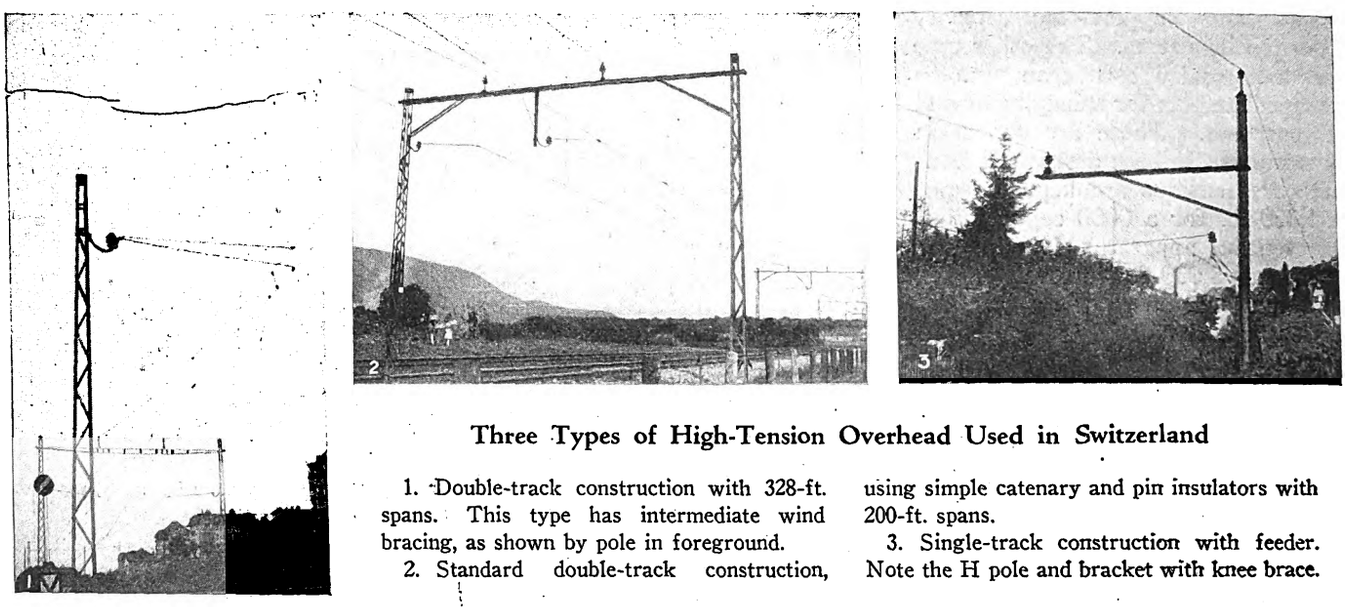

Three Types of High-Tension Overhead Used in Switzerland

1. Double-track construction with 328-ft. spans. This type has intermediate wind bracing, as shown by pole in foreground.
2. Standard double-track construction, using simple catenary and pin insulators with 200-ft. spans.
3. Single-track construction with feeder. Note the H pole and bracket with knee brace.

Telephone and telegraph interferences have been handled entirely in the communication circuits themselves. On one of the early stretches of electrification, however, an experimental three-wire distribution system such as is used on the New York, New Haven & Hartford Railroad was installed. It was deemed unnecessary to continue this practice since cabling was necessary anyhow, so that sufficient protection was possible in the communication circuits themselves. The railroad has had to pay ⅓ the cost of all the cabling of the general communication circuits involved, as well as to cable its own circuits. The total cost has been in the neighborhood of $12,000,000.

The bonding was investigated from the standpoints of interference and the efficiency of the distribution system. Sections were run with no bonds, with partial bonding and then with total bonding. The results pointed to the need of bonding, but with no great certainty. Originally iron bond wires were installed. Then bonding at the base of the rail was tried but gave some trouble with rail breakage. Bonds oxy-acetylene welded to the head were not considered successful, either. The type of bond chosen was a copper rail-head type, electrically welded and provided with a full loop to prevent vibration breakage of the bond itself.

The selection of motive power has been complicated because of the close intermixture of heavy mountain grades and the long stretches of level track in the valleys and plains. This has necessitated equipment especially for the grade sections, in addition to the normal motive power. The choice of drive for the locomotives has also prevented early standardization. In the last few years results of long service tests have become available. These include three groups of passenger locomotives in similar work equipped with the three best known types of drives that are suitable. The characteristics of these locomotives, and the results as shown in the annual reports of the railroad, are shown in Table I.

With the Buchli drive, considerable trouble arose at the start from the lubrication of the sector centers and from entrance of dirt into the ball and socket joints. This was overcome and most satisfactory operation obtained. The smooth riding qualities of this type were noticeable. Too much labor was required to keep the rod drive in good condition at passenger train speeds on level sections of track. The quill type gave trouble with spring breakage and did not work well with a rigid locomotive frame. As a result the Buchli drive was chosen as standard for passenger service in level country, with either a 1-C-2 or a 1-D-2 wheel arrangement.

TABLE I—DATA FOR SINGLE-PHASE PASSENGER LOCOMOTIVES, SWISS FEDERAL RAILWAY

Wheel arrangement	1-C-2	1-C-2	1-C-2	1-C-1
Drive	Quill	Scotch yoke, geared jackshaft	Buchli	Quill
Weight, tons	97	110	101	94
Tractive effort, lb.				
Starting	31,000	33,000	33,000	31,000
One-hour rating	17,000	18,000	18,000	17,000
Horsepower				
One-hour rating	1,800	2,000	1,890	1,800
Continuous	1,560	1,665	1,650	1,560
Number of motors	6	2	3	6
Maintenance cost per locomotive-mile, cents				
Year 1924	.....	4.2	11.1	8.4
1925	.....	11.0	8.0	5.3
1926	3.6	8.8	5.6	8.8
Number in service				
Year 1925	2	34	42	25
1926	8	57	62	26
Average yearly miles				
Year 1925	.....	33,000	32,000	53,000
1926	41,000	34,000	43,000	47,000
Cost each locomotive	$84,000	$85,000	$89,000	$81,000

TABLE II—SWISS FREIGHT LOCOMOTIVE CHARACTERISTICS

Service	Mountain passenger	Freight
Wheel arrangement	1B-B1	1C-C1
Drive	Geared side-rod jackshaft	Geared side-rod jackshaft
Weight, tons	122	141
Tractive effort, lb.		
Starting	40,000	57,000
One hour rating	23,000	37,000
Horsepower		
One-hour rating	2,040	2,240
Continuous	1,780	1,820
Number of motors	4	4
Number of locomotives	42	34

For slow-speed service, such as normal freight traffic and passenger traffic in heavy grade sections the rod drive has been retained. The standard types are shown in Table II.

On all motive power auxiliary and control apparatus has been standardized to reduce storehouse and maintenance costs. The same pantographs, oil switches, control equipment, etc., are furnished on all types, whether built by the Brown Boveri, the Oerlikon or the Secheron companies.

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The locomotive transforming equipment consists of an oil-cooled transformer provided with taps for voltage control of the motors and a section for furnishing current for heating the train. The control apparatus is simply a double-sliding brush running over alternate taps on the transformer with interlocked automatic switches to prevent short circuiting of the coils.

Considerable discussion has arisen over one-man operation of the locomotives. Naturally the management considers this an opportunity to realize a saving. Train heating is electric except on international trains, where heating cars are provided, so that a helper in the locomotive is not needed for boiler service. A foot-actuated "dead man" device takes care of failure of the motorman. The labor organizations, however, have objected strenuously to any lay-off of firemen and they are quite ready to use any necessary political pressure to obtain their ends.

TABLE III—APPROXIMATE EXPENDITURES TO THE END OF 1926 AS SHOWN IN THE ANNUAL REPORT ON COMPLETED AND UNCOMPLETED PROJECTS

	Total	Per Cent
General	$9,000,000	8
Power plants	28,700,000	25
Transmission lines	6,700,000	6
Substations	6,500,000	6
Distribution	20,600,000	18
Changing of bridges, tunnels, etc., for clearance	2,600,000	2
Changes in communication lines	11,800,000	10
Shops	1,800,000	1
Motive power	38,400,000	34
Total	$114,100,000	100

The general capital expenditures for the electrification form an interesting review of the whole project both as to its size and the relative importance of the various elements. They are shown in Table III.

At the end of 1926 about 1,600 track-miles were electrified, with a route mileage of about 650 comprising some 36 per cent of the total mileage. In round figures, during 1926 11,000,000 electric locomotive-miles were run and 3,500,000 net ton-miles were hauled. This represented 42 per cent of the total locomotive mileage of the railroad and 56 per cent of the total tonnage hauled.

Recent Features of German Car Design

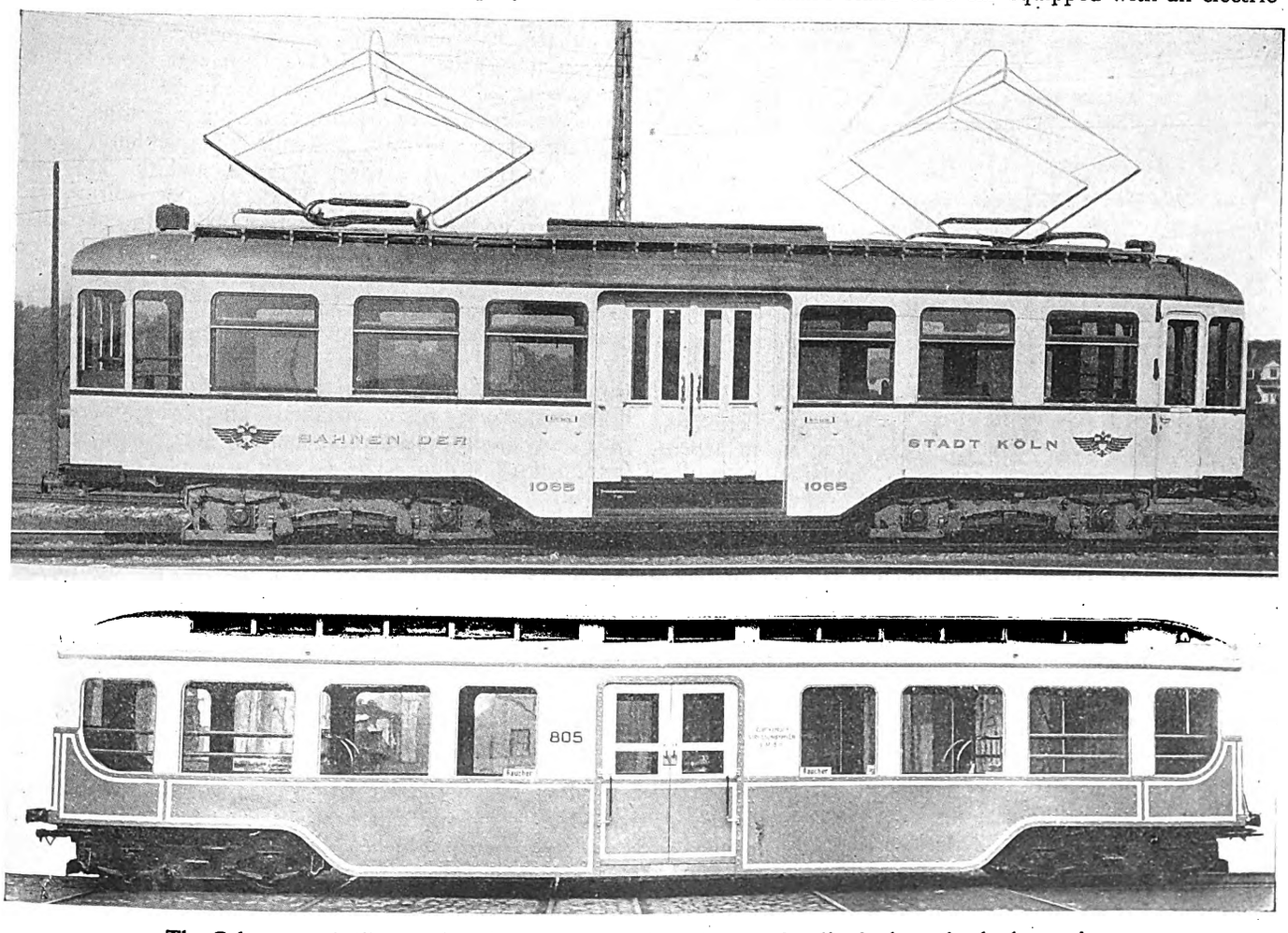
By R. Schwanter

Assistant Engineer City Transit Board, Cologne, Germany

Some methods of track construction in Germany, differing radically from those followed in America, were given in a brief article by the writer in Electric Railway Journal for June 16, 1928, page 979. The article this week relates to correspondingly great differences in car design, as illustrated by cars recently built for Cologne and its neighboring city, Dortmund.

In these cities, as elsewhere in Germany and in some other countries in Europe, the electric brake, particularly the short-circuit brake, is employed extensively. Arguments for and against its use are many, but it may be said that the brakes on all of the Berlin surface cars have been changed from air to electric.

An accompanying illustration shows the appearance of the motorman's stand on a car equipped with an electric



The Cologne car is illustrated in the upper view. The Dortmund trailer is shown in the lower view

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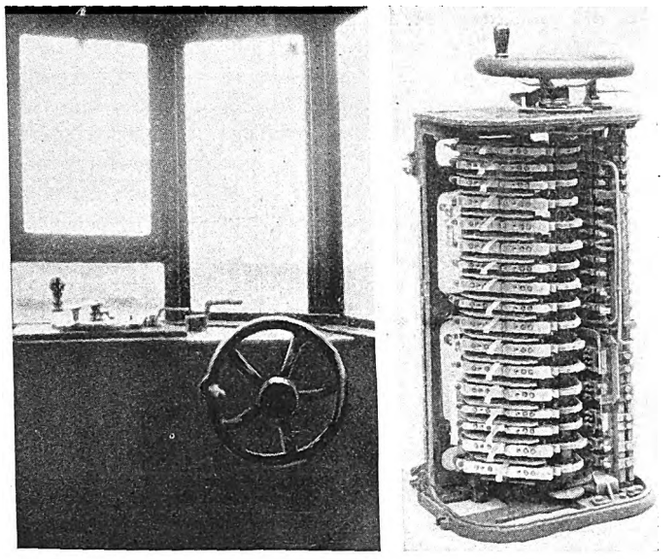
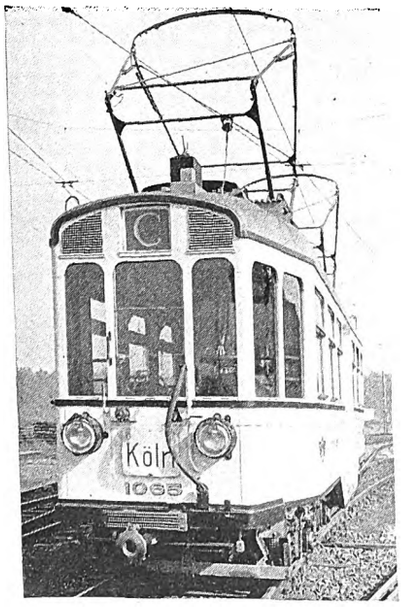


At left, motorman's stand with controller arranged for electric braking. At right, interior of manual controller for four-car train and 1,200 amps.

brake. The power controller drum also contains the brake contacts. Movement of the controller handle clockwise from zero position admits current to the motors for car operation. Movement of the handle counter-clockwise applies the brakes. The other handles shown in the view from left to right are the reversing handle on the controller, the sander handle, the hand-brake wheel and a handle to lock the lifeguard in a raised position if the paving between the rails is under repair. Another illustration gives a view of the latest cam-operated Siemens Schuckert controller, designed for four-car trains with two motor cars and an aggregate capacity of 400 hp. The control is tested for a starting current up to 1,200 amps. and 660 volts.



Front view of the Cologne car

The remaining views are of two recent suburban passenger cars, built by the Linke-Hofmann Works of Cologne. The first three relate to a four-motor car of the city of Cologne, painted white with green lines and gilt lettering. The side exterior view shows clearly the half-sliding, half-folding doors and the coat of arms. Points especially to be noted in the end view are the route designation "C," the ventilating louvers on each side of it and the arrangement of the sash in front of the motorman, with two hinged sections somewhat like the windshield of an automobile. Common American features embodied in this car, though not so frequently found in European cars, are roller shades at the windows and the arrangement to raise the lower sash. The features of the trail car are the low floor and large central loading well.

Guatemala Builds Electric Railroad

Tropical country opened up by electric railway after abandonment of twenty years consideration of steam rack railways

CONSTRUCTION of what is said to be the steepest standard gage electric railway in the world has recently been completed in Guatemala. Plans for this railway, which is known as the Ferrocarril de los Altos, were commenced twenty years ago. At that time several steam-operated rack railways were planned but, owing to the difficulties of the construction and working of a steam railway in the country, had to be abandoned.

Toward the end of 1924 the Allgemeine Electricitäts Gesellschaft of Berlin, Germany, proposed an electric railway connecting the plateau of Guatemala with the existing railway, crossing the southern part of the country and the tropical lowland. Eventually the company secured a contract from the government for the Ferrocarril de los Altos.

The first part of the work consisted in preparing the ground and rock, the construction of a dam across the valley for a 12,000-hp. power station, the erection of a transformer station and overhead transmission lines, the laying of the railway track, and the construction of bridges and stations, including the erection of an imposing station in Quezaltenango, besides the supply of the electric rolling stock.

The railway circles around San Felipe and passes out of the tropical region through the mountains on to the plateau and to the town of Quezaltenango, the total distance being 27½ miles. The track can be divided into three sections, one of 3¾ miles, having a gradient of 3 per cent, on to which the 12½ miles of mountain railway with a gradient of 9 per cent joins, and the 11¼ mile stretch across the plateau. There are ten intermediate stations in addition to the two terminals. In contradistinction to the other Central American railways the Ferrocarril de los Altos has a standard gage of 4 ft. 8½ in.

Energy is furnished by a hydro-electric power station in the neighborhood of the village of Santa Maria, 4,920 ft. above sea level. Two turbines, direct-coupled to three-phase alternators generating current at 2,300 volts, 60 cycles, are at present installed The power station will ultimately house five turbo-generator sets having a total output of 12,000 hp. The railway is supplied with direct current at 1,500 volts from one substation in the power plant and one at Quezaltenango, where the three-phase current, conveyed by a 50,000-volt transmission line, is converted. The current not converted to the use of the railway is transmitted for power and lighting purposes to various neighboring towns, including Guatemala City.

In addition to the construction work, the A.E.G. also delivered the rolling stock, consisting of six passenger motor cars, one passenger motor car for staff use, nine covered freight cars, two flat cars, and two petrol-driven cars for use on extensions and as reserves.

Each car is equipped with a compressed air brake and an electric short-circuit brake, the current generated on downward journeys being dissipated in resistance. They are also equipped with electro-magnetic track brakes, fed by an accumulator battery on failure of the main supply or of the motors. If all the above three brakes fail, a hand brake can be operated.

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Courtesy Is the Key

to Platform Employee Salesmanship

The platform sales job is a peculiar one in that when the passenger boards a car the sale has been made. The sales job of the operator is one of producing continued patronage through simple business courtesy

By R. N. Graham
Manager of Railways Penn-Ohio System, Youngstown, Ohio

Speaking before the summer meeting of the Central Electric Railway Association, held June 26-28 at Cedar Point, Ohio, Mr. Graham propounded a philosophy of the work of the railway man which is somewhat different from that usually given. His point of view is worthy of thoughtful consideration by every operating executive.—EDITOR.

WE HAVE heard it stated many times that we have a product to sell; that our conductors are salesmen; that the superintendent is a sales manager. Perhaps it would be just as well to ascertain just what is the class of salesman to which our conductor belongs. The manufacturer and jobber that sell supplies to our companies describe their product, explain its use, and overcome sales resistance by pointing out the money that is to be saved by using the product. Manifestly, our conductors do not practice this kind of salesmanship.

Merchandise salesmen in stores likewise deal with certain commodities which the prospective purchaser may buy or not, depending on the efficiency and skill of the individual salesman with whom he comes in contact. It is the job of the salesman to convince the prospective purchaser that it is desirable for him to acquire this merchandise. Manifestly, the situation presented in such merchandising does not parallel that presented to the conductor on the street car.

When a patron arrives at a hotel the original sales transaction is already made. The owner of the hotel, the one transaction being accomplished, is interested in making so pleasing an impression on the patron that on future trips he will again confer his patronage upon this particular hostelry. However, the impression that is made and that determines whether the guest will continue to patronize a particular hotel is determined, so far as the effects of human contact are concerned, not only by the clerk but by the bellboys, the porters and numerous other officials and employees with whom he inevitably comes in contact.

The street car conductor's salesmanship requirements are more nearly comparable with those of the hotel employee than with the other classes mentioned above. An important difference, however, is that in the great number of transactions between the street railway and its patrons, the conductor is the sole employee involved. Conditions on a street car and in a hotel are similar, in that when the passenger boards a car the act of selling has already been completed; the merchandising function of the operator is to create a favorable impression so that the effect of the personal contact may give no reason why the passenger should not ride again.

It thus becomes evident that the training of street car employees as salesmen has similar objectives to the training of those many classes of hotel employees who come into contact with the guest during his sojourn; that whereas the hotel management must depend for favorable personal impressions on the combined efforts of numerous employees of different classes, the entire contact of the street railway company with customers during that period of time in which they actually are customers is confined to a single class of employees. The impression produced on the public at large is the sum total of the impressions produced by many individual contacts with individual platform employees. Salesmanship, so far as any positive action on the part of these employees is concerned, becomes identical and synonymous with courtesy.

COURTESY THE OUTSTANDING TRAIT

Now when we stop to think about it, isn't it just plain business courtesy that we expect from our employees in their contacts with passengers, in addition to efficiency in the performance of their routine duties? When we think of a conductor that has our full approval as an employee, don't we think of him as neat and courteous, polite and courteous, friendly and courteous, business-like and courteous; the quality of courtesy always being the essential element? You can call to your mind the personality of a half dozen conductors that are the embodiment, to you, of the business qualities and practices that you would like to have characteristic of your whole working force. Do you ever remember any of these men using a specific sales argument? Isn't it true that they are men who efficiently perform all elements of their jobs and in their relationship with the patrons of the company are friendly and courteous?

On our property we receive numerous letters from our customers referring to individual car operators and bus drivers. I most readily call to mind bus drivers who have had occasion to handle special party trips. Frequently on such trips the driver is in contact with his customers for days and sometimes a week or more at a time. In an extensive business of this character, we have found that we have four or five drivers who are in constant demand by these group passengers. I know these drivers personally. They are alike in possessing certain characteristics; they are clean, neat, good tempered;

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they are all intensely interested in the vehicles that they drive; they are interested in the trips which they take; they are interested in the pleasure and enjoyment that the passengers get out of the trip; capable and efficient in their handling of their buses, yet as I have reviewed them in my mind I cannot visualize a single one of them ever making what might be termed a sales argument. Neither would I know what to suggest to them to say that would further the sale of our product. Their work as salesmen is best performed by the qualities which I have enumerated.

Many of our properties operate cars either generally or wholly with one man; most buses are operated with one man. These operators perform functions other than the collection of fares or the furnishing of information to passengers. They must handle their cars or buses competently, observe rules of operation, be alert in the avoidance of accidents, be honest in financial transactions, be sober, neat and clean. But little of this can be classed as salesmanship. In the volume "Popularizing Public Transportation—1927," issued by the American Electric Railway Association, there are set forth in box displays certain principles which merit repetition: Principle No. 9 is "Salesmanship is a point of view as well as technique."

A Point of View

In my opinion, salesmanship as practiced by the platform employee is almost wholly dependent on a point of view. If the platform employee has it firmly fixed in his mind that the relation of the passenger to the company is determined by his own dealings with that passenger and that his prosperity and his job depend on that relationship, then good salesmanship in that employee's contact with passengers, may be expected.

The next principle is: "Manners make the salesman of transportation." Certain companies have gone to the extent of having operators make house-to-house canvasses to sell tokens or passes. Certainly no harm is done by such practice, but the ability of the employee to sell tokens or to sell passes under such circumstances is certainly no measure of his efficiency in his own peculiar selling job. I would not measure the efficiency of platform employees as salesmen by their ability to sell some intrinsic article; by their ability in arguing controversial questions in which the company might be interested, but almost solely by the reaction that they produce upon the passenger by their manner in carrying out the specific duties devolving upon them in their particular employment.

How are we specifically going to develop this selling quality which I make synonymous with courtesy? Will we develop it by a school of instruction? Certainly the new employees should be instructed in all the elements that go to make up their job, and since the matter of courtesy is of such major importance it should be emphasized and re-emphasized in the instruction. Are we going to develop a series of parrot-like answers to certain questions that may be asked, or phrases to meet certain conditions? Yes, because long experience has demonstrated that certain phrases cannot give offense and they are not parrot-like when used in proper manner by an employee with the proper mental attitude.

Are we going to permit men to remain on the platforms of our cars and buses who have not the necessary calmness and proper mental attitude? Surely the survival of a business that we believe one of essential convenience is of more importance than the tenure of one individual on a job for which he is not adapted. There is always some position that can be filled by a man who is industrious and efficient but who happens by nature to be a grouch or quick tempered. Are we going to permit disputes and arguments when the disputes and arguments at most can involve only a small coin or token, or are we by our rules going to transfer such arguments to our general office where we know that under all circumstances they can be handled with calmness and discretion? It is unnecessary for me to answer any of these questions. The answers are obvious.

Inculcation of Courteous Manners a Goal to Seek

The goal which we seek is to inculcate courteous manners in the platform personnel as a matter of business. There are three policies which, if faithfully pursued and carried out, go a long way toward reaching this end. The first is: let no public praise for courteous action be unnoticed; communicate every letter or message calling attention to the performance of a trainman or bus driver to the man involved. If a company organ is published, such letters should be printed; they should be posted on bulletin boards and due official credit given for the act which provoked the letter. Secondly, courteous conduct cannot be expected from employees who themselves are not the recipients of the finest example of such conduct. Therefore, suggestions from the platform employee should be welcomed; complaints should receive careful and painstaking consideration; questions should be answered frankly and fully; changes in schedule, in operating methods, even in fare collections, should be thoroughly explained in advance of taking effect; supervisors and instructors should be required to treat men with consideration, refraining from profanity or quarreling over trifles; rebukes or discipline should never be publicly administered.

Last, but probably most important of all, continuous contact must be maintained between the platform personnel and the official organization so that courtesy training may be a never-ending process. This contact must be other than that obtained during instruction when first employed; than that resulting from negotiations over wages or working conditions, or that which comes about through discipline. It must be a friendly contact, carefully nurtured and developed.

On our property we have had at least every 30 days, for five years, a dinner attended by some section of our working force, and also attended by officials of the company. In five years of constant meetings of this kind there is the opportunity to talk on operating practices without preaching. Results can be accomplished that are impossible in a classroom or in a mere sporadic meeting held now and then, in which the contact is almost certain to be official and formal. After years of meetings of this character, the platform personnel reflects the management's attitude to the public. If the official organization is "hard-boiled" and unsympathetic, the men will possess the same qualities; if the official organization believes in sincere, honest, courteous dealings with the public, the men must inevitably reflect the same tendency.

You have all been in hotels where you sense that courtesy is the keynote of the organization. Strangely enough, many times you find that atmosphere where the least is said about it in leaflets, pamphlets and propaganda. If courtesy is the guiding spirit of a transportation organization, there is little more left of the problem of salesmanship.

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Concrete for Street Railway Track

Cincinnati Street Railway uses concrete for track foundation and pavement as standard. Method of relaying track on Madison Road is typical of this railway's practice

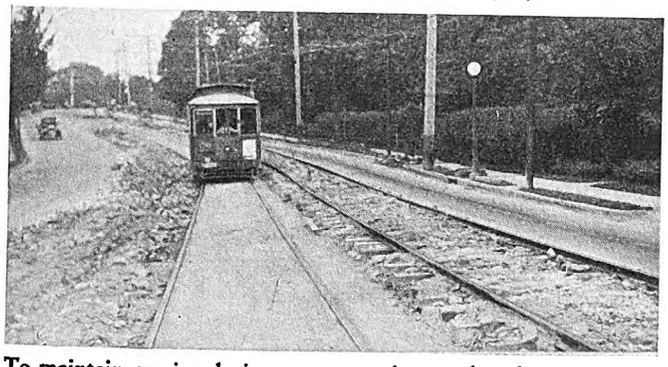
By C. C. Boone
Portland Cement Association, Columbus, Ohio

For several years street railway tracks in Cincinnati's paved streets have been laid on a concrete foundation. It was necessary, therefore, for the Cincinnati Street Railway, when it decided to relay the track on Madison Road and repave the road surface, to tear up a track laid in concrete ten years ago.

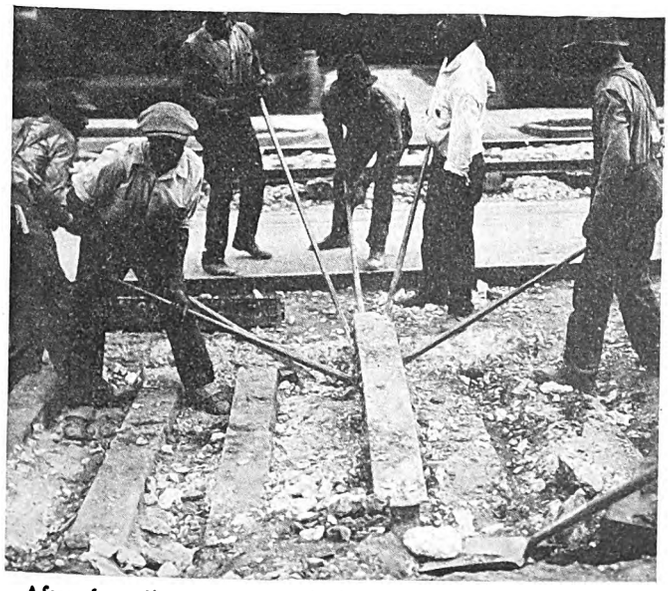
The old track consisted of 7-in., 96-lb. Trilby rails spiked to wood ties. Around the ties, to a depth of 6 in. under them and 4 in. above, was a foundation of 1:3:6 concrete. Upon this foundation was a wood block pavement conforming to the type of surface used on the balance of the street. The wood blocks were laid in the customary manner and the interstices filled with sand with only a small expansion joint between them and the rail. No tar was used. This bond loosened and made it necessary to relay the track.

Madison Road has a double-track car line and carries heavy vehicular traffic as well as the trolley cars. To maintain service during reconstruction one track was completed at a time. A temporary track was built along the shoulder using as ballast materials excavated from the track under construction.

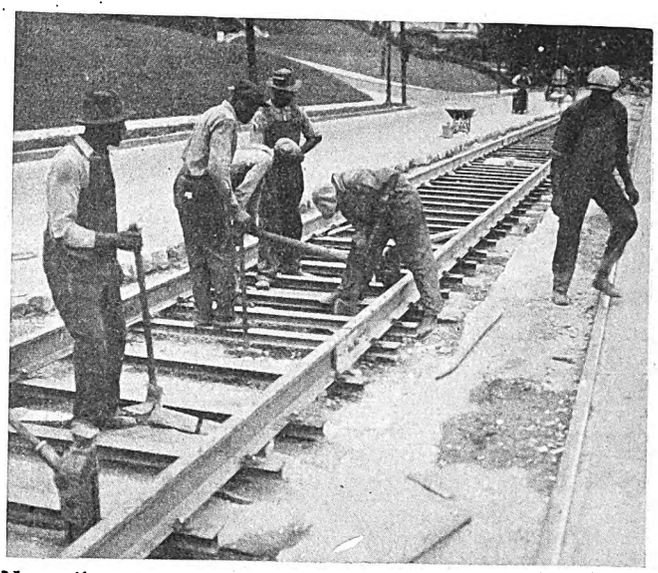
After the wood blocks had been removed the concrete around the base of the rails was broken loose and the rails were pried out. Then the concrete over the ties was broken with hammers and drills and the ties were lifted out with crowbars. The depressions caused by removing the ties left the old base very rough, assuring a good bond between it and the new concrete to be placed above.



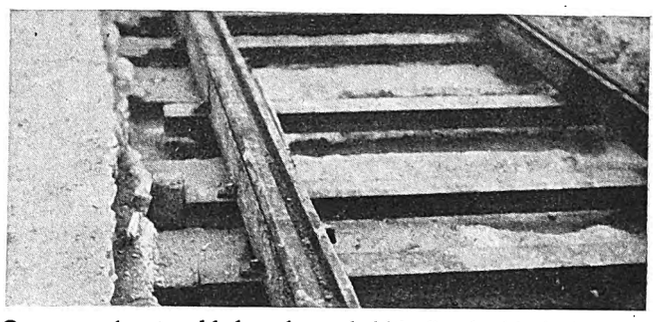
To maintain service during reconstruction work only one track is torn up at a time and a temporary track is laid. The temporary track as shown on the right is ballasted with material excavated from the track being rebuilt



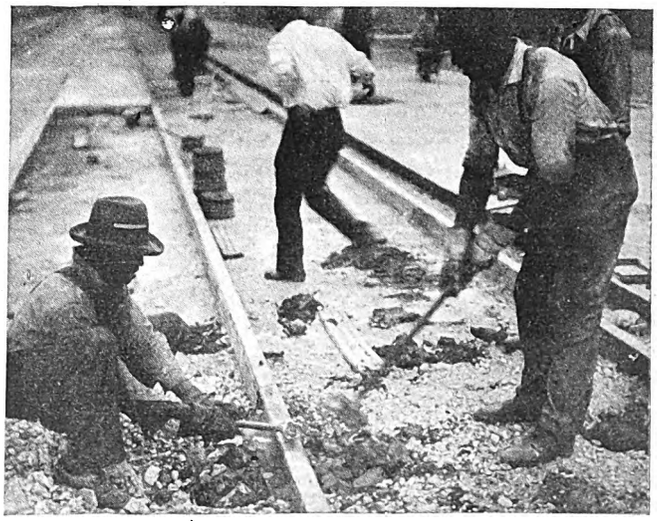
After the rails were removed, the concrete over the ties was broken and the ties pried loose with crowbars



New rails and steel ties were bolted together and the assembled track brought to grade with jacks



On curves the assembled track was held in line by blocks between the track and pavement edge



Cutting away excess metal at a welded joint. All bolts were spot welded and joints thermit welded

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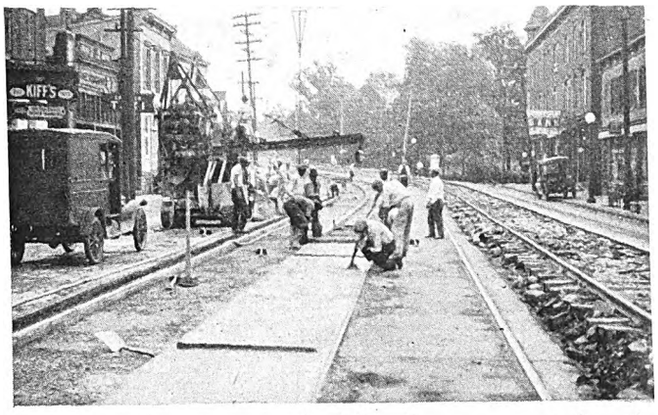

Concrete-pouring gang at work. The mixer was operated on the highway at the left of the track

The completed area. Workmen are removing the temporary track crossover used during the construction

The base was thoroughly brushed to remove all loose particles of concrete when the entire track had been removed and new 93-lb. T-rails were laid in place. They were bolted to steel ties and the assembled track brought to grade. The proper grade and alignment was maintained by placing wood blocks under every third tie after the track had been jacked to position. On curves the track was braced by inserting blocks between the ties and the adjacent pavement.

After the track was in grade and in line, all bolts were spot welded and joints thermit welded. The joint welds were later smoothed by cold cutting and grinding.

A premolded elastic material was placed along both sides the rail web and a bottom course of 1:3:6 concrete poured. This course extended from the old grade to within 5 in. of the top of the rail. The concrete was carefully tamped around the ties and rails to assure a good bond and perfect support. On new work the base course extends 6 in. below the ties.

After the base course had hardened, a 5-in. wearing course of $1:1\frac{1}{2}:3$ concrete was laid. Expansion joints $\frac{1}{4}$ in. wide were inserted at 30-ft. intervals, and the edge of the street pavement, 18 in. from the rails, was painted to prevent the bonding of concrete of the highway and that in the track area.

The cost of rails, steel ties, concrete and the construction work averages $10 a lineal foot for single track in Cincinnati.

P.R.T. Central Parking Area to Relieve Congestion

SEVERAL years ago large parking fields were established by the Philadelphia Rapid Transit Company at the terminals of its Market Street-Frankford elevated, to influence autoists to park their cars elsewhere than on the crowded downtown streets. Now a new parking area has been added to the chain of fields, this one in the very heart of the city.

The property being used for the parking area is on Locust Street between Broad and Fifteenth Streets, just across from the Mitten Building, where the P.R.T. and Mitten Management offices are located. The property will eventually be the site of a combination bus terminal and public garage.

The company, in its announcement to the public, stated that the area would be operated on a no-profit basis, a fee of but 25 cents being charged for an eight-hour period. Since the only other near-by location for off-street parking charges a minimum parking fee of 50 cents, it is evident that little effort is required to keep the P.R.T. field filled during the daytime and evening

Parking area conducted by the P.R.T. where Philadelphia motorists can store their cars for an eight-hour period for 25 cents

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hours. It has a capacity of 160 cars and a staff of seven attendants is required to handle the field on an efficient basis.

At night the Locust Street field is well illuminated with powerful floodlights located on tall poles near each of its four corners. Twenty-four-hour service is given, at least one man being on duty at any hour of day or night. Cars are checked in and out through the Locust Street entrance. The times of entering and the license numbers of the automobiles are entered on the parking tags. For cars which are parked more than eight hours an additional charge of 5 cents per hour, with a maximum of 75 cents for 24 hours, is made.

The parking situation in Philadelphia is particularly acute and the construction of double-deck streets and the widening of existing thoroughfares has been suggested from time to time. The company feels that parking areas in the downtown district would relieve the situation, and is pointing to the Locust Street field as an example of what can be done in this respect.

Automatic Safety Signals on South Shore Line

SAFETY signals of the automatic type on the open right-of-way of the Chicago, South Shore & South Bend Railroad will be in operation from South Bend to Chicago with the conclusion of installation work now under way, according to a recent announcement of Charles H. Jones, general manager. The present program contemplates the installation of double-track signals from Gary to Kensington, exclusive of cities. A new high-speed siding at Tamarack, four miles west of Michigan City, will be protected by switches and signals also.

The new double-track signals between Kensington and Gary are spaced so as to allow fifteen-minute intervals between trains. They are of the three-color light type, with special protection over the bridge gauntlets and approach locking through interlocking plants. When a train has accepted the signal 1 mile in advance of the interlocking plant the operator is prevented automatically from making any change in the routing of trains, and from allowing any other trains to enter the plant. Arrangements like this will be in effect at Shearson, State Line and Kensington.

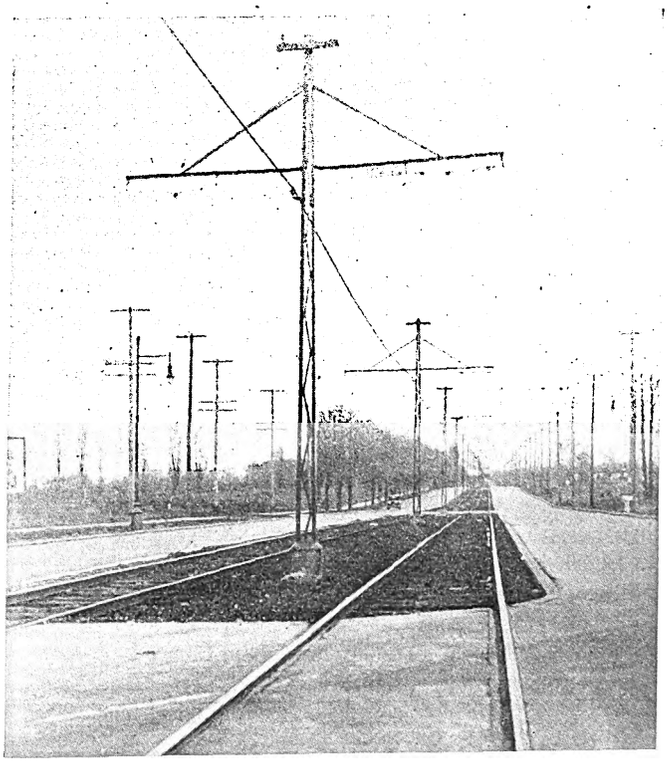
The signal protection at the new Tamarack high-speed siding will allow trains to pass in and out of the siding without stopping. The switches are of the spring type except for westbound trains. If anything happens to the switch, or should the points open up $\frac{1}{8}$ in., the signal ahead of the point will flash danger, stopping the train before the switch point is reached.

The signal installation will cover approximately 15 miles. A gang of 30 men including laborers will spend the larger part of the summer months on this job, which is under the direction of Ben L. Smith, supervisor of signals for the South Shore Line.

Louisiana-Mississippi Committee Reports

IN A twenty-page booklet the report of the fifth year's work of the Louisiana-Mississippi Committee on Public Utility Information is published. H. M. Blain, director, referred to the co-operative spirit of utility companies now in comparison with some time ago on the matter of publicity. In previous years, he states, the Public Utility Information Bureau had to give up after writing several letters for special utility progress stories, but recently the bureau had been able to get similar material from almost all companies through only one request. The distribution of utility literature to schools is recorded and the activities on public speaking are reviewed.

Completed Island Track Construction in Erie, Pa.



EXTENSIVE construction work on Erie Lake Road as carried out by the Erie Railways was described in an article on page 784 of the Oct. 22, 1927, issue of ELECTRIC RAILWAY JOURNAL. At that time the work was in progress and construction pictures were the only ones obtainable. The view shows the completed construction with the track in the center and a paved driveway on either side.

The Readers' Forum

Traffic Control a Vital Issue

GENERAL MOTORS TRUCK CORPORATION
PONTIAC, MICH., July 20, 1928.

To the Editor:

In your issue of July 7 there appeared an editorial entitled, "Signals Should Move Traffic, Not Stop It." I read this article with great interest. It is a subject which in my judgment has been too long neglected. Of course, much has been written on the question, but little that has been written has been constructive or educational. It would seem to me that this subject is one that could be pursued much further not only in the interest of the street car and bus industry, but in the interest of society as a whole, since practically everyone is affected directly or indirectly with things which have to do with the movement of traffic.

JOHN A. RITCHIE,
Chairman of the Board.

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Maintenance Methods and Devices

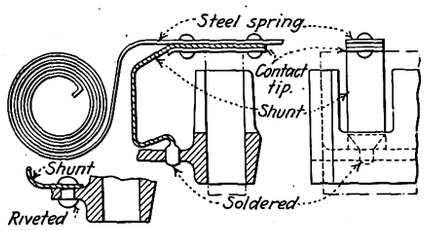
Fastening Shunts to the Body of Brush-Holders

By John S. Dean
Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

On the older railway motors it was common to use carbons fitted with shunts or pigtails. These were considered essential to help carry the working current into the carbons, and thus keep it from passing through the pressure finger mechanism of the brush-holders. In practice these shunts tend to work loose and quite frequently are left off through carelessness, thus allowing the current to pass through the bronze pressure springs. Then the heat anneals the bronze and the springs lose their tension. Frequent adjustments are needed to maintain the proper tension on the carbon brushes.

Brush-holders used with modern railway motors are designed with a heavy braided shunt connecting the contact tip on the pressure finger to the body casting. This makes it possible to use plain carbons and eliminates pigtails, which always were considered more or less of a nuisance, especially by the men in charge of their maintenance. Two general methods are used to attach these shunts to the brush-holder castings. These are riveting and soldering. As some trouble has been experienced with the riveted type working loose and getting hot in service, modern brush-holder practice is to use the soldered connection almost exclusively.

In making repairs to brush-holders using this latter method it is essential to do a good soldering job. Parts to be soldered should be cleaned well and then tinned. A soldering tool of fairly good size should be used. One weighing about 3 lb. gives good results and holds the heat for a long time. The iron should be kept well tinned and the surface filed clean. After heating the iron should be dipped in a strong solution of zinc chloride. This is made by putting zinc in commercial muriatic acid until no more will dissolve. A good hot iron is essential for proper work. The solder should be rubbed on the hot iron and a zinc chloride flux used. A handy form of solder comes in thin strips 10 in. to 12 in. long. Ordinary half and half solder is satisfactory.

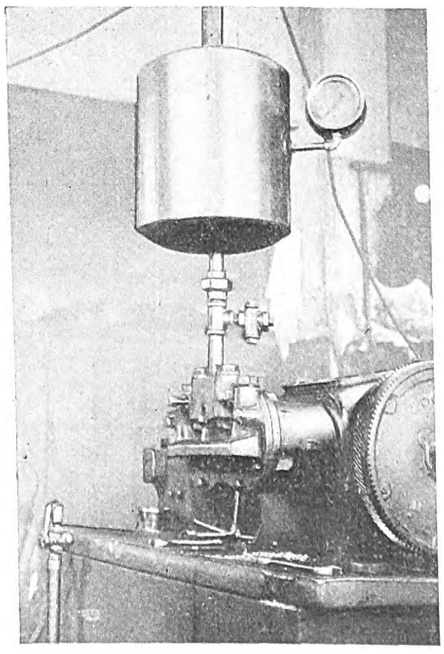


Method of attaching shunt to twin washer brush-holder mechanism

Air Compressor Testing Equipment

Final testing of air compressors has been simplified in the shop of the New York & Harlem Railroad, New York City, since special testing equipment was constructed. The air was pumped into a 16x48-in. reservoir prior to the adoption of this outfit. This not only required a longer time to obtain the pressure required but increased the energy consumption and caused a longer period of idleness for the mechanic. The apparatus shown in the accompanying illustration is portable and can be installed or removed in a few minutes. It consists of a 13x14-in. reservoir with welded seams, a standard safety valve, a gage and a valve with the necessary pipe fittings. The outlet of this valve is plugged. A hole is drilled through the center of the plug so that there is a small air exhaust when the valve is opened and the compressor is under pressure. This leak corresponds to the average leakage which exists in a car.

When the compressor is ready for test the apparatus is installed in the outlet, the valve opened and the pump started. As the pressure increases the air escapes from the drilled plug. The compressor must pump air to 100 lb. pressure against this leak in a predetermined time. When this pressure is reached the valve is closed off, the compressor stopped and the gage observed for any drop in pressure. This is done to determine if the valves, rings, etc., are fitted properly. If the compressor pumps to 100 lb. pressure in the proper time against the exhaust and there is no appreciable drop in pressure the compressor is pronounced OK for service. The pressure is then released and the apparatus removed.



Compressor testing equipment in shops of the New York & Harlem Railroad

Convenient Forms Assist Bus-Maintenance*

By D. S. Mackay
Supervisor of Bus Maintenance Boston Elevated Railway, Boston, Mass.

When the Boston Elevated Railway began the equipment of its buses with tires purchased on a contract mileage basis, considerable difficulty was experienced in keeping track of tire equipment or changes necessary due to puncture, wear out or other causes. To assist in keeping records of the correct mileage performed by each individual tire, one of the clerks in the rolling stock department devised the four forms illustrated.

The 5x8 in. card, Form 3791, is used at all bus garages. On it information of the original equipment is entered at the top of the card. Each change thereafter is entered

**Submitted in* Electric Railway Journal maintenance contest.

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underneath and the record is continued on the back of the card. These cards are set up numerically by way of property bus numbers, and are of great value, for at any time the card for any particular bus can be picked out and a complete record obtained of all the tires on it, together with tire changes, date, positions, cause of removal, mileage, etc.

Form 6478 is used by the men who change tires. When a change is made this form gives full information. It is filled in by the man who makes the change, signed by him and then turned in to the garage office.

The record is transferred to Form 5765 by the garage clerk, and at the same time this is forwarded to the office of the supervisor of automotive equipment. Upon receipt of these reports the changes are recorded on Form 5766, this being the final report. Five copies of this are made out, and forwarded to the superintendent of rolling stock and shops, to the bureau of audit, to the purchasing department, to the contract party and to the office files.

The four forms illustrated are used in conjunction with each other and were drawn up and printed for the sole purpose of keeping a correct record of tire mileage on a contract basis. At the present time the company is operating approximately 1,500 tires on a contract basis, and with this large number there is practically no error. A large saving has resulted in keeping records of tires along with the elimination of much confusion which existed before the system was inaugurated. All mileage is abstracted by the audit bureau and by the tire companies from these reports, and invoices are submitted to the company monthly of the mileage operated.

Form 6478 11-27-10m 63

GARAGES
TIRE CHANGE

This slip must be properly filled in for each Tire change and turned into office immediately

Car No.
Bus No. Date 192

Position

New ☐
Name Tire Applied Rep'd ☐

No. Tire Applied

Name Tire Removed

No. Tire Removed

Cause of Removal

Changed by

Form 3791 3-27-1m 63

BOSTON ELEVATED RAILWAY

Motor Vehicle No. TIRE RECORD CARD Dept. R. S. and Shops

Date Tires Put In Service	Name of Tires	Size	Original Tire Equipment		
			Right Front	No.	
			Left Front	No.	
			Right Rear-Inside	No.	
			Right Rear-Outside	No.	
			Left Rear-Inside	No	
			Left Rear-Outside	No.	
			Spare Tires	No.	

RECORD OF TIRE CHANGES

Date	Position	Number of Tire Put On	Number of Tire Removed	Cause of Removal	Milage

To

Boston Elevated Railway

Date

LETTER NUMBER

Dear Sir—

I wish to report that on date of
the following tire changes were made on Boston Elevated Railway.

Motor Bus Number Contract Basis.

Name and Size of Tires

Name of Garage

TIRES PUT ON—Right Front Number
" " " —Left Front Number
" " " —Right Rear-Inside Number
" " " —Right Rear-Outside Number
" " " —Left Rear-Inside Number
" " " —Left Rear-Outside Number

TIRES REMOVED		CAUSE OF REMOVAL
Right Front	No.	
Left Front	No.	
Right Rear-Inside	No.	
Right Rear-Outside	No.	
Left Rear-Inside	No.	
Left Rear-Outside	No.	

Very truly yours,

Supervisor

BOSTON ELEVATED RAILWAY DEPT. ROLLING STOCK & SHOPS

NOTIFICATION OF TIRE CHANGES

Name of Garage Date

I wish to report that on date of
I made the following tire changes on Boston Elevated Railway.

Motor Bus Number

Name of Tire Size of Tire

TIRES PUT ON—Right Front Number
" " " —Left Front Number
" " " —Right Rear-Inside Number
" " " —Right Rear-Outside Number
" " " —Left Rear-Inside Number
" " " —Left Rear-Outside Number

TIRES REMOVED		CAUSE OF REMOVAL	MILEAGE
Right Front	No.		
Left Front	No.		
Right Rear-Inside	No.		
Right Rear-Outside	No.		
Left Rear-Inside	No.		
Left Rear-Outside	No.		

This report must be made out promptly upon any changes of tires on contract basis—PREFERABLY IN INK—and forwarded immediately to the Albany Street Garage.

SIGNED:

GARAGE FOREMAN

Forms used for keeping track of tire mileage by the Boston Elevated Railway

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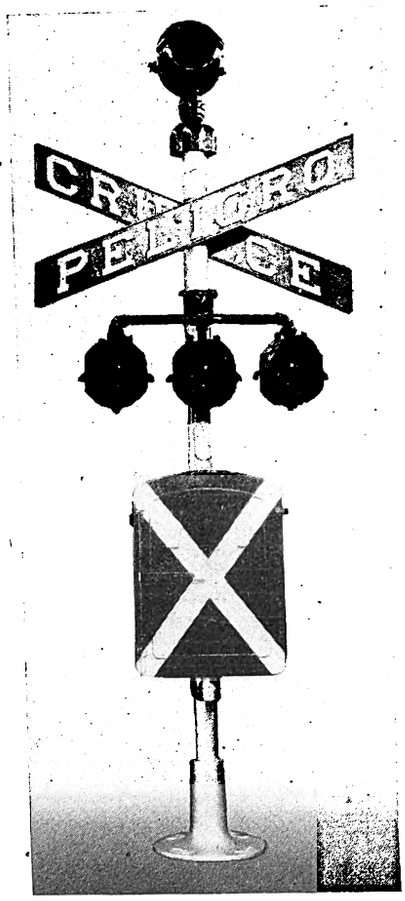
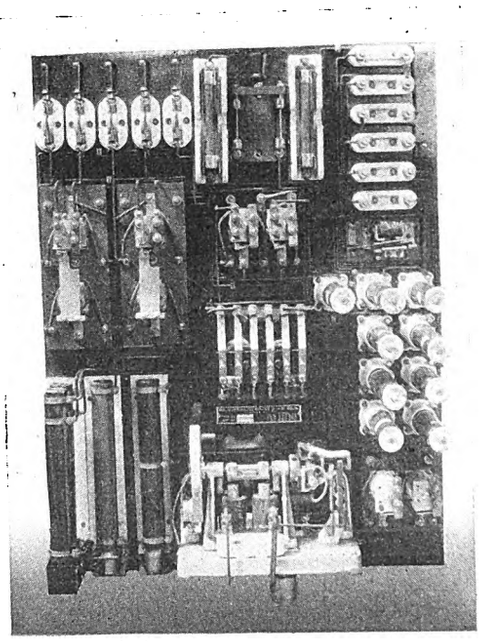
New Equipment Available

Crossing Signals for Peru

HIGHWAY crossing signals recently made for the Lima Light, Power & Tramways Company, Lima, Peru, by the Nachod & United States Signal Company, Louisville, Ky., embody some interesting features.





At left—One of the new crossing signals recently made for the Lima Light, Power & Tramways Company

Above—The relay panel taken out of the relay box, containing the various relays, the mercury-type flasher relay being shown at the bottom of the panel. Disconnecting switches are provided as shown at the top

A signal is placed on one side of the track, containing the bell, light indication and control box, together with the crossing sign with Spanish wording, meaning, "Crossing—Danger." A similar crossing standard is placed on the other side of the tracks but is without the control box or the bell. The relay and overhead contact system are for a double-track grade crossing of an interurban line with a highway. Normally when no car is approaching, the middle projector displays a green light, but when a car approaches the starting contactor about 1,200 ft. in advance it starts the operation of the warning, the green light is extinguished and the two outer red lights are flashed alternately by means of a flasher relay in the relay box. At the same time the red projectors flash, the 12-in. vibrating bell rings, thus giving both an audible and visual indication. In order that the motorman may know that he has started the signal in operation, a telltale or pilot is provided about three spans in advance of the starting contactor consisting of a hooded light signal, normally dark, which is then lighted up. The warning continues until the car passes under the stopping contactor beyond the highway.

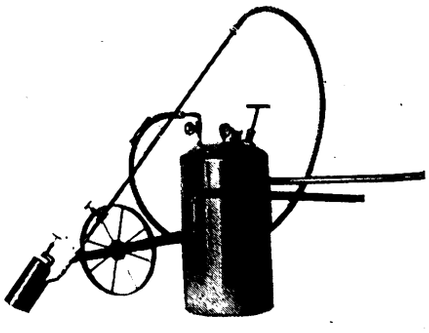
The other track is similarly equipped with trolley contactors and indicator. Separate relays are installed for each track so that so long as a car on either track is between the starting and stopping contactors, the warning will continue to be given.

The control of these signals is on the normal closed-circuit system. Should the relays drop for any cause, as through defective contactors, broken line wires or burnt out relay coils, the warning indication will call attention to the derangement. In order to prevent excessive ringing of the bell, a thermo-relay is provided as a time element cutout, which will stop the bell after, say, one minute's ringing and thus prevent annoyance to the neighborhood. In such an event, the lights continue to flash until the relays are picked up again. All current to ring the bell, flash the lights and control the relays is taken from the 550-volt d.c. trolley circuit. The projectors utilize 50-watt lamps, series connected, and shunted by resistors so that the burning out of a lamp does not open the circuit to the remaining lamps. The form of pipe brackets for the projectors serves to enclose the wiring and yet permit of pointing the projectors in any direction. The projectors have parabolic mirrors with 30 deg. Spredlite roundels.

Wheelbarrow Mounting for Oil Burner Tank

INCREASED use of kerosene torches in railway and highway service has resulted in the production of large capacity tanks for such equipment which are too heavy for handling by one man. To avoid the necessity of using two men for such kerosine burners the Chausse Oil Burner Company Elkhart, Ind., has announced a model with the tank mounted on a wheelbarrow. This outfit can be transported easily by the man who does the work.

A conventional type of welded steel tank with a capacity of 14 gal. of kerosene is mounted in tubular steel shafts with a single wheel. The kerosene burner is attached to the tank by means of a heavy-duty pneumatic tool hose. The tank has a self-contained air pump and pressure gage. The burner handle is steel with wooden grips and a convenient needle valve.



New type mounting for heavy kerosene tank used with oil burner

The burner is self-generating and produces a temperature from 1,750 to 1,800 deg. F. The volume of gas is considerable and makes this outfit adaptable to such work as preheating for welding, thawing, melting snow on tracks and switches, and wherever an intensely hot flame is desired.

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Association Activities

Systematizing Bus Maintenance*

Accurate records make it possible to locate the causes of defects and so to prevent their recurrence. The forms discussed are used on a property operating some 75 buses

By L. McInerny
Master Mechanic San Antonio Public Service Company, San Antonio, Tex.

MORE than 50 per cent of the street railway properties in the United States are now operating some bus service, according to recent reports. This, supplemented by the continued purchase of buses by street railways, insures that bus maintenance is, or soon will be, a problem for the majority of electric railway maintenance men.

A satisfactory bus maintenance program for any property will, of course, be determined somewhat by the type of vehicle operated and by the service requirements. Our method as outlined in the following is still in process of development. It is offered for what the experience gained in the operation of 8,000 bus-miles per day may be worth.

Effective bus maintenance appears to be necessarily based on these five requisites: (1) Capable mechanics; (2) accessible supply of standard repair parts; (3) modern and ample shop facilities; (4) a definite and pre-determined inspection, lubrication and overhaul schedule; (5) effective supervision through accurate and graphic records.

Capable Mechanics

The introduction of modern and complex bus equipment, has made the need for qualified mechanics more apparent. In San Antonio only mechanics are engaged who have had as a grounding a course in manual training or trade school instruction in auto mechanics, supplemented by practical experience. Then, to keep the thought of their qualifications prominently in their own mind, as well as in the mind of their foreman, the latter is required to fill out and file twice a year in the shop office a qualification card, rating each man on his knowledge of the work, his industry, physical and mental qualities, care and disposition. Thus the foreman is prepared to assign his men to the most suitable work, the men being specialized as far as possible on some particular job such as inspection, electrical repairs, brakes or motor overhaul.

Mechanics are encouraged to enroll in night or correspondence school courses in their line of work by a standing offer to refund the cost upon the completion of the course. The study of their work is further encouraged by the reading of prepared papers at monthly meetings of shop foremen.

Accessible Supply of Standard Repair Parts

Assuring a supply of replacement parts is a problem that immediately follows the introduction of each new type of bus. Occasionally a considerable lag appears between the delivery of new equipment and the setting up of a functioning parts supply department by the bus manufacturer. The manufacturer should realize that the operator lacks information as to what constitutes a reasonable supply of parts for the particular type of equipment, and the latter has a natural reluctance to invest heavily in a stock of parts that may not be immediately required. Our experience indicates that the stocking of a complete variety of repair parts clearly labeled and indexed in a supply room included in or immediately adjacent to the garage is essential to economical and effective bus maintenance.

Modern and Ample Shop Facilities

All buses of this company are serviced at one garage, which adjoins the car house and shop. The carpenter, paint, blacksmith, machine, and welding shops are used in common for buses and street cars. However, certain bus maintenance facilities are required in addition. The climate in San Antonio permits of open yard parking throughout the year, the shop proper, including inspection pits and service station, being the only roofed area. Pit facilities are in the ratio of one for each twelve buses owned. This appears to be inadequate and it is believed it should be increased to a ratio of at least one to eight.

In addition to the rather complete set of hand tools which each mechanic is required to possess, and to the smaller special shop tools such as gear pullers, jacks, engine stands, portable drills, valve refacers, and high-pressure lubricating guns, some type of overhead crane and hoist, an arbor press, a universal test rack for electrical equipment, a battery charger, a brake tester, and an engine and chassis spray cleaner are considered practically indispensible. Equipment will, of course, vary somewhat in detail according to the number of buses maintained and the policy of the operating company with regard to investment in shop equipment.

One unit which appears to afford a good return on the investment where the volume of oil draining justifies is an oil reclaimer. Our experience records 80 per cent of drainings salvaged at a reclamation cost of 20 cents per gallon.

Inspection, Lubrication, and Overhaul Schedules

Since effective maintenance is not so much a matter of making repairs as of anticipating the need of repairs, a well-balanced inspection, lubrication, and overhaul schedule is probably the most important factor. Nightly servicing covers gasoline, crankcase oil, radiator water, and casing air pressure inspection. Other inspection and lubrication of buses is on a mileage-time basis by predetermining a mileage interval and translating it to a time interval. These are based on a 500-mile service expectancy, or twice a week. The fleet of buses is divided into seven groups, a group becoming the inspection quota for each day. This means the inspection cycle covers one week and that the schedule assigning certain bus numbers as quotas for particular week days will repeat indefinitely without derangement. The inspection and lubrication are recorded on a card, one side of which lists the detailed work of the day crew and the reverse side showing that of the night crew. This form also shows the lubricant to be used for a given operation. A thorough overhaul is given each bus yearly, or after approximately 50,000 miles of service. A supply of the smaller spare units such as generators, transmissions, differentials, cylinder heads, etc., is kept available for service, and if trouble develops between overhaul periods, the defective unit is replaced by a reconditioned unit. The defective unit is in turn reconditioned and placed in stock.

Records and Supervision

The details of all repairs rendered to buses, whether on trouble calls, defective buses relieved, or operators' after-service reports are recorded on cards by the mechanic making the repairs, these cards being filed under the bus number. As the first duty each morning, all service repairs required the previous day are entered on what is termed the bus trouble chart. This is a large sheet of paper with ruled lines listing all bus numbers in the fleet vertically at the left and the dates of the month horizontally along the top of sheet. All bus defects are recorded by using the letters of the alphabet as symbols. These symbols for the previous day are entered under the proper bus numbers and date. It affords a graphic history of all defects, or any particular defect for all buses, or the defect history of any particular bus as far back as it is desired to go.

This chart is used to give immediate

**Abstract of a paper presented before the semi-annual meeting of the Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio, July 25-27, 1928.*

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notice of the trend of defects, as well as any appreciable change in the number of particular defects; and to detect any repeaters. Cases of this nature are immediately called to the foreman's attention by a blue card citing previous similar reports and requiring immediate attention. The chart is used to track defects which apparently are due to the failure of a mechanic or inspector to properly perform his duty. This is done by checking through the file to determine when and by whom the repair or inspection was rendered. If it appears to be a man failure, a form with details filled in, is sent the individual.

The written form is used in preference to the oral in calling attention of mechanics to failures of importance. It is believed that having the mechanic explain the failure in writing, with the knowledge that unless satisfactorily explained it will be filed in his personal record, clothes the occurrence with more importance in the mechanic's estimate and makes correction more effective.

Other records maintained are an equipment card for each bus on which is recorded all important repairs and changes in equipment—together with date, mileage, and cause; a mileage sheet for each bus showing daily mileage and mileage to date; and a casing record showing the type, serial number, cost, period of service, and mileage rendered by each casing.

Curves are plotted for each bus to show the gasoline and oil mileage, and also to show total maintenance cost for each group of buses, classed according to make and size.

Monthly bulletins are posted for the information of shopmen, summarizing the pull-ins, repeaters, and inspection failures during the month and comparing the record on a mileage basis with the preceding month and year.

Average miles operated per bus failure during the six-month period ending June 30, 1926, were 2,045, compared to 2,381 miles for a like period of 1927 and 3,337 miles this year to date. Although average age and size of units has increased appreciably, bus maintenance cost per mile operated records a 9.3 per cent decrease during 1927, and a 11.4 per cent decrease for the year 1928 to date, compared to the 1926 base.

Employment and Training Methods in San Francisco*

By L. A. Bragg
Superintendent of Employment and Training, Market Street Railway

REALIZING the value of the proper selection and training of men for platform service the Market Street Railway some few years ago set about to develop methods to meet its own peculiar requirements. At that time it was the practice to assign recruits to line instructors who, having broken them in on one line, would turn them over to a different instructor for breaking in on another, and so on until the entire division had been covered. This led to a considerable duplication of effort and the general results were unsatisfactory.

We therefore inaugurated a system of assigning one instructor to break the student in on all the lines in his division, and holding him responsible for the results obtained. In order to perfect the system and to stimulate interest among the instructors, weekly meetings were held at which there was open discussion and a general exchange of opinions as to the methods to follow to secure the best results. The ideas brought up at these meetings were given practical tests, and the results observed and discussed at subsequent meetings. This process was followed out until all concerned were satisfied that we had decided upon the best method of handling each phase of training.

*Abstract of a paper presented at a meeting of the California Electric Railway Association, San Francisco, Cal., May 7-8, 1928.

While the development of this training process was followed with close attention by the management of the property, the significant fact is that the system is the product of the line instructors themselves. These men naturally feel that the idea is their own and they accordingly enter into the spirit of the thing with greater zest and interest than they would had it been prepared otherwise. To this feature can be attributed its major success.

As each instructor is held personally responsible for the performance of his students, not only while the training is in process, but during the entire probationary period, a keen and friendly rivalry has sprung up among them in their efforts to outdo one another and to turn out men who will be a credit to their efforts and to the company for which they work. In order to stimulate this interest a careful check is kept on the performance record of each man trained, covering knowledge of rules, efficiency, care in avoiding accidents, deportment, etc. These averages are published from time to time in the company's house organ, and credit for excellence is given to the instructor responsible for the man's training.

In addition to the preliminary work done by the line instructors we have also established a follow-up system of instruction, extending through the probationary period of three months, during which time the men are given such additional training as appears necessary.

At the time this new system of training was inaugurated the employment and training departments were combined under one head and placed in charge of one man. To this can be attributed a great deal of the success attained, as more or less friction between departments has been removed. We do not pretend to have developed any new or unusual methods of selecting men for train service. We employ no tests, psychological or otherwise to determine fitness, beyond a simple medical examination and an ability to read and write the English language with fair proficiency and to do simple problems in arithmetic. We depend almost entirely on personal judgment and character study, backed by satisfactory references. Other things being equal we prefer married men or men with family ties. An effort is made, of course, to avoid the floater or transient worker, and to secure men of character, honesty and sobriety.

No man is employed until the work is explained to him in every detail. The unpleasant features, such as the irregular hours, the uncertainties and hardships of "bucking the extra list," the necessity of holding themselves at all times on call, etc., are emphasized and pointed out so that there may be no misunderstanding on these scores. Every effort is made to determine a man's fitness, willingness and ability to carry out the obligations that will be imposed upon him before he is even turned over to the line instructors for training. By this method we are able to eliminate those easily discouraged and to materially reduce the labor turnover.

Preliminary Examination by Superintendent Is Thorough

After the men have passed the preliminary examination they are taken in hand by the superintendent of employment and instructed as to the general policies of the management, special emphasis being placed on this in order that they may start out with the proper viewpoint. Instruction in accident prevention and the preparation of accident reports follows, together with a lecture upon public relations, the importance of courtesy and diplomacy in the handling of passengers, and the necessity of cultivating the good will of the public. In this manner the job is pretty well sold to the new man and he is in a better frame of mind to receive the actual training in the handling of his car which is to follow.

After this preliminary training the men are taken in hand by the chief instructors, who teach them the rudiments of the work. They are then turned over to the line instructors for the actual training on the cars. When it is thought that they have qualified in this respect they are required to pass a general examination as to their fitness. If this is satisfactory they are passed to the probationary list on which they are retained for a further three months. At the conclusion of this period they are again thoroughly quizzed, the examination covering rules, company policy, knowl-

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edge of equipment and requirements of operation. If their first year of service proves satisfactory and indicates that they have profited by their training and experience they are given a certificate of proficiency.

The methods employed have been very successful. In spite of aggravating and hazardous conditions we have been able to show a decided decrease in accidents. Considering only men in training, that is to say, during the probationary period, the decrease is about 70 per cent as compared with former methods, certainly a very creditable showing. Comparing 1927 with the previous year there was a 40 per cent decrease in labor turnover, while for the first four months of 1928 the turnover was less than one-half of that for the corresponding months of 1927.

The work of the instruction department has at all times been accorded the fullest support of all departments of the company and of all of the officials from the management down. Without this it could never be the success that it is. But the outstanding feature of it all has been that the men who actually do the training, having been instrumental in building up the system, feel a personal responsibility for its success, and have gone about the performance of their duties in this connection with a zest and enthusiasm which would otherwise have been lacking.

Correcting Radio Interference*

San Diego Electric Railway has developed methods of locating and correcting troubles reported by broadcast listeners

By G. W. Shaver
Superintendent of Maintenance, San Diego Electric Railway, San Diego, Cal.

Some two years ago complaints were made to the San Diego Electric Railway that its lines were producing severe radio interference. A committee composed of representatives of various civic and technical organizations made an investigation with portable receiving sets to find if the railway really was causing the trouble.

The interference under investigation, generally referred to as the "rock crusher," has no definite period, tone or note. It is something like heavy static and covers the entire broadcasting frequency band, having a maximum at approximately 1,000 kilocycles. The noise appears suddenly and lasts for intervals varying from a few seconds to several minutes. It is reduced in intensity after nightfall. While the interference covers a very wide area, it was much more severe along the trolley line. An increase in the intensity was noted as the portable set used for tests was moved under any wires, although all efforts to connect the noise with movement of individual cars were unsuccessful. It was decided that perhaps the interference noted at a given point was the result of disturbances set up by several cars which might be some distance away. To determine this, tests were made at night when there was only one car on the line. At that time it was noted that the characteristic noise started and stopped in synchronism with the movement of the car with power on the motors. It was also apparent that the air compressor motor caused a continuous roar of mild intensity.

The investigation leads to the belief that commutation of the motors and sparking at the trolley wheel set up highly damped oscillations which are conveyed to the trolley wires. Power and telephone wires pick up this interference by induction and reradiate it. The reduction of this interference after nightfall is probably due to the increased absorbing effect of the comparatively large lighting load of all of the cars, which forms a non-inductive path between trolley and ground.

The next step was to find a remedy. Two solutions presented themselves, one to improve commutation and reduce sparking at the trolley wheel, and the other to prevent the disturbances set up from reaching the trolley wire. Since the commutation was considered very satisfactory it was decided that the disturbances must be prevented from reaching the trolley. A low pass filter was designed, which consisted of a 300-microhenry inductor connected between the car side of the inductor and ground, the theory being to provide a low impedance path for the direct current between trolley and car and at the same time offer a high impedance to the high frequency currents between car and trolley and shunt them off to ground through the condenser.

Tests made on a section of the trolley which could be isolated from the rest of the system showed that the filters eliminated about 80 per cent of the interference. It was observed during this test that when a car without a filter entered this sector it caused severe interference, although the car was at times more than 1½ miles from the observing point.

In a further investigation a car equipped with four Westinghouse 514-A-3 motors was jacked up in the carhouse in such a manner that the motors could be rotated. A single-wire antenna about 40 ft. long, parallel to and about 3 ft. from the trolley, was connected to a six-tube Atwater-Kent radio receiving set. Running one motor at a time, it was observed that No. 1 motor caused severe interference when turning in one direction and practically none when reversed. On the other hand No. 2 motor caused practically no interference when rotated in either direction. The main series field of motor No. 2 is permanently connected between armature and trolley, while the main series field of motor No. 1 is permanently connected between armature and ground, but the commutating field is connected between armature and trolley when the armature revolves in the direction in which no intereference is caused.

As an experiment, the main series field of motor No. 1 was connected between armature and trolley. No. 1 motor then could be rotated in either direction with practically no interference; in fact, it was possible to rotate both motors simultaneously in either direction with practically no interference. It was concluded that in this type of motor either the main series field or commutating field will act as a choke, which prevents the commutator disturbances from reaching the trolley. It is impossible so to connect motors No. 1 and No. 3 with their main series fields between armature and trolley without adding another unit switch, because of the system of tapped field control employed.

Filter Reduces Noise

A new and more efficient filter was built and installed on the car. It was of a type similar to that already described except that it had three stages; that is, three 100-microhenry inductors

*Abstract of a paper presented before the California Electric Railway Association Convention, San Francisco, May 7-8, 1928.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Aug. 16 — **Metropolitan Section, American Electric Railway Association, fourth annual outing, Luna Park, Coney Island, N. Y.**

Aug. 16-17 — **Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.**

Sept. 7 — **Maryland Utilities Association, mid-year meeting, Braddock Hotel, Braddock Heights, Md.**

Sept. 7-8 — **Central Electric Traffic Association, Potawatomi Inn, Angola, Ind.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

Sept. 25 — **Central Electric Railway Master Mechanics' Association, Cleveland, Ohio.**

Oct. 1-5 — **National Safety Council, safety congress, New York, N. Y.**

Oct. 8-12 — **American Welding Society, fall meeting, Philadelphia, Pa.**

Nov. 14-15 — **Public Utilities Association of Virginia, Roanoke, Va.**

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in series with the trolley lead and three 4-microfarad condensers connected respectively between the car end of the inductors and ground. This eliminated practically all noise from the main and compressor motors. It also was found that a large radio frequency choke (all three inductors in series) without any condensers was quite effective, but not as good as when the condensers were used.

It is to be regretted that a device such as described has practically no effect on the disturbance set up by a sparking trolley wheel. It is believed, however, that this is so small a factor that if the interference from the motors is eliminated, that from the trolley wheel will cause little or no trouble.

One effect noted has not as yet been clearly explained. There seems to be a certain amount of interference produced when the power is shut off and the brakes are set hard, though there is little or none while coasting and if the trolley pole is pulled down there is none at all.

The results of our tests indicated that most of the interference caused by an electric street railway could be eliminated by the proper use of a filter. Having reached this conclusion, one was designed for use on the cars, having in mind (1) effectiveness, (2) ruggedness, and (3) cost.

Details of the Filter

This filter consists of one high-frequency choke of approximately 100 microhenrys to be connected directly in the trolley circuit between the trolley base and the car wiring and bus, and a 2-microfarad condenser to be connected between the car side of the choke and the ground. The high-frequency choke consists of 21 turns of 1x0.083-in. copper ribbon wound in pancake form, with an inside diameter of 4 in. and an outside diameter of approximately 18 in. The turns were spaced ¼ in. apart with wood blocks or strip insulation.

Three cars were equipped with filters of this design. After a 90-day endurance run, one was put on special test. The tests, made at night when no other cars were on the line, consisted of comparing the intensity of the interference produced by the car with a filter and one identical to it except that it had no filter. The cars in question were run separately up and down the track past the observing point and for a distance of about two blocks on either side.

At the conclusion of these tests the management deemed it advisable to equip all of the active cars with this filter. We have received many letters from the radio fans thanking us for the work we have done.

Crossing Bells Also Offenders

After minimizing the interference caused by street cars, the next problem was the elimination of interference caused by wig-wag crossing bells. With a little study it was found that the bell itself caused considerable interference during the ringing period, and the contacts for the magnets that operate the moving disk caused little or none. Various types of filters were tried to wipe out this interference caused by the bell. By installing a small choke on either side of the contacts of the bell it was entirely eliminated. These chokes consist of 350 turns of No. 23 D.C.C. wire.

Railway Advertising Discussed

NEW ideas in railway and bus advertising were discussed by H. M. Lytle, W. H. Boyce and Maxwell Benson at the Public Utilities Advertising Association meeting held in connection with the International Advertising Association convention at Detroit, July 8-12. Mr. Benson gave a number of experiences and ideas used by the Nashville Railway & Light Company, of which he is advertising manager. He explained the use of mail circulation and how children may be appealed to for certain types of pleasure riding. He also explained how his company had recently co-operated with the theaters in Nashville in selling street car rides. A coupon was carried in the street car publication which, upon presentation to the theater box office, entitled the holder to a refund of his car fare both ways. The car fare was in the form of two street car tokens, the theater management standing the expense in return for the business they could get through the street car publication.

As a suggestion, Mr. Benson advised the use of car cards for popularizing, by the use of photographs, certain street car operators who had just performed some outstanding service. It would be a good medium for popularizing the individuals who had led in safety, courtesy or length of service, and also get over the idea that all other trainmen are trying for similar excellence.

In order to make motor coach routes better known, a contest is being conducted in Nashville whereby contestants are required to trace these routes onto a blank city map, and show familiarity with certain other details of the coaches and submit a brief essay on the advantages of using them. A number of business concerns along these motor coach routes are tied in with the contest and the company offered $50 to the winner.

In closing, Mr. Benson asked if it was insubordination for advertising men to ask for new equipment upon which to lavish their new ideas. How can a company expect to create new ideas when the company itself hasn't created a new street car in twenty years? Can the public be fooled into believing that it is more comfortable, more convenient, more pleasant to ride a street car that is two score years old, hasn't been washed in a month, and travels with the gyrations of a leaping Lena? Mr. Benson contends that every good advertising man should have the courage to help influence his company toward the purchase of as much new and modern equipment as possible so that he may have at least some substantial support for his sound advertising argument that a street car is much to be preferred to a private automobile.

Much interest was shown in the address by P. H. Gadsden, vice-president United Gas Improvement Company, Philadelphia, on "Great Industries That Advertising Has Built." Mr. Gadsden explained how advertising has been a stimulant to mass production and the important part that advertising has played in obtaining the present high standards of living and wages, and how it is a potent force in an alignment of business standards and practices. Mr. Gadsden emphasized the new competition which is threatening American business, in the form of an effort to inject the federal government into the field of business. He cited the harm that may come from such a situation and appealed to the advertising genius of America to meet and overcome this new competition by the same intelligent and sustained advertising efforts which have proved so successful in meeting each different kind of competition as it arose.

Work of Bureau of Simplified Practice Commended

IN A PAPER entitled "What to Buy, When to Buy, and Obsolete Material," read before the meeting of the California Electric Railway Association at San Francisco on May 7-8, 1928, C. Thorburn, purchasing agent Pacific Electric Railway of Los Angeles, commends the Bureau of Simplified Practices of the Department of Commerce for the results obtained in reducing and standardizing the repair and replacement parts in common use on electric railway properties. Not only does this cut down the number of items which must be kept in stock, but it also greatly simplifies and reduces the paper work necessary to properly keep track of it. Mr. Thorburn urges that the various departments in every company organization profit by this example in reducing the number of forms required in connection with records and accounting practice.

Attention is called in the paper to the prevailing tendency on the part of all users of material to distrust the stores and purchasing departments to the extent of drawing out more material than is actually required and caching it away for future use. To quote Mr. Thorburn: "Every department using material wants to have plenty of it on hand. It is hard to overcome a certain amount of distrust in the ability of the stores department to furnish material when and where wanted. To provide against the possibility of shortage, workmen and foremen alike, if afforded any kind of an opportunity, will draw an excess supply from the store, hiding it away in out-of-the-way places. Withdrawals of this sort beyond immediate requirements must be met by replacement in the stores department. Taking the entire system into consideration it will be seen that this practice soon leads to an over-accumulation, which is expensive even if the material is ultimately used as it suffers a certain amount of depreciation."

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News of the Industry

Home Rule Provision Drawn in Chicago

The home rule provision of the new transit ordinance which they are drafting was agreed upon, on July 31, by the members of the sub-committee of the Chicago City Council committee on local transportation. The provision is, in substance, the same as that contained in one of the Chicago bills which failed of passage in the Legislature last May. It would create a Cook County transit commission, four members of which would be named by the city and one member by the county board of commissioners. This commission would have the entire regulatory power over all electric railway and bus lines within the county and would supersede, in the county, the Illinois Commerce Commission.

The sub-committee desired that the City Council should not be removed from control over the commission, once the committee started to function. Assistant Corporation Counsel John G. Drennan was therefore instructed to insert in the new ordinance clauses strengthening the Council's supervision in this connection.

The sub-committee's meeting, held in the afternoon of July 31, followed a conference held in the morning of the same day with representatives of the Chicago transportation companies. It was in the morning that the Aldermen decided they had no definite program or policy on home rule. They determined to meet in the afternoon to formulate one.

Home rule is one of the four major parts of the transit ordinance to be agreed upon before details are discussed. The other three are consolidation, an amortization plan, and the length the franchise is to run which is to be awarded to the consolidated transportation company. It is expected that the question of the life of the grant will be the most difficult to determine. Some transportation executives insist on an indeterminate permit, but certain Aldermen believe that 30 years is long enough.

According to present plans the ordinance, if approved, will be submitted to a referendum in November. If it is approved, then, the Legislature will be asked next January to enact a bill under which it can be put into effect.

Certificates for First-Aid Courses in Georgia

First-aid certificates have been awarded to 112 members, including officials, of the Georgia Power Company, with headquarters in Atlanta, Ga., during the first six months of 1928. All persons, including two young women who received certificates, have completed the prescribed first-aid instruction courses and passed the necessary examinations. F. W. Hadley, safety director, announced the news.

Newark Project Discussed

Mr. O'Toole elucidates plan for relieving congestion in New Jersey metropolis. Fixes limitation of bus

"I FEEL that the project now before the people involving the Pennsylvania Railroad Station and the Morris Canal development is fraught with a great amount of potential value for our city. The greatest problem facing people today, is traffic. It is a question not peculiar to Newark. It is everywhere. Storekeepers find difficulty in getting people to come to their places of business. Why? Because of traffic. It clogs the streets. In Newark we are choked with traffic on our main business thoroughfares. We are strangled. Our growth is retarded. We are not able to develop as we should. We can't move people through the neck of the bottle as we should in downtown Newark."

Thus did John L. O'Toole, vice-president in charge of public relations of the Public Service Corporation of New Jersey, present this situation in remarks which he made at the recent dinner of the Newark Real Estate Board.

It will be recalled that the project to which Mr. O'Toole referred contemplates among other things a new terminal in Newark and the use of the abandoned canal bed by cars of the Public Service. In the improvement of the Morris Canal bed Mr. O'Toole said Public Service was not asking the city to give it anything. He described the proposed city railway and retold the story of where the trolley cars would enter and leave, location of the stations. He said:

It is a cold-blooded economic proposition. If some one has a better plan and if this plan is no good, all well and good. But if it is feasible and will take Newark out of the class of a two-street city and make it something more than a way station on the Pennsylvania Railroad, and make the city what it is—a real metropolis—what then?

Mr. O'Toole said Public Service had given serious consideration to using the canal bed for buses instead of railway. Figures compiled by the Public Service recently in a check-up of passengers using trolley cars and buses in "a peak" hour of the evening rush were then given in detail. Mr. O'Toole said the streets would not be able to accommodate buses if they were substituted for trolley cars, as there would have to be many more buses than cars to carry the crowds.

In this connection he pointed out the probable number of cars that could use the proposed canal railway to advantage would be 272, providing for approximately 17,700 passengers. If the movement of this number of passengers was restricted to buses it would require a total of 453 bus trips from the Pennsylvania Railroad Station during the maximum hour. This means an average headway of 7½ buses every minute, or a bus every eight seconds. According to Mr. O'Toole it would be possible to dispatch 272 cars from the proposed terminal in an hour, but the handling of 453 buses in a similar period would be out of the question. He was quoted as follows:

The electric cars in Newark are still carrying the bulk of the traffic, the ratio being about seven to four. On the Springfield line, where the number of cars and buses is exactly the same, the cars carried 2,543 passengers and the buses 1,270. In South Orange Avenue, the car line with 41 units carried 2,532 passengers, and the buses with 43 units carried 1,670.

Rehearing Sought in Stockton

The city of Stockton has applied to the California Railroad Commission for a rehearing of its recent order granting an increase in rates to the Stockton Electric Railroad. The commission authorized the company to place in effect a one-way single cash fare of 7 cents between all points on the company's lines, and four tokens for 25 cents, unlimited as to time of use, each entitling the holder to one continuous ride with full transfer privileges. This was an increase over the former 6-cent fare. The commission suggested that the company place certain operating economies in effect and the city urges that this be done before granting the increased rates.

Advance Sought by Eastern Massachusetts Men

Trainmen of the Eastern Massachusetts Street Railway, Boston, were heard recently before the board of arbitration on the questions: Shall the basic wage be changed? Shall the differential to one-man car operators be revived? Shall seniority be established in the mechanical departments? The board consists of James J. Kerwin, Lowell; neutral member; Fred A. Cummings, vice-president of the road, and James H. Vahey, representing the men. Mr. Vahey cited the Boston Elevated scale of wages paid to carmen as contrasted with the similar scale of the Eastern Massachusetts rate. He contended the Eastern Massachusetts could afford to pay a higher wage.

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Mayor Signs I. T. S. Grant

Mayor Victor J. Miller of St. Louis, Mo., on July 31 signed an ordinance granting the Illinois Terminal System a 50-year franchise to haul freight and passenger trains by an elevated, surface and subway from the McKinley Bridge to a new underground terminal to be constructed at Twelfth Boulevard and Lucas Avenue. The electric line does not have the right to haul freight under its existing franchise.

The company plans to erect a large fright building at Twelfth Boulevard and Lucas Avenue and to remodel an existing building at Twelfth and Washington Boulevards as a modern passenger depot.

North Shore Line Sells Air Transport Tickets

Chicago is made the hub of a new rail-air service with completion of arrangements by the Chicago North Shore & Milwaukee Railroad and the National Air Transport, Inc., whereby the North Shore Line becomes the exclusive agent for the sale of tickets in its territory for air transportation from Chicago to any of the cities served by planes of the N.A.T. Under this arrangement through rail-air service is established connecting Milwaukee, Racine and Kenosha, Wis., and Waukegan, Ill., served by the North Shore Line, and Toledo and Cleveland, Ohio; New York City, Moline, Ill., and St. Joseph and Kansas City, Mo., served by National Air Transport.

The Chicago Municipal Airport at Cicero Avenue and West 63rd Street is the point of transfer from rail to air. Passengers from Milwaukee or any of the other cities on the North Shore Line who purchase interline rail and air tickets travel by rail to 63rd Street, Chicago. There they can board a surface line car, which carries them directly to the hangars of the air transportation company. One trip is made each way daily over the eastern and western routes of the N.A.T. Trips between cities on this new air-rail service may be made in either direction.

Fares Increased in Springfield, Ill.

The Illinois Commerce Commission ruled on Aug. 1 to abolish the schedule of fares providing two tokens for 15 cents and eight tickets for 50 cents and to substitute a rate of three tickets for 25 cents on the lines of the Illinois Power Company in Springfield. The single cash fare remains at 10 cents. The commission did not, however, grant the plea of the company to charge a 5-cent fare for children. Instead, it increased the fare for children between the ages of six and twelve from 3 to 4 cents and allowed for a 5-cent fare for school children more than twelve years old. These new rates are to become effective Sept. 1, 1928.

In addition improved operating conditions and service were ordered.

The commission felt that to increase children's fares from 3 to 5 cents would so decrease that class of patronage as to reduce rather than increase the revenue from that class of car users.

In granting the increased rates, the commission declared that it would closely observe progress made by the petitioner to rehabilitate its trackage.

Salt Lake—a City Without Straphangers

Sixty-two men, under direction of Ross W. Harris, Madison, Wis., consulting engineer and traffic expert have been studying Salt Lake's street traffic movement since February, gathering information which will be used by Mr. Harris in working out some of the city's traffic problems. According to the Salt Lake *Tribune*, the indication is that the present signal cycle is too long for the most efficient speed in the movement of traffic. It should be shortened, decreasing the interruption. This would enable motor cars, street cars and pedestrians to move through the congested district faster. Mr. Harris is reported thus:

> At present, the time from green signal to green signal is 68 5/6 seconds. This time could be reduced with advantage. If 20 seconds were allowed for the green signal, four seconds for the amber signal, 20 seconds for the red signal and 4 seconds again for the amber signal, the cycle would be reduced to 48 seconds, which would be a reduction of 20 5/6 seconds.
>
> Under the present arrangement, the average speed of vehicles passing through Main Street and other busy streets is 15.95 m.p.h. With the change, the average speed could be increased to better than 22 m.p.h., which would mean a considerable aggregate saving of time for the users of the streets.

Examining into the parking problems of the central business district included in the area bounded by South Temple, Fourth South, West Temple and Second East streets, Mr. Harris found that the number of automobiles parked in the streets or within the blocks averages 4014. At 2 p. m., the daily average is 4373 and at 5 p. m., the average is 4256. Inquiry was made into the extent of vacant space within blocks, back of buildings, which could be used in parking cars. On this point he said:

> This unused area would provide parking space for 4152 automobiles. There would be another advantage than that of getting motor cars off the streets. The use of vacant space for parking would give buildings better fire protection.
>
> Merchants could offer their customers the use of the space. That idea has been adopted elsewhere. Or parking space could be rented at a nominal rate to automobile owners desiring to use it.

Mr. Harris declared that Salt Lake was remarkable in the number of persons who walk from their homes to the stores in the central district. Observations made by his staff, he said, show that 28 per cent of the shoppers walk to the stores in which they made purchases; 37 per cent rode in automobiles; 34 per cent rode in street cars, and 1 per cent made the trip in miscellaneous conveyances.

He thought that the reason so many Salt Lake shoppers walked to the downtown stores was due to the fact that the residential districts are conveniently located on all sides of the business center, making it easy for pedestrians to come from their homes. He also pointed to the fact that pedestrians, coming from residential districts, were not compelled to pass through such regions, existing in other cities, which persons afoot usually avoid.

Salt Lake is not a "straphanger" city, Mr. Harris found, after studying the city's street car service during the daily rush hours. He said:

> In the evening rush hours there are almost as many seats as passengers. The street cars here provide more seats during the rush hours than are provided for passengers during similar rush periods in other cities.

New San Fernando Line Would Cost $6,380,000

The cost of the proposed rapid transit interurban line from Los Angeles to San Fernando Valley, to which reference was made in the JOURNAL for March 3, has been estimated at $6,280,000 not including 30 bus feeder lines to cost $450,000. While cities in San Fernando Valley favor the proposed system, much opposition has arisen in Hollywood and other parts of Los Angeles where the proposed elevated line would run. Engineers of the Pacific Electric Railway have estimated the cost at slightly less than $6,000,000. The larger figure is the estimate of experts for the San Fernando Valley Association. Running time between Los Angeles and valley points would be cut in half by the new system, which would call for a few short tunnels in addition to the elevated line.

Seeks Postponement of Columbus Freight Issue

The Columbus Railway, Power & Light Company, Columbus, Ohio, has notified the Westerville village officials of its intention to ask the State Public Utilities Commission to postpone until Sept. 18 the hearing on the protest to abandonment of freight service to Westerville, 15 miles from Columbus. Charles C. Marshall, attorney for the company, suggested that it would be unnecessary for any parties desiring to oppose the application to appear at the hearing as the company intends merely to present its petition with proof of its publication and then seek postponement.

Westerville opponents of the railway are attempting to prove that the purpose of the postponement is to frustrate a possible referendum in Westerville at the November election on the bus-street car controversy. These protestants charge that should the railway be permitted to abandon the Westerville freight line, Westerville business men, who in the past have favored the company, would shift their support to the Buckeye Stages, Inc., which has been bargaining for the right.

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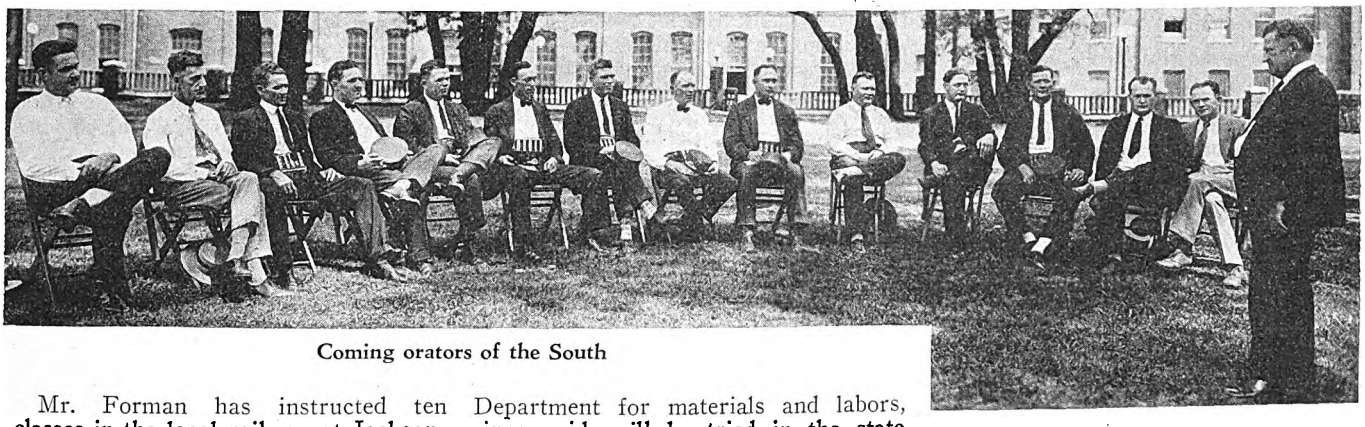
The Orator May Wear a Blue Uniform

The Jacksonville Traction Company, Jacksonville, Fla., has recently instituted a course in public speaking. Employees from every department enrolled under R. C. Forman, who has instructed classes in fourteen other companies under the executive management of Stone & Webster, Inc. Many of the Jacksonville trainmen and men and women connected in other departments have learned to talk capably in public—at least they have demonstrated considerable ability in their trial tests for platform presence and speaking ease.



Coming orators of the South

Mr. Forman has instructed ten classes in the local railway at Jacksonville, teaching the theories and fundamental principles by lectures and impressing them upon his pupils by actual practice. Mr. Forman is being relieved by Roy Minor, storekeeper for the company.

The public speaking classes have brought a new interest and diversion to many of the company's employees and have unearthed a considerable amount of oratorical talent, according to John P. Ingle, manager at Jacksonville, who said recently:

Many of our employees were astonished and gratified when they found that they could, with ease and force, address audiences. The instruction has been valuable to the company from a standpoint of improved spirit and awakened interest, but it has been infinitely more valuable to the individuals themselves. The confidence inspired and the ambition kindled by Mr. Forman's work may mark a turning point in several lives. When men and women become aware of powers they didn't suspect they possessed, they are likely to turn that knowledge to advantage.

Mr. Forman himself is delighted with the quick response of his Jacksonville classes. The keen interest and the earnest efforts of his classes to assimilate his teachings have been inspiring, the speaking instructor said.

Each of the classes is instructed in detail in theoretical phases of the work, and then put through easy stages to a point where speaking to an audience presents little difficulty. The students individually address the class bodies until confidence and poise are established. Officials of the company make brief talks before the classes.

"Don't be surprised," Mr. Ingle warned, "if some day in the near future the president of your club announces a name that is unfamiliar, unknown even to local fame, that has no ring of authority, and if a chap in a blue uniform takes the stand immediately thereafter to give you an insight into public service that you have never heretofore had."

State Courts to Hear Von Herberg Suit

The J. G. Von Herberg suit against the city of Seattle, Wash., initially instituted as the result of his purchase of approximately $125,000 in warrants of the Seattle Municipal Street Railway Department for materials and labors, since paid, will be tried in the state courts. The United States Court of Appeals at San Francisco said it had no jurisdiction. The railway department contended that further litigation will postpone needed betterments of the system.

The suit by Mr. Von Herberg was started in the Superior Court of King County. The Puget Sound Power & Light Company, drawn into the suit by the city, asked for removal of the suit to the Federal Court, and this was granted. Mr. Von Herberg appealed from the decision of the United States District Court at Seattle that the federal court had jurisdiction. During her term in office, Mayor Bertha K. Landes importuned Mr. Von Herberg to drop the litigation, contending that it was injuring the credit of the street railway department in the bond market. Although money was borrowed by the department from the city light and water departments, with which it paid the warrant Mr. Von Herberg had purchased, he has continued to seek a determination of the question of priority of operating warrants over funded debt obligations.

North Shore Accident Record Improved

In the annual report of the safety engineer of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., it is shown that the total number of employee accidents during the past year was reduced 11 per cent over 1926. There was a decrease of 12 per cent in the number of lost-time accidents, while the number of days lost because of disability was 28 per cent less than in the previous year.

Restrains Ohio Company

The village of Lowellville, Ohio, was granted a permanent injunction effective on Sept. 14, restraining the East End Traction Company from operating through that village. If the injunction goes into effect interurban cars between Newcastle, Pa., and Youngstown, Ohio, will be affected. The company's franchise expired in 1925. Contending that it was losing money the company sought to substitute hourly service for half-hour service. Residents of Lowellville urged their representatives to refuse to renew the franchise on that basis.

Seven Cents in Effect in Harrisburg

Patrons of the Harrisburg Railways, Harrisburg, Pa., started paying 7-cent fares on July 17 in all zones. The 30-day period of notice ended on that day without a formal protest to the commission. Fares to Hummelstown, Middletown and Linglestown are now 21 cents, in place of 18. Rockville and Oberlin rates are 14 cents. All other points may be reached on a 7-cent fare.

Since its organization the railway system of Harrisburg has increased fares only once, in 1918 when the 5-cent rate was advanced to 6 cents. The filing of the new tariff with the commission was referred to in ELECTRIC RAILWAY JOURNAL, issue of June 23, 1928, page 1044.

Accommodating the Summer Rider

Painting the ends of its trolley cars white is a recent advertising move of the Boston & Worcester Street Railway operating between Boston and Worcester, Mass. Officials say that the white coat of paint will attract riders and in giving the cars greater visibility will lower the possibility of accident.

The company has returned to the open car for the summer for the first time in four years. At present about half the cars running between Boston and Worcester are of the open type. The cars were remodeled from the old open cars, the running boards being removed and grating placed along the sides so that advantage could be taken of the front entrance feature.

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Safety Poster Contest in Pittsburgh

Several thousand replies were turned in to the Pittsburgh Railways, Pittsburgh, Pa., in the recent safety poster contest, and twenty winners were awarded weekly passes. The contest called for a fitting title for a brilliant poster depicting a mother at a telephone and looking out of the window at an ambulance. The judges were all men actively engaged in safety work. Included in the titles were "The Toll Call" and "Beyond Recall." The purpose of the poster contest was to arouse individual interest in the campaign to save human life.

Fare Issue Argued in Los Angeles

Whether Los Angeles street-car patrons may continue to pay the present 5-cent fare or will be required to pay slightly more than 6 cents for tokens for one passage was the question placed on July 24 before the presiding United States Circuit Judge of San Francisco.

The arguments of counsel for the Los Angeles Railway and the State Railroad Commission, with the city of Los Angeles as intervener, were heard by three federal judges, Judge Hunt and United States District Judges Sawtelle and James. After extensive arguments, counsel rested with the privilege of submitting briefs and written argument within fourteen days.

Paul R. Watkins and Woodward M. Taylor of the firm of Gibson, Dun & Crutcher, representing the railway, said the company seeks interlocutory injunctive relief. Mr. Watkins said the order of the State Railroad Commission in denying an increase in fares and fixing the basis of the physical valuation of the company property at $42,000,000 is confiscatory. He said the company is losing $7,000 a day. He related that the late Henry E. Huntington had opposed a fare increase for patriotic and civic reasons, and hoped that another plan might be devised by which the company could be put on a paying basis. He said that various plans were proposed to bring the company out of its difficulties, but all were found not to be feasible.

The railway counsel said the basis of $42,000,000 gives the company a net profit of only 4.9 per cent on the investment, whereas if the basis were lower the company might benefit. Because of this, it was stated by counsel, the company's constitutional rights are being invaded.

Carl I. Wheat, counsel for the Railroad Commission, argued that the federal court has no jurisdiction in the matter. Assistant City Attorney Taylor, representing the city of Los Angeles, stated that, in effect, all of the various franchises granted the company are contracts and that their terms must be observed by either party except by permission of the Railroad Commission to do otherwise.

When the matter was submitted to the court, Mr. Watkins stated that he would like to see a table worked out by which the company could make 8 per cent on its investment. The court did not state when its decision would be rendered.

West Penn Employees Enter New Contest

Another prize essay competition has been announced in *West Penn Life*, the official paper of the employees of the West Penn Railways System. This time a prize of five shares of American Water Works & Electric Company, Inc., common stock is being offered for the best essay on the question, "How Does the Public Benefit from the Form of Group Management of the 'American Company'?"

The contest opened on July 15 and will close on Sept. 15. It is asked that every employee give the question of competing in the contest due consideration. A second and a third prize, consisting of two shares and one share of common stock respectively are offered. The rules of eligibility limit the essays to 1,000 words and require that the contestant's name be attached on a separate slip of paper.

In addition Monongahela System employees have been appraised of monthly awards of $5 for suggestions that are accepted where they effect better service to customer or economy in operation and $1 for suggestions accepted which provide improvements to property or safer operation but do not effect better service. In addition quarterly prizes and yearly prizes are to be awarded. First and second prizes are to be made in the nature of banners to be presented each Fall for "beautifying the property." Judges will inspect all property and proper ceremonies will be held.

Big Day in Connecticut Is Saturday

SATURDAY is the best day in the week for street car and motor bus travel and Sunday the worst, according to the records of the Connecticut Company. This situation obtains the year round, although, during the summer, the travel on Sundays, increases over that during the winter due to the riding to and from the shore and amusement resorts. The heavier traffic on Saturdays undoubtedly occurs by reason of the Saturday half holidays which give more opportunities for travel, for shopping and amusement purposes.

More than half of the entire number of passengers carried by the Connecticut Company each day ride between the hours of 6:30 and 8:30 a.m. and 4:30 and 6:30 p.m., and during these periods the company must furnish more than double the equipment used during the other hours of the day.

Politics Raises Its Head in Omaha

United States Senator Howell has demanded of the Council that before the formal passage of the new franchise ordinance in favor of the Omaha & Council Bluffs Street Railway the measure be amended so as to provide that as a consideration for the granting of a new franchise the company shall agree to sell its bridge connecting its two properties across the Missouri River at not more than $1,500,000. This is a toll bridge for vehicles and pedestrians.

President Shannahan says that negotiations of this character at this time would delay the submission of the ordinance beyond the election date. He said the company was willing to negotiate for making the bridge a one-toll structure or selling it, but not until after a franchise had been granted. Indications are that the Senator will find little support for his proposal, as the community leaders feel that his advocacy of municipal ownership is at the price of disrupting service.

Views on Cleveland Subway Aired at Meeting

The utilities committee of the City Council of Cleveland, Ohio, held its first meeting recently on the proposal made by Raymond T. Cragin, former president of the Cleveland Real Estate Board and promoter of the Cleveland Subway Company, to spend $30,000,000 on subways in Cleveland. Mr. Cragin told the committee that the subway company is ready to start work immediately, with money furnished by the Equitable Trust Company, New York, if the Council will give him a franchise and the Cleveland Railway will agree to operate the subways when completed at a fare sufficient to pay 6 per cent interest and amortization charges on a $30,000,000 bond issue. He took the attitude that he was making a proposition to the city and that it was up to the city to present the proposition officially to the railway.

City Manager William R. Hopkins told the committee the city had a perfect right to contract for a railway service on any basis it saw fit, but that the rub was whether the people would stand for it. Several Councilmen expressed doubt that they would be able to sell people in their districts the idea of paying an additional cent carfare to finance subway construction in a different part of the city. Mr. Cragin's answer to this was that a start had to be made somewhere, that subway operations in the downtown district would decrease operating costs in an amount equivalent to a half cent reduction in car fare; that an amount equivalent to one-third of a cent a ride would accumulate as a surplus out of the proposed 1 cent surcharge and that this surplus could be used at the direction of the city to build other subways.

The committee took no action. At later hearings the attitude of the Cleveland Railway probably will be sounded.

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$1,861,003 Program for Seattle

Extension and reconstruction projects aggregating $1,861,003 are listed in a comprehensive rehabilitation program for the Seattle Municipal Railway, Seattle, Wash., disclosed by Roy E. Furse, acting superintendent of the railway. The projects include improvements in the existing facilities, new lines for which various localities have long been clamoring, reconstruction of existing tracks, installation of special work and paving between tracks. The report was prepared for presentation at the conference of city officials on plans for floating $4,000,000 or $5,000,000 in bonds to finance the work.

Purchase of 200 new one-man cars of the latest type is a feature of the program. Mr. Furse says these cars will soon pay for themselves in reduced operating costs and increased patronage. When the new cars are ready for service the present one-man cars will be used only as trippers.

Other items planned include new track work, at a cost of approximately $350,000; reconstruction projects, include paving between tracks, and reconstructing tracks at an estimated cost of $500,000.

After having been held in abeyance for more than five years because of the Municipal Street Railway System's inability to pay its share of the improvement, a $700,000 repaving project involving the Seattle business district probably will be carried through in the near future. The utilities committee of the Council has recommended that the work proceed since it has been indicated that contractors are now willing to accept street railway bonds for the railway system's share of the cost.

Buses in Alameda

The Key System Transit Company has asked the California Railroad Commission for permission to abandon all street car lines in the city of Alameda, Cal., with the exception of one line, No. 9, crossing the Park Street Bridge and running through Santa Clara Avenue. Bus service will replace the present car lines. The application will come up before Railroad Commissioner DeCoto, at a hearing that has been called for Aug. 14, to determine the routing of bus lines which the commission would authorize to replace street cars through the new tube under the estuary linking Alameda and Oakland.

Alfred J. Lundberg, president of the Key System Transit Company, said that even though the bus applications receive favorable action from the commission it is the intention of the company to ask the Alameda City Council for a revokable permit for the continuance of the Santa Clara Avenue car line from Webster Street to Park Street as an insurance against unforeseen contingencies in the estuary tube and also a guarantee of adequate transportation until such time as the company has sufficient experience behind it in caring for peak loads to the beaches by bus operation.

Cars and Cars

Discussion has turned lately to the question of the best method of opening street car and railway car windows. The proposals have varied from the advocacy of crowbars and dynamite to a counsel of dull dispair. The pessimist, figuring that the job is hopeless, has given up. His attitude is that you can't get a street car or a Pullman window open, and there's no need to try. Sometimes, by the use of a 25-cent piece bestowed on a practically athletic porter, a railroad coach window can be opened or closed. The undertaking is, in general, too serious and difficult to be worth the ambition. In the vote on the car window, the pessimists have it. But comments the Dayton *Journal:*

Meanwhile, in the United States there are running hither and thither something like 20,000,000 "cars" with windows which can be and are manipulated with ease by the weakest woman and the slightest child. A simple turn of a crank and the window in your automobile slips up or down. With a minimum of trouble, the air in the closed automobile can be closely controlled.

The automobile business is intensely competitive, with success dependent upon furnishing the purchasers of cars the utmost in comfort and doing it first. The first windows in the automobile sedan were as hard to manipulate as the windows in a railroad coach or street car. In their search for new attractions, the body builders thought of the windlass principle for their windows, and the automobile window is no problem at all.

The first automobiles were built high like buggies and street cars and Pullmans. They were built with hard cushions and high, straight-backed seats. In the competition for comfort between automobile makers the greater riding ease of the low-slung car was shortly discovered. Immediately, all automobiles began to hug the ground. It was discovered that low seats leaning well back increased comfort, and in this connection the cushion maker got busy. Seat cushions of such luscious yieldingness were designed as no king on a throne had ever dreamed of. Following all this came the "snubber" and a better science of springs, and today even the low-priced automobile has the ease and comfort of a cradle.

During all this time, what have the noncompetitive railroads and street cars been doing? For the most part, their patrons are riding on the same plush, and pitched at the same angle, and in cars of the same high altitude and wide oscillation which prevailed when the automobile was born. In street cars, the hard wooden or rattan seat is still in vogue. And neither railroad nor street car has bothered itself to invent and install a window that anybody but a giant with a crowbar can be sure of opening.

The street car business has been in hard lines since the war. The railroads have suffered also from automobile competition. We would not be hard on them. But suppose the street car and railroad people had been as progressive as the automobile people in the effort to make their patrons comfortable. Might there not be a different tale to tell?

Boston's Happy Result

IT IS evident that the trustees of the Boston Elevated Railway have been able to accomplish the happy result reflected in the recent statement of earnings at the close of their tenth year largely through the use of funds which may loosely be labelled "items hitherto held in suspense." But that does not reduce the credit due to them, and to Edward Dana, the general manager of the Elevated, for their remarkable work during the past twelve months. Although the company encountered last autumn, winter and spring a shrinkage in the volume of car-riding which cut $600,000 off gross revenue for 1928 as compared with 1927, the road was so prudently managed that $700,000 was saved in the expense account.

So the first ten years of the public control have come to a highly creditable conclusion. Only in the first year, under the 7 and the 8-cent fares, was a deficit incurred, and the loan of $3,980,157 then assessed against the cities and towns has now been drawn down to $1,349,333. In addition, nearly twice as much money is now annually paid out for labor as was paid before 1918, the stockholders have had their fixed schedule of dividends, and the car-riders have had the benefit of immensely improved rolling stock.—Boston *Transcript.*

Terminal Electrification Measure Proposed in Atlanta

Electrification of all railroads operating in the downtown section of Atlanta, Ga., is proposed in an ordinance drawn up by the bridge committe of the City Council.

The ordinance, if passed, will go into effect on Jan. 1, 1929. It states in its preamble that smoke and soot from the locomotives employed are injurious to health, to the stocks of merchants, to buildings in the vicinity of the railroad lines, and particularly to the bridges and viaducts over the railroad tracks, which must be frequently replaced because of corrosion resulting from the smoke menace.

The ordinance would make it unlawful after Jan. 1, 1929, for any locomotive to use bituminous coal within the city limits, or to "throw out from its stack any soot, smoke or cinders," or for the railroads operating in city limits to use any other than electric power for the hauling of passenger trains or freight trains.

Twenty-two out of 36 members of the City Council have signed the proposal as "favorable," which is considered to insure passage of the measure when it comes to a vote.

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Recent Bus Developments

Bus Service Reported Satisfactory

Buses are being operated by the Evansville & Ohio Valley Railway on regular schedule between Evansville and Mount Vernon. Some months ago the company discontinued its railway service between Evansville and Henderson, Ky., and buses were installed and the company reports that the revenues from the buses have been quite satisfactory. The company continues to operate its railway line between Evansville and Grandview, Ind., but the operation of gasoline boats between Rockport and Owensboro, Ky., by the company has been discontinued and buses now are being operated between these two points to connect with the railway cars at Rockport.

Workmen of the railway have started the work of removing the company's tracks between Evansville, Ind., and Mount Vernon, Ind., following the installation of the new bus passenger service. The rails on this line were laid in June, 1905. Land comprising the right-of-way will be disposed of in various ways. Land that was secured by condemnation proceedings will in all probability revert to the original owners or their heirs. Land that was purchased outright will, of course, remain the property of the company.

New Service in Iowa

Interurban railway service between Cedar Rapids and Lisbon, over a route of about 17 miles, will be replaced with motor coach service operated by the Cedar Rapids & Iowa City Railway. This company discontinued the railway service on July 27 and will eventually remove 12 miles of this track. In addition to the new bus service the company is also operating a freight motor truck line to handle business which was handled in l.c.l. shipments by the railway. There has been no change of service nor is any contemplated on the company's railway line between Cedar Rapids and Iowa City.

Competition Threatens in Indiana

Arthur W. Brady, receiver for the Union Traction Company of Indiana, recently appeared before a representative of the Indiana Public Service Commission in Muncie and intimated that the company might petition for abandonment of its lines in Randolph County if the petition of the Greenville Transportation Company, seeking to establish intra-state bus service from Union City to Winchester, Ind., is granted.

In 1926 a similar petition to the commission was refused. At that time, however, it was sought to operate the bus line along a state road parallel to the railway. The bus company in its present petition seeks to operate over another state road which will be from a mile to 2 miles south of the railway.

The petition is opposed by the railway on grounds that adequate service is being maintained now by the company. According to Mr. Brady, the company is operating at a loss and if competition is increased the prospects are that the loss will become so great that the company will be compelled to abandon the line entirely.

Long Beach Service for Exposition

The Pacific Electric Railway has been granted a certificate of public convenience and necessity by the California Railroad Commission to operate auto stage service in the city of Long Beach temporarily during the period July 27 to Sept. 4, inclusive. This service is for the Pacific Southwest Exposition.

Hearings in New York Ended

Hearings on the application of the Equitable Coach Company for certificates of convenience and necessity to operate buses in Manhattan, Brooklyn and Queens were officially closed by the New York Transit Commission on Aug. 2 and attorneys of the company and of the Brooklyn-Manhattan Transit Company, New York Railways, New York & Harlem Railway and the Manhattan & Queens Traction Company, the four opposing railways, were ordered to submit briefs before Sept. 15. Meanwhile, however, the bus company must prove its financial responsibility to the commission.

Would Run Buses on Pennsylvania Line

The Lewisburg, Milton & Watsontown Passenger Railway, Harrisburg, Pa., has applied to the Public Service Commission for permission to abandon its line and substitute buses along the same route under the name of the West Branch Transit Company, most of whose stock is held by the electric railway. No protests were offered against the application.

No Bus-Trolley Competition on Buffalo Line

No opposition to the application of the International Railway, Buffalo, N. Y., for permission to abandon part of its Parkside-Kenmore line developed at the hearing before the Public Service Commission. Municipal authorities of the village of Kenmore appeared in favor of the plan. With the abandonment of its single track line in Kenmore Avenue from Virgil Avenue to Delaware Avenue, the International Railway now is constructing a loop at the Virgil Avenue city line of Buffalo. The Delaware Avenue bus will hereafter handle passenger traffic from the suburban village of Kenmore so there will be no bus-trolley competition on this route.

Intercompany Transaction in Newark

The Public Service Co-ordinated Transport, Newark, N. J., has been authorized by the Board of Public Utility Commissioners to issue $10,000,000 of two-year 6 per cent notes to the Public Service Corporation of New Jersey as evidence of advances of funds used in the purchase of bus equipment.

Another Suburban Bus Line at Worcester

Service by bus is now being maintained by the Worcester Consolidated Street Railway, Worcester, Mass., to Morningdale and Boylston. The railway line has been discontinued at the city line. Buses have gradually replaced most of the suburban trolley lines of the company, so that now the only ones remaining are the lines to West Auburn, North Grafton, Shrewsbury and Millbury.

Railways Capitalize on Zero Hour for Washington Buses

Following the heavy inroads into their traffic by buses operating over public highways, electric railway lines connecting Washington, D. C., with adjoining Virginian suburbs are getting back a large part of their patronage as the result of derangement of bus schedules due to road repairs. Both the Washington & Old Dominion and the Washington & Virginia Railways are putting on additional equipment and everything possible will be done to induce this patronage to remain permanent.

The bus lines sought to prevent the closing of the road, which is one of the principal arteries leading out of Washington, by means of an injunction restraining the state highway department from such action. The injunction, though obtained, was finally revoked by the justice who gave it. This opened the way for the highway department to blow up a bridge that is to be replaced. Highway officials believe that, inasmuch as the road is to be widened as quickly as possible, the work can be pushed more advantageously if the entire road is closed, rather than leaving alternate sides open for traffic. This attitude on the part of state officials was due principally to the fact that the existing electric railways operating over their own rights-of-way, would be able to serve the communities affected.

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Financial *and* Corporate

Concluding Moves in Indianapolis-Cincinnati Deal

Control of the Indianapolis & Cincinnati Traction Company, Rushville, Ind., officially passed on July 27 from the receiver into the hands of Cincinnati and Toledo interests. The reorganization of the company, to be known as the Indianapolis & Southeastern Railroad, will be completed in a short time. C. T. DeHore, Cincinnati, is president of the company and also head of the Southeastern Indiana Power Company, an allied company which will sell electricity to the railway and to 28 communities served by the railway.

Mr. DeHore has announced that the main offices of the company will remain in Indianapolis. The new company has purchased ten new interurban cars of the one-man type to replace the large, heavy cars now in service. The company operates two interurban lines, one from Indianapolis to Greensburg and one from Indianapolis to Connersville. It is expected that the Indianapolis & Southeastern Railroad shortly will offer for public subscription an issue of $600,000 of 6 per cent preferred stock. The lines were constructed more than 25 years ago through the efforts of the late Charles Henry.

The company has been operating into Indianapolis over the lines of the Indianapolis Street Railway, but this right was denied the successor company on July 28, apparently because of an oversight in the negotiations connected with the work of winding up the affairs of the old company. In consequence a temporary bus service was installed to bring people into the city who used the interurban, but it is expected that this condition will soon be corrected.

Final Accounting for Massachusetts Road

Walter L. Adams, receiver for the Milford & Uxbridge Street Railway, Milford, Mass., has filed in the Supreme Court a report in which he states that for the quarter ended June 30, 1928, he had cash on hand totaling $165,205 designated as follows:

American Trust Company, received from the sale of the property plus interest, $87,630; American Trust Company, sale of the Holliston carhouse plus interest, $1,117; Old Colony Trust Company, sale of the Holliston carhouse plus interest, $32,642; Home National Bank, certificates of deposit $38,121; Home National Bank, received from the sale of Hopkinton rail and wire plus interest, $3,529; Home National Bank, checking account $2,163.

During the period of the receivership from Aug. 4, 1926, to May 3, 1928, inclusive, the total receipts were $306,129 and the total expense $287,182, leaving a balance of $18,947.

Mr. Adams reports that the road ceased to operate on May 3 when he deeded the property to the purchasers, the Citron-Byer Company, but that on May 4 the road was taken over by a new company, the Milford, Framingham, Hopedale & Uxbridge Street Railway, as the successor of the Citron-Byer Company. All bills contracted since the receivership have been paid except a bill of Professor Charles B. Breed for making a report on the condition and value of the property and apportioning of the lines between the two mortgages. Professor Breed has been paid in part but there may be a little more work to do.

Industrial Conditions Affect Operation in Beaver Valley

Gross revenues from railway operations of the Beaver Valley Traction Lines, New Brighton, Pa., were $552,950 in 1927, compared with $597,038 in 1926. The net deficit in 1927 was $9,325, compared with $8,044 in 1926. Passengers carried in 1927 numbered 11,424,960 against 11,984,996 in 1926. These figures do not include passengers carried free. The railway business was affected not only by the depression in many lines of industry with consequent unemployment, but also because of the continued abnormal situation in the coal mining industry. This was the explanation contained in the annual report of the Philadelphia Company, the parent company.

Bonds of the railway system in the principal amount of $486,000 were retired during the year from funds available with trustees derived from sales of property. Street railway expenditures were confined largely to improvements in track and roadway.

The Beaver Valley Motor Coach Company, the bus subsidiary, suffered a deficit of $10,725 for the year against a deficit of $4,654 in 1926. The number of bus passengers in 1927 was 1,176,900, compared with 1,084,811 in 1926.

CONSOLIDATED INCOME AND PROFIT AND LOSS OF THE BEAVER VALLEY TRACTION COMPANY AND PITTSBURGH & BEAVER STREET RAILWAY YEAR ENDED DEC. 31, 1927

(With Transactions between Companies Eliminated)

Gross revenue from street railway operations		$552,950
Operating expenses:		
Maintenance of way and structures	$56,656	
Maintenance of equipment	36,265	
Traffic	4,725	
Power	70,536	
Transportation	150,399	
General administrative	47,637	
Other general	42,302	
Taxes	10,404	418,929
Net revenue from street railway operations		$134,021
Auxiliary operations:		
Operating revenues	$13,956	
Operating expenses	14,620	
Net loss from auxiliary operations		664
Net revenue from operations		$133,357
Non-operating revenues:		
Rental of real estate and buildings	$820	
Interest from investment securities	435	
Interest from other sources	1,273	
Miscellaneous	541	
Total	$3,070	
Non-operating expenses	501	
Net revenue from other operations		2,569
Gross income		$135,926
Income charges:		
Interest on funded debt	$100,350	
Interest on unfunded debt	32,892	
Miscellaneous	179	
Total	$133,422	
Less interest charged to construction	3,386	130,035
Net income before appropriations		$5,890
Appropriations:		
Retirement (depreciation) reserve	$13,911	
Amortization of debt discount and expense	1,304	15,216
Net deficit for the year		$9,325
Deficit, Jan. 1, 1927		523,721
Other charges—Miscellaneous (net)		72,053
Deficit, Dec. 31, 1927—Per balance sheet		$605,101

SUMMARY OF INCOME AND PROFIT AND LOSS ACCOUNTS OF THE BEAVER VALLEY MOTOR COACH COMPANY FOR THE YEAR ENDED DEC. 31, 1927

Operating revenues		$107,778
Operating expenses:		
Maintenance of equipment	$23,635	
Traffic	393	
Transportation	52,099	
General administrative	6,589	
Other general	9,031	
Taxes	4,278	$96,027
Net revenue from operations		$11,751
Non-operating revenue—interest		49
Gross income		$11,800
Income charges:		
Interest on unfunded debt	$3,822	
Less interest charged to construction	165	$3,656
Net income before appropriation		$8,144
Appropriation for retirement (depreciation) reserve		18,869
Deficit for the year		$10,725
Deficit, Jan. 1, 1927		7,613
Miscellaneous debits (net)		1,690
Deficit, Dec. 31, 1927—Per balance sheet		$20,028

STATISTICS OF BEAVER VALLEY MOTOR COACH COMPANY

Routes operated	3
Route-miles operated (single way)	8.4
Coaches owned	12
Revenue coach-miles operated*	369,269
Passengers carried	1,176,900
Passenger revenue per revenue coach mile, cents‡	29.01
Average fare per revenue passenger, cents	8.37

*Includes special coach mileage.
‡Includes special coach revenue and mileage.

STATISTICS OF THE BEAVER VALLEY TRACTION COMPANY AND THE PITTSBURGH & BEAVER STREET RAILWAY

Miles of road		25.30
Miles of track		41.62
Cars:		
Passenger	34	
Miscellaneous	7	41
Car-miles operated		1,531,161
Car-hours operated		149,422
Passengers carried:		
Revenue	10,902,366	
Transfer	522,594	
Free	4,135	11,429,095
Passenger revenue per revenue car-mile, cents		35.66
Passenger revenue per passenger carried, cents		4.77

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Large Pennsylvania Merger Consummated

The East Penn Traction Company, which is a part of the East Penn Electric Company, serving a large portion of Pennsylvania, became a part of the extensive Pennsylvania Power & Light Company property on July 24. Announcement of the change was made by William H. Evans, manager of railways of the East Penn Electric Company. He will remain in that capacity, as will the remainder of the personnel.

The other officers, however, have been changed. They will be as follows: President, P. B. Sawyer, Allentown; vice-presidents, H. F. Dicke and E. W. Hill, Allentown; secretary, C. M. Walter, Allentown; assistant secretaries, H. L. Martin, L. K. Bingaman, S. M. Sweitzer, F. T. Carter, W. M. Brooks and E. P. Summerson, Allentown, and W. H. Evans, Pottsville; treasurer, C. M. Walters, Allentown; assistant treasurers, A. C. Ray, Alex Simpson, L. K. Bingaman, S. M. Sweitzer, F. T. Carter and W. M. Brooks, Allentown; auditor, W. L. Davis, Allentown; solicitor, Otto E. Farquhar, Pottsville.

The merger takes in all the trackage and equipment of the traction company and all subsidiary light and power companies in the Panther Creek Valley and coal regions. These are 35 in number. The cities affected will be Pottsville, Tamaqua, Ashland, Frackville, Minersville, Tremont, Williamstown, Lykens, Coaldale, Lansford, Summit Hill and Nesquehoning.

Lower Gross Income in Stockton

The Tidewater Southern Railway, Stockton, Cal., reports to the Railroad Commission its 1927 operating revenue at $332,229, compared with $316,030 for 1926. Operating expenses, excluding taxes for 1927, are $228,839, and $198,372 in 1926, leaving a net operating revenue of $103,390 for 1927, and $117,657 for 1926. During 1927 taxes charged to operation amounted to $30,696 and for 1926 to $24,306. Deducting the taxes leaves operating income of $72,694 for 1927, and $93,351 for 1926. Adding to the operating income, the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income, which represents the amount available for fixed charges, non-operating expenses, dividends and surplus of $75,923 for 1927, and $95,483 for the year previous.

Would Abandon Line in New York

An application was made by the New York State Railways to the Public Service Commission for consent to the abandonment of a portion of its route known as the Rochester & Sodus Bay Railway. The petitioner states that this 34-mile route, lying in the towns of Irondequoit, Penfield, Webster, Williamson, Ontario and Sodus is no longer necessary; that operations on this line have shown a constantly increasing deficit due to the automobile. The operating loss has increased from approximately $14,000 in 1922 to more than $47,000 in 1927. The total number of highway grade crossings on the line is approximately 57. Accidents are said to be frequent. The petition says that during the last five years a large number of serious accidents have occurred on this line.

Some Recent Income Statements

Figures of widely scattered companies reflect economic and industrial conditions in territories served

DECREASES in the net income for June and for the first half of 1928 as compared with the corresponding periods of last year are reported by the United Railways & Electric Company, Baltimore. The decrease in the net for June was $11,711 and that for the first six months reached $117,805. There was an increase of about 1½ per cent in the passenger revenue during June, but increases in wages and other operating expenses more than over-balanced this increase. During most of the six-month period the increased fare of 8⅓ cents was in effect. During the first half of 1927 the fare was 7½ cents.

STATEMENT OF EARNINGS AT BALTIMORE FOR SIX MONTHS

	1928	Increase
Passenger revenue	$8,117,353	†$5,692
Other revenue	106,714	†7,786
Totals	$8,224,067	†$13,479
Operating expenses—		
Way and structures	$471,568	$34,746
Equipment	482,085	22,524
Power	736,099	24,834
Conducting transportation	2,621,143	17,867
Traffic	43,631	4,359
General and miscellaneous	813,448	45,137
Trans. for investment—Cr.	*4,307	4,793
Totals	$5,163,669	$154,264
Depreciation	411,203	†673
Totals	$5,574,873	$153,590
Net operating revenue	$2,649,194	†$167,069
Taxes	789,127	†38,913
Operating income	$1,860,067	†$128,155
Non-operating income	73,273	†12,988
Gross income	$1,933,340	†$141,144
Fixed charges	1,423,666	†23,339
Remainder	$509,674	†$117,805
Interest on income bonds	280,000	.....
Net income	$229,674	†$117,805

*Credit. †Decrease.

Note—Change in rates of fare, effective at midnight on Feb. 12, 1928, from 8 cents cash, with a 7¼-cent ticket rate for adults and 4 cents for children to 9 cents cash, with an 8¼-cent ticket rate for adults and 5 cents for children. No change in commutation or school ticket rates.

For the month of February revenues and expenses were for 29 days in 1928 as compared with 28 days in 1927. Expenses for 1928 are at increased wage over 1927, 2 per cent effective Jan. 1 and additional 2 per cent effective Feb. 12.

STATEMENT OF NET INCOME AT BALTIMORE BY MONTHS

	1928	Decrease
January	$18,367	$53,761
February	18,769	8,823
March	63,256	15,254
April	57,535	23,465
May	61,738	1,791
June	30,009	11,711
Totals	$229,674	$117,805

An increase of $12,247 in the earnings for the first six months of this year, compared with a similar period last year, is shown in the report rendered recently by the United Electric Railways, Providence, R. I. Both the operating revenue and the operating expenses for the first six months in 1928 showed a drop in comparison with a similar period in 1927. The net operating revenue for the 1928 period was $782,159. A net income of $288,608 was shown, an increase of 4.43 per cent over 1927.

The International Railway, Buffalo, N. Y., reports for the six months ended June 30 as follows:

	1928	1927
Operating revenue	$5,538,871	$5,423,725
Operation and taxes	4,637,947	4,901,174
Operating income	$900,924	$522,550
Non-operating	39,788	26,414
	$940,712	$548,964
Fixed charges	700,681	725,236
Net income	$240,031	*$176,271*

An amortization charge of $167,879 is included in the 1927 Buffalo statement. With approval of Public Service Commission this charge has been discontinued effective Jan. 1, 1928 and is therefore not included in the 1928 statement.

Gross earnings of the Market Street Railway, San Francisco, Cal., for the twelve months ended on June 30 were $9,858,135, against $9,875,516 in the previous year. Net earnings, including other income, and before provision for retirements, amounted to $1,515,380 against $1,835,986 in the previous year.

The Eastern Massachusetts Street Railway, Boston, Mass., reports June net income of $51,642 after depreciation and other charges, against $32,088 in June, 1927. The net income for first six months of 1928 was $542,647, compared with $465,209 in first half of 1927.

Net earnings of the Capital Traction Company, Washington, D. C., for the first six months in 1928, were $360,552, while net income for the first six months in 1927 was $390,034.

The Key System Transit Company, Oakland, Cal., reports for the six months ended June 30, 1928, net loss of $350,975 after charges against $204,872 in the similar period of 1927. The net loss for the month of June was $86,785 compared with $64,866 in June, 1927.

The Philadelphia Rapid Transit Company, Philadelphia, Pa., reports for six months ended June 30 surplus of $30,589 after fixed charges, dividends and

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management fees, against $29,846 in first six months of 1927. The surplus for the June quarter was $15,618 after above charges, against $14,971 in preceding quarter and $14,342 in second quarter of previous year.

For the first half of 1928 operating revenue of the Denver Tramway, Denver, Col., was only $2,142,945 compared with $2,189,367, in the corresponding period of 1927. With 104,412 shares of preferred stock outstanding, second quarter earnings were $1.20 a share, while in the first quarter it was $1.12. The increment is attributed to a further reduction in operating expenses. A tabulated statement of the Denver Tramway and the Denver & Intermountain Railroad (the tramway's electrical freight railroad) with intercompany transactions eliminated for the first six months of 1928 follows:

Total operating revenue	$2,142,945
Less operating expenses and taxes—	
Operating expenses, including depreciation	1,417,089
Taxes	253,480
Total operating expenses and taxes	$1,670,569
Net operating income	$472,376
Total miscellaneous income	18,939
Gross income less operating expenses and taxes	$491,315
Deductions from Income—	
Interest on underlying bonds	$95,050
Balance	$396,265
Interest on general and refunding bonds	161,050
Balance	$235,215
Net profit and loss credit less amortization of discount on funded debt	6,993
Balance available for dividend requirements on 104,412 shares of preferred stock	$242,209

The Pacific Electric Railway, Los Angeles, Cal., reports a June operating deficit of $119,662, after expenses and taxes, and an operating deficit of $761,718 for the first half of 1928.

Hearing on Condemnation of Philadelphia Underliers

J. R. Morgan, counsel for the Thirteenth & Fifteenth Streets Passenger Railway Company, one of the underlying companies of the Philadelphia Rapid Transit Company, announced at the continued hearing before the Public Service Commission that his company would seek a court order to restrain the Mackey Administration from proceeding with its plan to condemn the underliers' holdings.

That declaration followed the commission's ruling at the outset of the hearing refusing the underliers' motion for dismissal of the city's petition for an appraisal of the underliers' holdings as an initial step toward ultimate purchase.

The case for both the city and the underliers has now been closed, but two weeks' respite has been allowed for opposing counsel to submit briefs and additional exhibits.

Owen J. Roberts, council for the largest group of underliers, took exception to the method employed by the commission's accountants in appraising the value of the underlier's stocks. He argued that the evaluation should be based on the price of the stock between 1896 and 1927, whereas the commission's experts computed the average price between 1917 and 1927.

$852,137 Carried Forward on Porto Rico Surplus

Net income from operations of the Porto Rico Railways Company, Ltd., San Juan, P. R., for the year ended Dec. 31, 1927, after providing for depreciation, was $407,685. This was disclosed in the annual report of the directors submitted at the 21st annual meeting of shareholders.

Interest on first mortgage and refunding mortgage bonds for the year absorbed $171,120. An appropriation of $50,000 has been made for United States income tax, including claims still subject to adjustment. After making the foregoing appropriation there remains a profit of $186,564, out of which have been paid dividends on preferred stock amounting to $70,000 and dividends on common stock amounting to $90,000. The balance of $26,564 has been added to surplus account.

There was appropriated from the surplus carried forward from the previous year the sum of $50,000 to provide additional reserve for United States income tax claims pending and $50,000 for additional depreciation applicable to the year 1926. The balance carried forward in surplus account at the close of the year amounts to $852,137.

CONSOLIDATED STATEMENT OF PROFIT AND LOSS OF THE PORTO RICO RAILWAYS

For Year Ended Dec. 31, 1927

Net profit from operation for year after providing for depreciation		$407,685
Less:		
Interest on bonds—		
First mortgage	$106,495	
Refunding mortgage	64,624	
		171,120
		$236,564
Less:		
Income tax reserve		50,000
		$186,564
Deduct:		
Dividend on preferred stock	$70,000	
Dividend on common stock	90,000	
		160,000
		$26,564
Add:		
Balance at credit, Dec. 31, 1926	$925,572	
Less amount applicable thereto for increased reserves for:		
Income tax	$50,000	
Depreciation	50,000	
	100,000	
		825,572
Combined surplus carried forward		$852,137

The sum of $394,867 was expended on capital account during the year represented in part by the purchase of six modern type passenger cars and the erection of a new general office building.

The net working capital now amounts to $275,932, showing a decrease of $112,211 compared with the previous year, which is accounted for, according to President Killam, by the large expenditure on capital account.

Traffic Falls Off in Fort Wayne

The gross operating revenue of the Indiana Service Corporation, Fort Wayne, Ind., for the year 1927 was $4,459,215 compared with $4,345,946 in 1926. After deduction of operating expenses including retirement charges, bond interest and taxes, there remained a net income available for the payment of dividends of $433,830. Payment of dividends on the preferred and common stocks left the sum of $118,084, which was carried to the surplus account. These facts were contained in the annual report to the stockholders for the year ended Dec. 31, 1927.

Passengers carried on the company's city and interurban cars and motor coaches decreased 4.95 per cent from 1926. The number of revenue passengers carried on city divisions was 23,210,560 compared with 24,417,745 in 1926, while revenue traffic handled by the interurban lines decreased from 1,250,100 to 1,187,258 riders.

In an appendix to President Feustal's report is a chart showing passenger traffic since 1921. The story in figures is as follows:

1921	18,403,811
1922	20,805,562
1923	24,575,686
1924	25,327,227
1925	25,648,155
1926	25,667,845
1927	24,397,818

A general program of rehabilitation was carried on during the year on all the company's local and interurban railway lines. The improvements included reconditioning, reballasting, laying of new ties, rebuilding and double tracking.

There were 5,543 stockholders of record on the company's books at the close of the year, compared with 4,238 at the end of 1926, an increase of 1,305 or 30.8 per cent.

For the third consecutive year, the company presented to its employees as Christmas gifts a total of $1,227,900 in certificates of life insurance paid up for one year. Issued under a group policy, the certificates are given each Christmas to all employees who have been in the service of the company for six months or longer. Six hundred and ninety-four employees availed themselves of the privilege extended of subscribing for additional insurance at low group rates, the total thus subscribed for being $846,900.

Would Abandon 15-Mile Line in Maine

The Androscoggin & Kennebec Railway has petitioned the Public Utilities Commission for authority to abandon the 15-mile line operating between Augusta and Winthrop, Me., built in 1902. In the petition the company sets forth that a substantial sum could be realized from the salvage of the property devoted solely to operating the line; and that this sum would be materially reduced and finally lost through continued operation of the line.

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Legal Notes

ALABAMA—*Authority of City to Permit Abandonment of Car Line Upheld.*

As the result of a proposed extensive system of rerouting recommended by a traffic expert engaged by the city, a company received permission from the city authorities to abandon a line. A bill for injunction brought by owners of property along the line against this abandonment was overruled. [B. E. Co. vs. Allen et al., 117 S.O., 199.]

ARKANSAS—*Operation of Car on Left-Hand Track, Because of Flood, Not Negligence.*

The mere fact that a street car was operated on the left-hand track across a bridge because the right-hand track could not be used on account of flood conditions was not negligence. It was the duty of the company, as well as its right, to operate its cars across the bridge for the convenience of the public. [Inter-City T. R. Co. vs. Worden, 6 S.W., (2d), 547.]

FEDERAL SUPREME COURT—*Tax on Gross Receipts of Transportation Companies, Not Applying to Individuals Conducting Same Kind of Business, Held Unconstitutional.*

The state of Pennsylvania taxes transportation companies doing business in that state at the rate of 8 mills per dollar of gross business received from passengers and freight traffic transported wholly within the state. This tax was assessed against a New Jersey Company, which conducted a taxi-cab business in Philadelphia. The company claimed that this tax was a violation of the equal protection clause of the 14th Amendment of the federal Constitution, as the same tax was not collected from individual taxi-cab owners doing like business. The Supreme Court held this amendment requires that any state tax classification must be based on real and substantial differences, having reasonable relation to the subject of the legislation. In this case, however, a tax on gross receipts was made to depend on the character of the owner, a purely arbitrary basis. The tax, therefore, cannot be sustained. [Quaker City Cab Co. vs. Commonwealth of Pennsylvania, 48 S. Ct., 553.]

INDIANA—*Generally, Street Railways Not Required to Warn Alighting Passengers of Obvious Danger From Automobiles.*

A statute requires motor vehicles passing street cars on the streets of any town or city to allow a lateral distance of not less than 20 ft. when the car has been stopped to permit passengers to alight. An able-bodied passenger, nineteen years old, and in full possession of his faculties, was injured by a passing automobile while he was descending from a one-man car at a regular stop. The company was held not responsible for neglect of the motorman to warn him of any danger, though the motorman saw the automobile approaching. [T. H., I. & E. E. Co. vs. Evans, 161 N.E., 671.]

MASSACHUSETTS—*Extended Discretion Given to Public Utility Commissioners in Grant and Revocation of Certificates*

A bus operator accepted a certificate from the State Department of Public Utilities permitting him to operate over a certain route, subject to various provisions and the right of the department to revoke his certificate after a notice and hearing. Later, the certificate was revoked because the operator had taken on and discharged passengers at prohibited points. The power of the commission to revoke the charter was upheld, the court saying: "The certificate was a privilege. It was neither a contract nor property, and its revocation deprived the petitioner of no vested rights. [Roberto vs. P. U. Commissioners, 160 N.E., 321.]

MINNESOTA—*Statute Requiring Certain Common Carriers to Obtain Certificates of Convenience and Necessity Upheld.*

A statute was passed prohibiting intrastate common carriers by motor vehicles from using highways unless they obtain certificates of convenience and necessity. The statute declared that its provisions should also apply to interstate commerce but only as may be permitted under the provisions of the Constitution and acts of Congress. Exceptions to the need for certificates were made of motor vehicles engaged exclusively in the transportation of children to or from school, those transporting farm products from point of production to the primary market, those delivering dairy products, freight carriers between contiguous municipalities, taxi cabs, and hotel buses. The constitutionality of the act was affirmed. A bus operator cannot claim exemption from the statute because he was operating his line at the time the statute was enacted, or to claim exemption as an interstate carrier, because he was carrying mail as well as passengers upon a federal aid highway at the time of its enactment. [State vs. Le Febvre, 219 N.W., 167.]

MISSOURI—*Responsibility of Company When Passenger Is Removed From Car.*

A passenger apparently asleep was shaken by a conductor, then, with the assistance of a police officer, was removed to the sidewalk. Before a patrol wagon which had been summoned to take him to a hospital had arrived, he died. The cause later was diagnosed as chronic nephritis. The company was held not responsible for any act of the police officer which was done wholly in his capacity as police officer and not at the defendant's direction, and the conductor and motorman were held not negligent. [Kirkpatrick et al. vs. Wells, 6 S.W. (2d), 591.]

NEW JERSEY—*Accident When Umbrella Obscured Vision of Pedestrian.*

A pedestrian crossing a street intersection during a rain storm with her umbrella in such a position that it obscured her vision in the direction from which a street car approached, was held guilty of contributary negligence as a matter of law. [Cady vs. T. & M. C. T. Co., 141 A, 806.]

NEW YORK—*Bus Line, Beginning and Ending in One State, but Passing Through Another, is an Interstate Carrier*

A bus line whose route begins and ends in one state, but between these termini passes through another state, is an interstate carrier. State statutes, which require a certificate of convenience and necessity and the consent of local authorities for intrastate lines, do not apply to it. [Garrison vs. Paramount Bus Corporation, 227 N. Y. Sup. 511.]

OHIO—*Right of Way at Street Intersection Defined*

Priority, or right of way, at street intersections does not mean the right to proceed uninterruptedly. It means a preference given to certain vehicles, but a preference which must be exercised with reasonable care. Thus, the driver of a vehicle not entitled to priority may properly assume that one who is will not approach the intersection at an excessive speed. [Presti vs. Cleveland R. Co., 160 N.E., 508.]

OHIO—*Misrepresentations Justify Cancellation of Operating Certificate*

Individuals claiming to represent a bus company received a certificate of public convenience and necessity, whereas on the date it was received, they had issued no capital stock and had no stockholders nor board of directors nor legally elected officers. When this fact was discovered, the commission was justified in recalling and cancelling the certificate. [C. & Z. T. Co. vs. P. U. Comm., 160 N.E., 458.]

PENNSYLVANIA—*Duty to Look and Listen Applies to all Occupants of Automobile.*

It is the duty of persons, when about to cross the tracks of a street railway, to look and listen for approaching cars and continue to do so until the track is safely crossed. Where an automobile contained three occupants, all engaged in the common business of salesmen, each occupant was charged with the negligent act of either of the others. [Griffiths vs. L. V. T. Co., 141 A., 300.]

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Personal Items

Howard P. Savage With Marigold Coaches

Howard P. Savage, past national commander of the American Legion and formerly assistant general manager of the Chicago, North Shore & Milwaukee Railroad, has assumed his duties as general manager of the Marigold Motor Coach Lines comprising the Metropolitan System, with headquarters at 72 West Adams Street, Chicago. He succeeds Fred A. Klock, resigned. Marigold coaches operate over a network of routes to the north and west of Chicago. They connect suburban communities throughout the metropolitan area with the Chicago Loop, either directly or through the rail lines which they serve as feeders.

The appointment of Mr. Savage to this post comes after an extensive period of service in the electric railway transportation field. Following his graduation from Lewis Institute in Chicago and a course of study at the University of Wisconsin, he entered the service of the Chicago Rapid Transit Company in 1913 as a track foreman on the former Metropolitan West Side Elevated Railroad. He rose to the position of general superintendent of maintenance-of-way, in which capacity he was serving when he answered the call to the colors during the World War.

Overseas he served as an officer with the 55th Engineers, and on his return Mr. Savage resumed his duties with the "L" lines. He remained with the Rapid Transit organization until October, 1926, when he was appointed assistant general manager of the North Shore line. During the same month the American Legion conferred upon him its highest honor by electing him national commander at the Philadelphia convention. While serving as national executive of the veterans' organization, Mr. Savage led the "second A. E. F." to the Paris convention and on a good-will tour of Europe. He was actively engaged in his official duties with the North Shore line at the time of his recent appointment to his new post with Marigold Coaches.

William Fairlamb General Manager at Portsmouth, Va.

In order to promote closer co-operation between the company and the city of Portsmouth, Va., the Virginia Electric & Power Company has created the position of general manager of its properties in that city. To this post William Fairlamb, superintendent at Suffolk, Va., has been promoted.

E. H. Will, who has been assistant to Vice-President Thomas P. Walker, at Norfolk, Va., will succeed Mr. Fairlamb as superintedent at Suffolk.

George H. Smith recently resigned as sales manager at Portsmouth to become superintendent of the Norfolk-Portsmouth and Nansemond-Portsmouth bridges. He has been succeeded by Monteiro Nelson, assistant sales manager. George E. Schraudt, Jr. has been advanced to Mr. Nelson's place.

Mr. Fairlamb is a native of Richmond, a graduate in electrical engineering of Virginia Military Institute at Lexington, Va. He has been with the Westinghouse Company and was distributing engineer in Richmond before going to Suffolk.

Mr. Will is a graduate of Virginia Polytechnic Institute at Blacksburg, Va., and has been with the Virginia Electric & Power Company since 1922. He was formerly assistant electrical superintendent at Norfolk.

Changes in Providence Personnel

Alonzo R. Williams takes on duties of vice-president. Messrs. Lockhart, Anderson, Morris, Sjogren, Spencer, Thorsen and Hackett affected by change

THE duties of first vice-president of the United Electric Railways, Providence, R. I., were assumed on Aug. 1 by Alonzo R. Williams, who was elected to that position at a meeting of the directors on July 26. Mr. Williams, who has been general manager of the company since early in the current year, will also continue in that office.

A. R. Williams

In his new capacity, he will direct the details of operation which for a number of years have been in charge of President A. E. Potter. The appointment of Mr. Williams to take charge of the operation of the property resulted from a petition by Mr. Potter, who some time ago asked to be relieved of certain operating duties. Mr. Potter will continue as president of the company, a position he has held since Oct. 1, 1921.

In conjunction with the entering of General Manager Williams upon the duties of his new position a general reorganization of the transportation department of the United Electric Railways was effected Aug. 1. According to Mr. Williams the reorganization is expected to effect co-ordination in all departments.

Joseph A. Lockhart replaced R. Roscoe Anderson as superintendent of transportation. Mr. Lockhart has been with the company 25 years, and Mr. Anderson for 35 years. All matters pertaining to transportation upon the highways and relations between the transportation department and the street railways labor union will be in charge of Mr. Lockhart.

Harold G. Morris has been promoted to assistant to the general manager and will manage all organization and regulation in Mr. Williams' offices and will represent him in all departments of the company. Part of his time, also, will be given to constructive work. Mr. Morris, who for many years was secretary to President A. E. Potter, was made office manager with Mr. Williams last winter.

The vacancy caused by the promotion of Mr. Morris from his position as office manager will be filled by Arthur Sjogren, who has been in the office of the department.

The new department of Public Relations and Economics is headed by William B. Spencer, formerly assistant to the general manager. This department embraces matters of public relations formerly under the jurisdiction of Mr. Anderson and the department of Safety and Publication, discontinued a short time ago upon the resignation of the manager, H. K. Bennett.

Although his duties now will be more along constructive lines and in the further development of the transportation system instead of making new schedules, Hans. S. Thorsen will continue as supervisor of schedules for passenger service.

James A. Hackett, with the company, for 30 years, remains supervisor of traffic.

E. S. LYNES, property accountant and head of the fixed capital records department of the Georgia Power Company, Atlanta, Ga., has resigned to become affiliated with the Brazilian Traction Light & Power Company, São Paulo, Brazil, South America. He is to be plant accountant for the foreign utility, which operates in Brazil, Mexico and Spain, with home offices in Canada.

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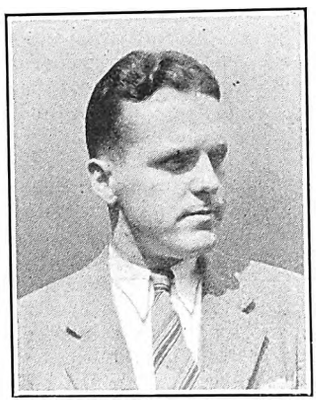
Pittsburgh's New Superintendent of Coach Transportation

Thomas Noonan chose discriminatingly when he selected Richard C. Gilmartin for the post of superintendent of motor coach transportation for the Pittsburgh Motor Coach Company in the recent rearrangement of the personnel of the Pittsburgh Railways, with which the coach company is affiliated. True, Mr. Gilmartin has been special coach representative of the company, but the holding of that position was in no way tantamount in itself to promotion to the important office this young official has been selected to fill.

Mr. Gilmartin has been in the post from which he was promoted for about a year and a half. If there is anything about the company's operation that he does not know, observers who have



R. C. Gilmartin

talked with him have not discovered it. The special coach representaive has had a lot to do. The Pittsburgh buses are popular, and Mr. Gilmartin as their special representative was fairly busy booking them to the best advantage, but not so busy that he did not absorb a lot of information about the coaches in regular service, their mechanical performance and their possible future.

The last was the thing that stirred his enthusiasm most. Sales were what he saw, for had he not served six years with the United Electric Light Company, to which he went from Duquesne University? It is with companies of that kind the selling instinct is kindled and so it was with Mr. Gilmartin. With such companies something new in sales is always in prospect, and the new superintendent of motor coach transportation absorbed a lot there which he put into practice in Pittsburgh, under the guiding hand of Mr. Noonan, general manager, than whom there is probably no abler merchandiser of transportation in the bus field, certainly among electric railways. The enthusiasm for the job was there on the part of Mr. Gilmartin. All Mr. Noonan had to do was to direct it a little. The report of the company for the year ended recently, made the subject of editorial comment in the JOURNAL for June 16, page 951, illustrates strikingly the achievements of Mr. Noonan, Mr. Gilmartin and the others concerned in the operation of the 60 vehicles now run by the company which conducts the Pittsburgh motor coach service.

W. J. Hagenah Joins Byllesby Management

W. J. Hagenah will join the Byllesby Engineering & Management Corporation as vice-president and special counsel on or before Sept. 1. Mr. Hagenah is one of the best known authorities on public utility valuations and rates in the United States. The firm of Hagenah & Dorsey will be dissolved as of Aug. 16.

John B. Tinnon Succeeds W. R. Hulbert With Thermit

John B. Tinnon has been appointed manager of sales of the Thermit department of the Metal & Thermit Corporation, New York, succeeding W. R. Hulbert, who has resigned to enter the firm of Thomas H. & Milan H. Hulbert in Chicago.

Mr. Tinnon was educated at Vanderbilt University. He entered the electric railway field in 1908 in the engineering department of the Chicago City Railway. He served as assistant engineer during the very extensive rehabilitation of the property and in 1912 was appointed engineer of way of the Chicago & Joliet Electric Railway, which position he occupied until 1918 when he served in the ordnance department of the U. S. Army. In 1919 he returned to the Chicago & Joliet Electric Railway as chief engineer. In 1924 he became connected with the Metal & Thermit Corporation as manager of the rail welding department.

Mr. Hulbert was graduated from Columbia University in 1904 with the degree of mechanical engineer. He was then connected in succession with the Power & Mining Machinery Company, the Rand Drill Company (now the Ingersoll-Rand Company) and the Kobbe Company, New York. While with the Kobbe company, he acted as managing editor of "Compressed Air," being published by that company at that time. In 1907 he entered the employ of the Goldschmidt Thermit Company as assistant engineer. When the Metal & Thermit Corporation was formed in 1916, he was made sales manager of the Thermit department.

A. C. DUGLE, auditor for the Indianapolis & Cincinnati Traction Company since 1922, with offices at Rushville, Ind., has resigned to become associated with the Lake Shore Electric Railway as traveling auditor with office in Sandusky, Ohio.

W. M. BERNETHY has been appointed assistant secretary of the Chicago, South Shore & South Bend Railroad, Michigan City, Ind. He has been associated with the railroad for more than fifteen years as a special accountant.

M. V. Robb Takes On New Utility Interests in Reading

Marshall V. Robb, the new owner of the Allentown & Reading Traction Company, with headquarters in Reading, Pa., is actively interested in utility development in Indiana and Kentucky. He was formerly connected with the Wabash Valley Electric Company at Clinton, Ind., and was a former vice-president of the Northern Indiana Power Company, the Indiana Electric Corporation and the Central Indiana Power Company.

Possessed of no technical education, Mr. Robb has applied himself wholeheartedly to the public service industry until now he has a practical knowledge of the business. He is, however, reticent on his plans and accomplishments. A native of Clinton, Ind., he

M. V. Robb

intends to move from Indianapolis, his present home, to reside in Reading, Pa.

The company in which Mr. Robb has purchased the controlling interest has been in operation since 1900. The story of its passing into new hands was told in ELECTRIC RAILWAY JOURNAL, issue of July 28, 1928, page 163.

A. R. Ireland and J. N. Breese in New Rôles

A. R. Ireland, assistant to the superintendent of employment of the Pacific Electric Railway, Los Angeles, Cal., has resigned to become connected with the Railway Mutual Building and Loan Association, a local railroad men's association, which has grown to more than a million dollar corporation in its first 20 months of operation.

J. N. Breese, who since 1918 has held various positions in the accounting, freight and transportation departments of the company, has succeeded Mr. Ireland.

RICHARD SUTRO, of Sutro Bros. & Company, New York investment bankers, has been elected a vice-president of the New York, Westchester & Boston Railway, operating a high-speed line out of New York City through Westchester.

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Manufactures and the Markets

Changes in Westinghouse Air Western Office

C. J. Olmstead, western manager of the Westinghouse Air Brake Company at Chicago has been appointed assistant to the vice president. He will be succeeded by C. D. Foltz, who has been assistant western manager to Mr. Olmstead since 1926, and A. K. Hohmeyer has been appointed assistant western manager.

Mr. Olmstead came to the Westinghouse Air Brake Company in 1905 as commercial representative in the Chicago district office, after a connection with the Pullman Car Company of fifteen years. In 1912 he was appointed assistant western manager, and in the following year was appointed western district manager, which position he has held ever since.

C. D. Foltz joined the Westinghouse Air Brake organization in 1910 in the capacity of mechanical expert, located at Denver. Shortly after he was transferred to Salt Lake City. In 1920 he was appointed representative of the Westinghouse Air Brake Company at Salt Lake City, and in 1923 he was transferred to Denver in the same capacity. He remained in Denver until 1926 when he was promoted to the position of assistant western manager of the Western District in Chicago, which position he has held until his present appointment.

A. K. Hohmeyer came to the Westinghouse Air Brake Company in 1901 in the clerical department at Wilmerding. Here he was active in various positions until 1909 when he was transferred to the Chicago office. In 1913 he was appointed representative at that place, and he held that position until 1920 when he was appointed assistant western district manager. A year later he accepted a position with the Southern Wheel Company, which he occupied until recently, when he returned to his former field of activity with the Air Brake Company.

Texas Company to Take Certain Galena Properties

Agreement has been made for sale to the Texas Corporation of all outstanding capital stock of the Société Anonyme des Huiles Galena, France, and Galena Signal Oil Company of Ireland, as well as floating equipment of the Galena Navigation Company. Under this agreement the company will be paid for inventories and retain for its own account all cash, securities and net accounts receivable of the French and Irish companies.

The Texas Corporation also has offered to purchase certain other properties of the company and all major properties of the Galena Signal Oil Company of Texas, and its subsidiary Galena Pipe Line Company of Texas, plus their inventories. The proposal also involves sale of all outstanding capital stock of Galena Signal Oil Company Sociedade Anonima Argentina and Sociedade Anonyma de Oleo Galena-Signal Brazil on the same basis as the French and Irish companies.

The board of directors has approved the proposed transaction with the Texas Corporation.

Business in a Buying Age

Buyers know what they want and sellers must do business accordingly. The purchasing agent defended

G. A. RENARD, secretary-treasurer of the National Association of Purchasing Agents, in the New York *Times* recently discussed the status of the purchasing agent with particular reference to some of the criticisms which have been leveled at this increasingly important cog in the industrial and business world. He said in part:

To say, as has been charged, that the rank and file of purchasing agents, of which there are some 8,000 in the country, buying approximately $7,000,000,000 worth of merchandise annually, are responsible for demoralized market conditions is grossly unfair. In fact, this charge was definitely refuted at a recent conference attended by the executives of thirty leading industries which do a very large business with purchasing agents.

The thought developed at that conference was that if the question of overproduction is eliminated, such criticism of purchasing agents comes more from sellers who are not able to produce economically than from a real basis of complaint regarding unethical practices of buyers, and that for every so-called unethical practice of the latter many more could be cited against the sellers or their representatives.

For years the country was in a selling age. All the way from retailers to manufacturers the compelling urge was to sell, without a great deal of attention being paid to how to buy most efficiently. The explanation is that this stage was necessary in the country's expansion of business and industrial production. But through it all was the idea that business was like a horse trade—somebody was going to get skinned.

Now the business scene has been and is changing before our very eyes. We see it in many forms. In this change the purchasing agent has come forward and is now regarded as exercising one of the principal functions of management. He knows his firm's requirements thoroughly and his business is increasingly efficient because more and more he is buying as an engineer on specification and on the tests and reports of laboratories. His work is now centralized, whereas before his advent buying was haphazard and scattered.

The curious part of this situation is that many sellers have apparently been blind to these developments. They have tried to do business under old methods and with plants and production systems that are not economical and hence not in tune with today's conditions. When they found they could not do business on the old basis then the cry arose of demoralized markets and unethical, unsettling practices.

I recently heard two comments that I believe are apropos of the situation. One is that a large number of manufacturers have been playing "put and take"—but they have tried to make it all take and no put, as found by the Ninth International Cost Conference held in June. The other expressive of changed ideas is that the successful sales manager is no longer training his men to be "go-getters," but is now preaching the doctrine of "go and give service."

Today the science of purchasing is guided by four principles. These, in order of importance, are: Suitability of material to requirements, availability, reliance to be placed on seller's statements, and, finally, price. These standards, to say the least, are a far cry from those of ten or twenty years ago when buying was almost entirely done on price and sentiment.

While price has been placed last as a determining factor, it goes without saying that the purchasing agent must retain the right to select those with whom he does business. The buyer is just as much interested in a fair profit as the seller is, but

The Exhibits a School of Experience

IN PREVIOUS years Wednesday of convention week has been set aside for inspection of exhibits. This year a change has been made. Tuesday, Sept. 25, will be inspection day. There will be no convention sessions that day.

More than 100,000 sq.ft. of space in the Cleveland Auditorium group will be occupied by the A.E.R.A. exhibit. There will be on display the very latest offerings of the manufacturers for the more efficient and more economical operation and maintenance of service. It appears to President Stevens that none of us can be truly up-to-date unless the exhibits are inspected carefully and the manufacturers and their representatives are listened to attentively concerning the devices, equipment, and materials which they go to such expense and pains to put before the operating executives and their staffs.

As Mr. Stevens sees it, too much credit cannot be given the manufacturers for their enterprise and their co-operation with the industry and the association. His plea to executives is that they make a note of Tuesday, Sept. 25, as exhibit inspection day, and see that their engineers and maintenance superintendents and foremen are present in Cleveland on that day.

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he cannot guarantee every seller a profit, since the seller and not the buyer determines the price at which the material is sold. It is not hard-boiled buying but weak-kneed selling that unsettles commodity markets, or as one prominent industrial editor puts it, "creates price cowardice."

The rush to gain volume has rendered profit margins slim in many lines and the seller must cut his costs if he is to stay in competition. I agree with the statement recently made by a well-known executive that "the one sure way to wreck American business is for buyers to guarantee a profit." To do so would remove all incentive for economic production. Still more strenuous competition lies ahead, with European nations beginning to regain their economic stability.

The trend toward mergers has featured business during the year and the results of these combinations undoubtedly will mean still more effective purchasing. They, however, do not necessarily mean lower margins for sellers of materials because it must also be considered that the sales cost to the seller is or should be correspondingly reduced.

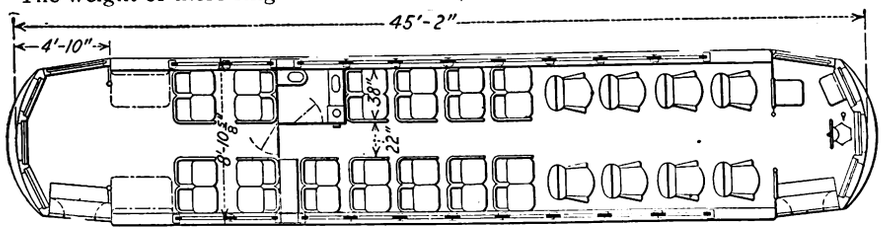
METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

	July 31, 1928
Metals—New York	
Copper electrolytic, cents per lb	14.525
Copper wire, cents per lb	16.625
Lead, cents per lb	6.20
Zinc, cents per lb	6.55
Tin, Straits, cents per lb	47.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.15
Somerset mine run, f.o.b. mines, net tons	1.75
Pittsburgh mine run, Pittsburgh, net tons	1.70
Franklin, Ill., screenings, Chicago, net tons	1.58½
Central, Ill., screenings, Chicago, net tons	1.47½
Kansas screenings, Kansas City, net tons	2.25
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.3
Weatherproof wire base, N.Y., cents per lb.	17.125
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.3
White lead in oil (100-lb. keg), N. Y., cents per lb	13.25
Turpentine (bbl. lots), N. Y., per gal	$0.58

Indianapolis and Southeastern Car Specifications

Ten cars are being built for the Indianapolis & Southeastern Railway, Indianapolis, Ind., by the Cincinnati Car Company, Winton Place, Ohio, as mentioned in the June 2 issue of this paper. These cars are of the one-man, motor, interurban, passenger type, seating 38 passengers.

The weight of these single-end double-truck cars is 38,000 lb. being 46 ft. 2 in. long and 8 ft. 10⅝ in. wide. The bodies are semi-steel with arch roofs and folding end doors. The cars will be equipped with duplex air-magnetic rail brakes similar to those tested recently on the railway's lines. Further details of the cars are given in the accompanying specifications.



Floor plan of the new cars being built for the Indianapolis & Southeastern Railway

Weights:	
Car body	16,340 lb.
Trucks	11,400 lb.
Equipment	10,260 lb.
Total	38,000 lb.
Bolster centers	26 ft. 10 in.
Length over all	46 ft. 2 in.
Length over body posts	35 ft. 6 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 10⅝ in.
Height, rail to trolley base	10 ft. 8½ in.
Window post spacing	33 in.
Body	Semi-steel
Roof	Arch
Doors	Folding, end
Air brakes	General Electric, straight with full safety feature
Armature bearings	Plain
Axles	Bethlehem open-hearth hammered
Car signal system	Consolidated
Conduit	Flexible
Control	K-75
Curtain fixtures	Railway Curtain Company
Curtain material	Pantasote, silk-lined
Destination signs	Keystone roller
Door mechanism	Consolidated
Doors	Folding
Energy saving device	Economy meter for one car
Fare boxes	Cleveland
Finish	Duco
Floor covering	Armstrong linoleum
Gears and pinions	General Electric, heat treated
Glass	Plate
Hand brakes	Cincinnati vertical aluminum wheel
Heat insulating material	Cork board and salamander
Heaters	Consolidated
Headlights	General Electric J-65
Headlining	Haskelite
Interior trim	American walnut
Journal bearings	Plain
Journal boxes	Cincinnati cast steel
Lamp fixtures	Dayton Manufacturing Company
Motors	GE-247I, outside hung
Painting scheme	Ten color combinations
Roof material	Wood, canvas covered
Safety car devices	Full safety car devices
Sash fixtures	Rex No. 24, ¼ in. brass sash
Seats	H-K Model Pullman revolving chairs and 900-A double bucket
Seat spacing	33 in.
Seating material	Pennsylvania R.R. quality green plush
Slack adjusters	Cincinnati, turnbuckle type
Steps	Stationary
Step treads	Kass safety
Trolley retrievers	O-B No. 13119
Trolley base	Nuttal-Schweitzer
Trolley shoe	Miller
Trucks	Cincinnati cast steel side frame
Ventilators	Nichols-Lintern type "C"
Wheels, type	Carnegie rolled steel, 28 in. diameter
Wheelguards	Steel pilot

ROLLING STOCK

POTOMAC EDISON COMPANY, Hagerstown, Ind., has ordered four 21-passenger street car type Studebaker buses.

WINNIPEG ELECTRIC RAILWAY, Winnipeg, Manitoba, has accepted delivery of five Mack four-cylinder chassis, 196-in. wheelbase buses.

DALLAS RAILWAY & TERMINAL COMPANY, Dallas, Tex., has ordered seventeen Peter Witt type cars from the St. Louis Car Company. Mention of the plans to purchase these cars was made in the June 2 issue of the JOURNAL.

TRADE NOTES

THE ROLLER-SMITH COMPANY, New York, N. Y., announces the appointment of Elliott E. Van Cleef, 59 West Jackson Boulevard, Chicago, Ill., as its district sales agent in the Chicago territory. Michael B. Mathley, who has been connected with the Chicago office for many years, will be associated with Mr. Van Cleef.

LANG BODY COMPANY, Cleveland, Ohio, announces that the Economy Electric Devices Company, Chicago, Ill., is handling the street railway field for it and will be its representative in the central district. R. H. Newcomb, formerly with the New York, New Haven & Hartford Railroad, is handling the New England territory, with offices at 950 Tremont Building, Boston, Mass. A. H. Sisson, Grand Central Terminal Building, New York City, is representing the company in the New York district and the southern states.

ADVERTISING LITERATURE

PITTSBURGH TESTING LABORATORY, Pittsburgh, Pa., has issued a bulletin on inspecting creosote pine poles and piles. It contains a description of treating and inspection of poles and piles and the reasons for inspection of creosoted materials.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, East Pittsburgh, Pa., announces a new 24-page pamphlet on electrical equipment for railway signaling. This booklet, designated by circular number 1787, covers a line of modern electrical equipment available for service in connection with the generation, transmission, control, protection, and maintenance of signal power.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, East Pittsburgh, Pa., has issued a new publication (DMF-5109) entitled "Some Reasons for Electrical Transmission on Self-Propelled Rail Cars."

EVERSHED & VIGNOLES, LTD., London, England, has published a 68-page booklet on insulation testing. This booklet covers the necessity for insulation testing, instruments used for that purpose, tests and their interpretation, practical applications, and some technical details of the megger and meg testing set.

LINK-BELT COMPANY, Chicago, Ill., has issued catalog No. 500 consisting of 1,088 pages and not only covers in engineering data and list prices of the companys' products, but contains considerable data for the engineer.

OXWELD ACETYLENE COMPANY, New York, N. Y., has issued a new catalog describing in detail the products manufactured by this concern, including welding and cutting equipment, and generators for the production of acetylene. The new items described are the type C-14 cutting blow pipe, the Carbic portable low-pressure acetylene generators, and the Carbic floodlights.

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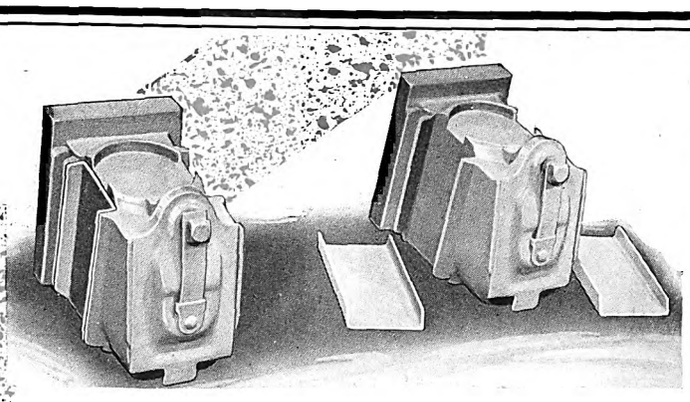

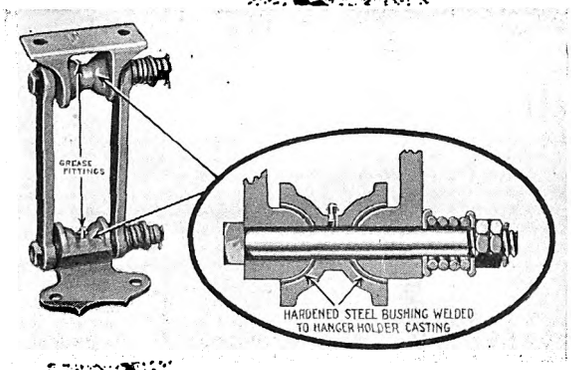

Brill Truck Improvements Reduce Maintenance

Wear caps for half-ball brake hangers and bushings for half-ball hanger holder castings are now standard practice on Brill trucks. This practice saves money because the worn parts can be renewed.

Half-ball brake hangers and bottom brake rods can be equipped with grease fittings at slight cost, which not only insures regularity of lubrication, ease of adjustment and noise reduction but also means a saving in labor and longer life for the more expensive castings.

Journal boxes for Brill pivotal trucks are now being equipped with wear plates which can be renewed when they become worn thus saving the cost of new journal boxes.

The Brill Slack Adjuster also contributes to reduced operating cost.

All these improvements provide greater efficiency and save money in Brill Truck operation.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. AUGUST 11, 1928 Twenty Cents Per Copy

For Performance and Profit

SUCCESSFUL bus transportation companies owe much of their success to the use of quality equipment, insuring dependability and better service to the public.

Hundreds of the most successful bus operators use White equipment. One hundred and forty-seven companies, including many electric railways, operate 4,150 White Busses in fleets of 10 or more. And this indisputable evidence of White's position in the bus field is made even stronger by the fact that hundreds of additional owners operate bus fleets of less than 10 Whites.

In buying a White you have a complete line to select from—fours and sixes—a bus that more and more operators are selecting. Performance and profits have built up the solid prestige that governs their choice.

THE WHITE COMPANY—*Cleveland*

White Bus Model 54, with six-cylinder 100 h.p. motor.

WHITE BUSSES

FOURS and SIXES

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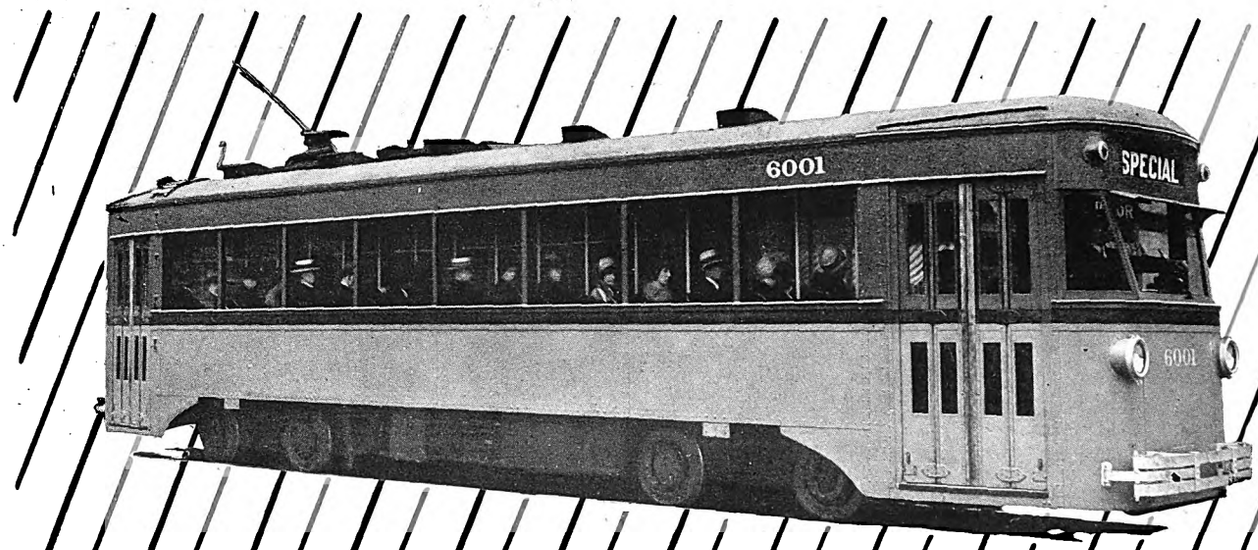
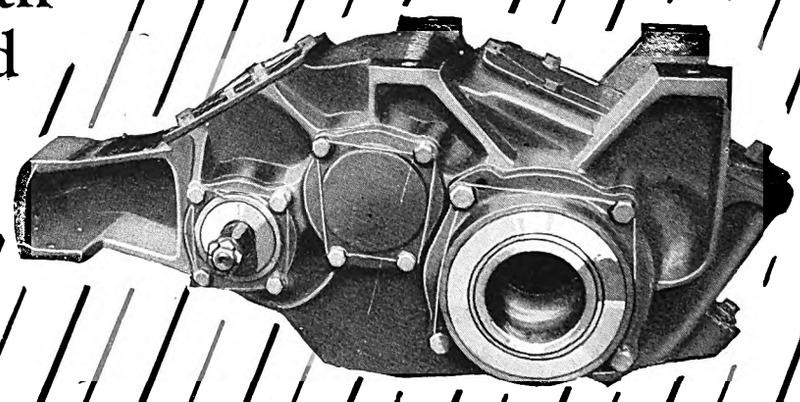


In modern cars, both Outward Looks and Inward Worth are needed to attract and hold the riding public



The New W-N Drive

The need for better looking cars; with smoother, faster operation, is becoming more apparent in the face of present-day automobile competition. For comfort, looks and appearance attract the patronage, and better operation is the means of holding it.

The new W-N Drive, a product of Westinghouse and Nuttall engineering skill, is one big factor in this modern trend toward high acceleration, smooth starting and quiet operation that helps to hold the patronage which better looking cars have gained.

Its high ratio of speed reduction, permitting use of light-weight, high-speed motors; its heat-treated, hardened helical gears, its Timken Roller Bearings and its oil-tight case all make it the symbol of the inward worth of better looking, rider-appealing, modern cars.

All Nuttall Products are sold through the Westinghouse Electric & Mfg. Co. district offices. Refer your inquiries to the nearest Westinghouse Office.

Canadian Agents:
Lyman Tube & Supply Co., Montreal, Toronto and Vancouver

Westinghouse - Nuttall

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of Street Railway Journal and Electric Railway Review
CHARLES GORDON, *Editor*

LOUIS F. STOLL, *General Manager*

Volume 72 New York, Saturday, August 11, 1928 *Number 6*

Recognizing the Growing Importance of the Exhibit

FOR MANY YEARS the annual convention of the American Electric Railway Association has been the occasion for several feature services to the industry by ELECTRIC RAILWAY JOURNAL. First of these has been the annual Convention Number, published just before the convention and summarizing the high spots of the industry's thought and progress. Throughout the local transportation industry, the convention issue has come to be looked upon as sounding the keynote of the year's activity. It is not only read carefully, but is preserved by operating executives throughout the world.

More directly associated with the convention itself have been two additional journalistic services; the Annual Report Number and the Convention Dailies. The Report Number carries a complete summary of the speeches and proceedings of the American Association meetings, and of its several affiliated associations. It is mailed on the day following the close of the convention so as to be available for reference and discussion by the time most of the delegates reach their homes. The dailies are published on Monday, Tuesday, Wednesday and Thursday mornings during convention week. They give to those in attendance a day by day report of what is transpiring at the convention, changes in program, news of people in attendance—in fact, everything that a daily newspaper of the convention implies.

Despite this seemingly complete service, there has been a growing need for something more. During the past several years the exhibit of railway and bus equipment and apparatus has increased rapidly in size and importance. Recognition of the growing importance of the exhibit at this stage of the industry's development is evidenced by the practice started last year of opening the convention on Saturday instead of Monday, to give delegates more time for the inspection of this costly array of physical equipment. In the Convention dailies the JOURNAL has for many years endeavored to give attention to the exhibits but has been handicapped by physical limitations and the pressure for time incident to the publication of a daily.

To overcome this limitation and to give to the exhibit the space and attention which its importance demands this year the JOURNAL will devote its issue of Sept. 22 entirely to the convention exhibit. This is the opening day and the purpose of the issue will be to give an adequate presentation and interpretation of the apparatus exhibited by various manufacturers and of the progress made during the year in the improvement of physical equipment. It will endeavor to give a comprehensive picture of the exhibit, just as the Report Number gives a complete summary of the convention proceedings. It will be available to delegates at the convention on the opening day and will be a valuable guide in drawing their attention to those features of the exhibit in which they may be particularly interested. In addition it will be available for reference to these delegates when they get home, and will for the first time take to those transportation men throughout the world who are unable to attend the convention, an adequate presentation of the new and improved products shown at the exhibit.

Dodging the Real Issue in Boston

NO DISPARAGEMENT of the work of the Legislature of Massachusetts is intended by thus referring to its passage of the bill for the extension of the Boylston Street Subway under Governor Square at Boston, but that was really the least important of the three relief measures which the Governor had urged. The other two related to the question of the extension of a period of public control of the Boston Elevated, and of the expansion of that company's rapid transit lines. These issues apparently were linked inseparately. How the tremendous costs of rapid transit construction shall be met is also up for settlement in Chicago, Pittsburgh, Cleveland and St. Louis, all of which have subway systems in contemplation.

Saddling the costs of improvements of this kind on the car rider has limitations. Theoretically, the idea of making the consumer pay for what he gets is sound, but the consumer in this case is not the only one who benefits. In the Boston case it is a nice theoretical question, that of the extent to which the car rider would have to contribute to meet each year the carrying charges on $35,000,000 to $40,000,000 of capital if he were to bear them alone. There the way to the assessment plan has been cleared by the ruling of the State Supreme Court to the effect that betterment may be assessed in connection with rapid transit line extensions. That, of course, is the logical arrangement, but it is difficult to get legislators, even when they understand the economics of the situation, to accept the onus which goes with the advocacy of an arrangement of this kind.

There is a growing conviction among those who have intensively studied the problem of rapid transit financing, that a subsurface street for transportation is comparable to any other street improvement and that the property owner who benefits should meet his proper share of the expense of the improvement. However, the property owner is influential and has a direct selfish interest. Naturally he is opposed to assessment for rapid transit improvement if there is a chance to load the burden on the general community, or the car rider. He is unwittingly aided and abetted by the car rider, who is unorganized and frequently fails to understand the situation. General taxation is always tempting as the easiest method of financing transit costs, but fortunately for the future of some cities, there is an upper limit to their bonding power. There appears to be reason to believe that the

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key to the Boston situation lies in the fact that though it understands the need and the justification for special assessment in the financing of new construction, the Legislature refuses to face that issue and prefers to "pass the buck" to whoever will accept it.

British Authorities Approve Standard Car

THAT fundamental ideas governing street car design in the British Isles do not differ greatly from those in this country is evidenced by the prize winning essay submitted by John F. Richards, rolling stock superintendent, Oldham Corporation Tramways, Oldham, England, at a recent meeting of the Municipal Tramway & Transport Association. Mr. Richards' ideal car could be set down in the average American city and found to be well adapted to the requirements of the riding public. It would meet with the approval of the maintenance engineers and shop force and would be readily acceptable by the trainmen who would have to run it. As a matter of fact there is scarcely a feature in Mr. Richards' ideal car, which, incidentally, exists only on paper, that has not already been incorporated into some of the cars actually built and in service in this country. The inference is plain that American designers at least are not deficient in original ideas.

Passenger comfort is paramount here as in England, but Mr. Richards gives this fact extra point by devoting a section of his paper to a discussion of comfort features viewed from the passenger's rather than from the engineer's standpoint. Individual upholstered seats, arranged in pairs facing forward, and with plenty of elbow and knee room are provided, while wide, clear-vision windows, soft lighting effects and ample but well-regulated ventilation, supplemented by electric fans, contribute to the restful effect.

From a mechanical and structural standpoint also, the British plan differs very little from the American, as exemplified in certain recent patterns. There is the same trend toward light weight and ample spring suspension of motors; the same preference for mechanical operation of doors, steps and sanding devices; the same effort to produce a vehicle of pleasing appearance. The influence of the automobile is to be noted in the recommendation of worm drive and internal expanding brakes. The importance of speed in loading and unloading is evidently appreciated in England, since the principle of the circulating load is incorporated.

The fact that Mr. Richards' article was awarded first place in a widely entered contest gives weight to the ideas proposed. They can be taken as representative of the most advanced British thought on the subject and additional emphasis is given to the principle of standardization in car design. In England, as in this country, the passion for individuality in design has cost the industry heavily in the past. It may flatter the pride of the local manager to have his new order of cars custom built but with fundamental specifications so generally agreed upon there is little excuse for this independence of spirit. Mass production of standard designs has placed the automobile industry in the first rank. This same principle has been extended to the manufacture of buses and if it could be applied to the production of street and interurban cars costs would be reduced and financing simplified. It will be interesting to watch the effect of Mr. Richards' suggestion upon forthcoming orders for rolling stock in the British Isles.

Not Mentioned in the Rules

COURTESY and politeness on the part of trainmen have long been recognized as attributes which will do much to further the comfort of patrons and increase the sale of transportation. But there are ways in which these qualities can be demonstrated that are not listed in the ordinary duties of the car operator. Witness the following incident:

A sudden severe thunder shower overtook the riders in a street car on a heavily-traveled line. The car was of an old type, with side seats and window sash which dropped into pockets in the sides. The male passengers struggled to close the windows and ventilators as best they could. Some of the windows, being of the well-known immovable type, refused to budge. From others the glass was missing, so that pulling up the sash was literally an empty gesture. The passengers drew the shades over such of them as would not close, although some of the fixtures were out of order and the curtains flapped in the wind, sprinkling water over a wider area than had they been left alone. Seats were wet, passengers had their clothing soaked, and confusion reigned.

Through all the storm the conductor paid not one bit of attention to the discomfiture of the passengers. He never moved from his position on the rear platform. His posture and appearance as he leaned against the railing were those of the corner loafer. Apparently he was content. Had he not discharged his entire responsibility when he saw the fares drop into the box!

Of course, it is not easy to make a definite statement that patronage has been lost by such an action. People in a large city have to ride. In fact, some of the passengers did not seem to appreciate that it was any part of the conductor's duty to look after the comfort of the passengers. That such a thing can happen on a car today, after all the talks and articles on the place of the operator—the company's salesman—does not speak any too well for the management. No matter how badly a company is off financially there can be no excuse for failure to perform tasks that, while out of the ordinary, are so obviously a part of the day's work that no rules should be needed to call them to the attention of the conductor.

Machine Accounting Offers Economy

VISITS to the accounting departments of several of the larger electric railways provoke the prophecy that the next few years will see an intensive development in office methods directed toward the substitution of machines for human labor. The development of equipment of this type is coming so fast that even the office appliance specialist is kept on the jump to remain abreast of affairs.

It is understood that five of the largest industrial concerns in the United States have established departments to function as laboratories for experimenting with better methods for handling office work. These organizations realize that specialization is essential to progress in any field. In the same sense, it is only natural to expect that on the larger electric railway properties, whose business involves the handling of freight as well as passengers, increased emphasis should be put on an office efficiency to match that of the operating and maintenance departments.

An outstanding example of the possibilities in mechanical appliances for the office is the recent reorganization

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by a Western steam railroad of its division accounting system at a cost of approximately $80,000. Annual economies resulting from the modernized practices are said to be climbing above $40,000, with $50,000 as a not impossible goal. In other words, the cost of the new equipment is being offset by the savings of each two years or less.

Perhaps the biggest factor in the mechanization of office routine is the relation of machine cost to labor cost. The average life of an office machine is variously estimated at from eight to ten years. On this basis it would often pay to double the mechanical equipment of an office if even a relatively small saving in labor cost could be made. This is treating the problem solely from the point of view of economy without reference to the recognized mechanical advantages of speed, accuracy, thoroughness and legibility of records. The accounting offices of electric railways offer a prolific field for the use of modern machines in the interests of better service and increased net revenues.

More Liberal Car Purchase Terms in Prospect

SIGNIFICANT, indeed, is the promise of more liberal terms for financing the purchase of electric railway cars under the equipment trust arrangement. As the result of the work done by the American Electric Railway Association Committee on Electric Railway Finance, some of the car builders and manufacturers have expressed a willingness to liberalize the terms of payment for car purchases where the conditions are such as to warrant it. There also seems to be a prospect, at least, of ultimately interesting certain banking groups in the possibilities offered by the liberalization of credit terms to electric railways for car purchases.

Based upon its study of the situation, the finance committee has pointed out that the permanent improvement of the status of electric railways is dependent upon improving the character of their equipment. Convincing figures showing large savings in operating costs following the installation of new cars, to say nothing of their effect upon increased revenues, were contained in the report made last year by the association's special committee on the essential features of modern cars. Other statistics in the technical press, data collected by the manufacturers, and records of many operating companies, lend additional emphasis to the importance of car replacement as a means of improving electric railway earnings. All of these available data are cited by the finance committee in urging the need for more liberal terms of payment to permit cars to be purchased out of the savings which they would effect.

On many roads which properly deserve the extension of credit, new cars bought in lots of ten or more, with a down payment of 15 per cent, could pay their own way in actual savings during a period of ten years and leave an attractive margin to spare. But it is obviously impracticable to pay for cars on terms of 25 per cent down and five years for the balance, without credit resources beyond current earnings. Such credit it has been extremely difficult for many properties to get at advantageous rates. This has put badly needed new equipment beyond their reach. In view of that condition, the more liberal terms which are now apparently assured should make it possible for many railways with obsolete cars that now present a down-at-the-heels appearance to make the important move toward obtaining modern equipment. Accompanying the improvement in facilities and service thus offered the public, there is assurance of a very material saving in operating costs over and above the annual payments on the new cars.

What Is a Sound Economic Basis for Retiring Bus Equipment?

ACCOUNTING procedure among many transportation agencies has been complicated in recent years by the necessity of taking care of bus depreciation. The simplest plan is, of course, the so-called straight-line method. This contemplates an estimate of the probable useful life of the equipment, and the setting up of a yearly charge to meet the difference between the original cost and the amount, if any, retrieved when the equipment is scrapped. Where this period of probable useful life happens to correspond with the period in which the equipment becomes obsolete, the method is self-correcting, but if obsolescence, as it is known as an accounting term, intervenes before the expiration of the period of probable life—as it did far too often with the street car—things are thrown askew.

The early disposition among the railways was, perhaps, to write the bus equipment off too quickly. The art was changing fast, there was no reliable guide to the length of life of the new vehicle, and replacement at frequent intervals was considered likely. But even here there is a chance for honest differences of opinion. The idea expressed elsewhere in this issue by H. E. Jordan is that a detailed cost accounting system greatly reduces the necessity of the unsatisfactory guess work of estimating the "fair life" of a bus, since such a system gives a sound economic basis for the retirement of the equipment. He has reduced almost to a formula the basis for determining the economic life of the bus, or for that matter any other unit of equipment made up of a large number of parts, each of a different wearing life. As he sees it the matter is governed by the point in the life of the major units where the difference in cost of maintenance between the old unit and the new unit, less the difference in the rate of depreciation, is equal to the interest on the new investment, namely, the cost of the new unit. As the author says, it is very probable that before the peak of the maintenance curve is reached, the higher cost of maintaining and operating the old bus over that of a new bus will justify its replacement.

The term "fair life" is, of course, not easy to define. As for obsolescence, two competent and experienced parties might disagree on the time a bus is obsolete and yet both might have sound reasons for their respective viewpoints. Only recently a large railway decided that it had not judged correctly the fair life of its buses. It had not been sufficiently optimistic and it said so. Another company operating 40 vehicles is charging about 10 per cent of the cost of its vehicles to depreciation, or an amount that approximated 12½ per cent of the total earnings last year.

Certainly, obsolescence is not the likely factor that it once was in the proper accounting of these vehicles, but that is no reason for repeating the policy so many companies did with the street car of thinking that a car was properly a car simply because it was possible to keep it in service. Too many railways made that mistake. That the disposition among them is not to make the same mistake now about the bus is distinctly to the credit of the railways even though at first thought that disposition may appear to militate against the bus.

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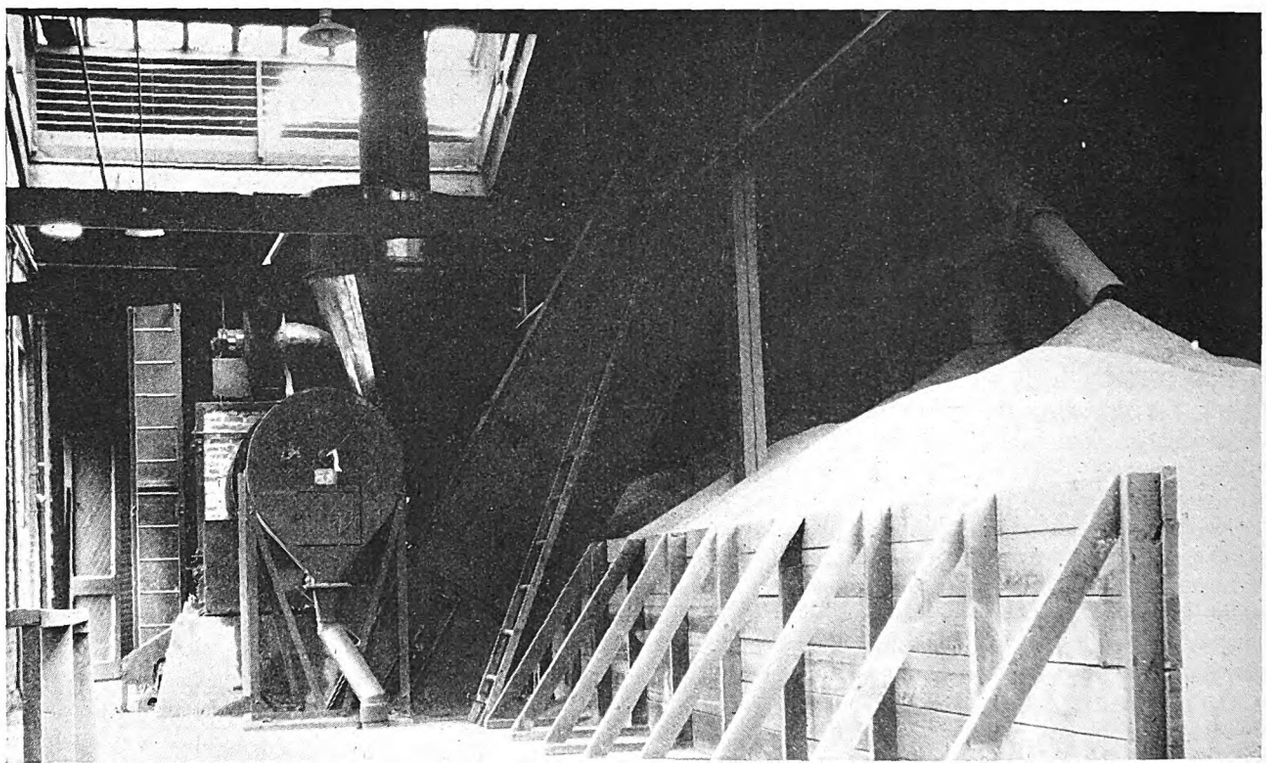
Pittsburgh Builds Modern Sand Drying Plant

By Newton E. Tucker
Way and Structures Division Pittsburgh Railways,
Pittsburgh, Pa.



General view of the Pittsburgh Railways' new sand drying plant. The dryer drum and the wet sand conveyor are on the left and the bin for the dry sand is on the right

Revolving drum dryer has a rated hourly capacity of 7 tons of sand having an initial moisture content of 6 per cent. Gas-fired heating oven is thermostatically controlled

SANDING is the most effective way of counteracting slippery rail and insuring the safety of everyone using streets on which electric cars are operated. Sand must, however, be dry and flow freely the instant the motorman touches his levers. With a yearly cost of approximately $40,000 for furnishing dry sand, half of which was for labor, the Pittsburgh Railways recently determined to modernize its sand drying methods.

The climate and topography of the Pittsburgh district require the use of more sand than is used in the majority of the cities of this country. There are many steep grades in the city and surrounding boroughs located in the foothills of the Allegheny Mountains. The grades vary from a quarter of a mile to 1½ miles in length, with slopes from 3 per cent to 7 per cent, and many sharp, dangerous curves. Winter brings numerous snow storms, seldom very heavy, but occurring almost daily. Last winter there was a freeze and thaw cycle every four to seven days. In the summer, too, sand must be used frequently, for soot from nearby mills and factories is mixed with frequent light rains and is tracked onto the rails by automobiles.

In the past the sand was supplied by drying stoves. These stoves were built of two steel cone shells, one within the other. Wet sand was shoveled by hand into the space between the two cones. A coal fire was kept within the inner shell for evaporating the moisture. When the sand dried it fell through holes punched in the outer cone. The system was supplied by twenty-four of these stoves located at fourteen different carhouses. One man operated two stoves, all the sand being supplied by hand.

With these scattered facilities it was difficult to obtain low prices for sand. Each district supervisor ordered the sand from the company most conveniently situated in his particular locality. In nearly all instances the cost of unloading by hand was from 10 cents to 15 cents a ton higher than dumping rates.

In November, 1927, a new machine built by the L. R. Christie Company of Pittsburgh was installed. This has a horizontal cylinder or drum, about 3 ft. in diameter and 20 ft. long. A kind of radiator tube in the shape of a cross is located in the center of the drum, full

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length, and batten plates are fastened along the sides of the outer shell. One end is inclosed with a screen and hopper, while the other end rotates in a brick, gas-fired oven. The sand enters the drum at the furnace end and is pushed down through the dryer by means of the batten plates and the slightly inclined angle at which the machine is set. While moving along to the discharge end, the sand becomes loosened and scatters through the hot gases and onto the center radiator tube. The screen prevents any large pebbles or sticks from going with the sand and shoots them down a pipe to a waiting flat car.

The oven is fired by six surface combustion high-pressure tile gas burners. The hot gases are mixed with about 200 per cent excess of air and are sucked through the dryer by a centrifugal fan. They enter the inner tube or radiator at the loading end, pass from the tube to the outer sand chamber at the discharge end, and are redrawn through the falling sand to be discharged to the atmosphere through the fan and dust catcher. Most of the moisture in the sand is evaporated when it comes in contact with the inner tube.

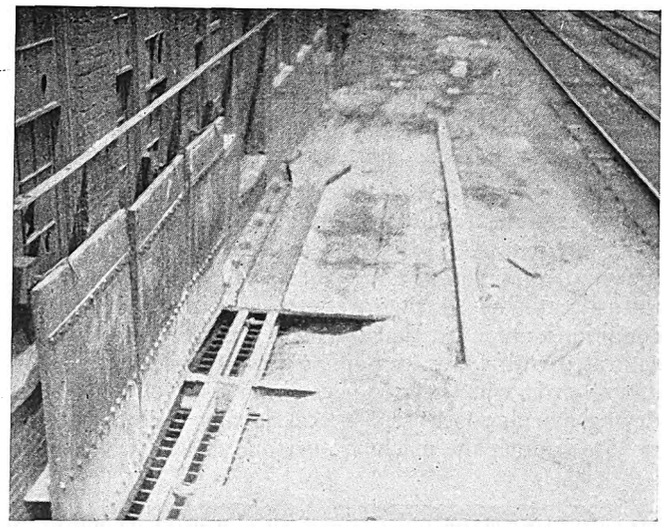
Temperatures of the gases as they pass into the outer sand chamber are greatly reduced so that overheating of the sand as it discharges is held at a minimum. This further tends to keep the moist steam away from the discharge end of the drum, preventing any possible after-mixing should the gases become oversaturated.

Control of the amount of gas required to dry sands of varying moisture content is obtained by a Bristol electric thermostat. The sensitive bulb of the thermostat is located in the path of the moist gases just before they enter the blower housing. This bulb is connected to a temperature indicator which in turn operates a solenoid valve on the gas line. By experimentation, a temperature of 190 deg. Fahrenheit at that point of the passage was found to be sufficient to carry away all the moisture without allowing it to condense in the dust catcher.

If the drum should stop rotating, the gas would automatically burn more slowly as the temperature rises in the chamber. An extra precaution against overheating the brick oven and cylinder shell is taken care of by connecting the solenoid in parallel with the motor that operates the wet sand elevator. If for any reason this motor should stop, the gas is immediately shut off. It is further evident that this thermostatic arrangement insures efficient economy of gas with practically no attention from the operator.

The necessity for reducing labor as much as possible in handling the sand made necessary careful layout and designs of storage and conveying machinery. The old sand room of the Rankin carhouse was chosen because of its convenient location near a source of supply. In back of the carhouse the ground is 13 ft. higher than the track floor inside of the building. The old sand drying stoves formerly stood on a second floor located in this portion of the building. Holes were cut in the walls and chutes were made to slide the sand into a 50-ton bin on the track floor. To get a desirable slope to the chutes, it was necessary to build a ramp 2 or 3 ft. high on which the trucks back up to dump. The doors covering the chutes were reinforced with I-beams so that the truck could back over them to the empty portion of the bins.

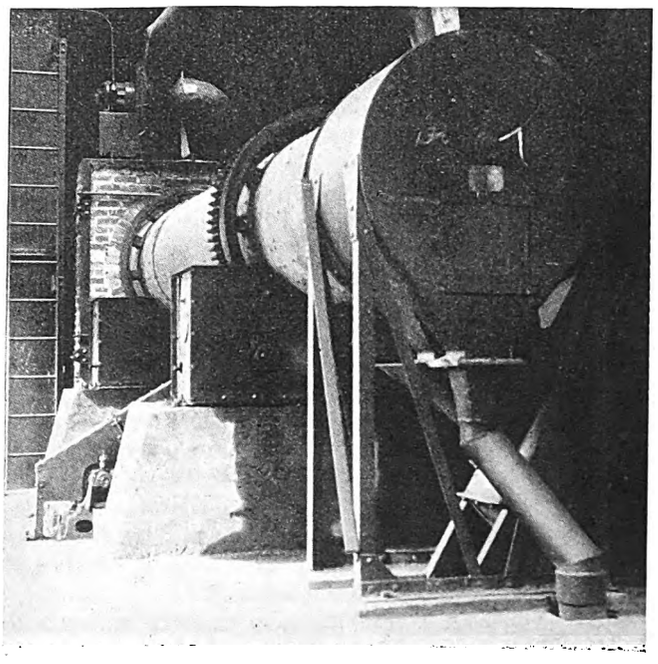
The wet sand falls out through openings in the bottom of the bin onto a conveyor belt. Six especially designed sliding gates on roller bearing wheels close and open the holes as desired. Above each gate, small poke holes



Ramp, chute and covers where wet sand is dumped from motor trucks

were cut out to break up any arching effect of the wet sand over the opening. This arching characteristic of wet sand was considered carefully in the design of the bin, but it has been found necessary to station a man to watch the conveyor almost continually in order to break up the arch when the sand stops running.

The conveyor belt is propelled by a three-speed motor so that by varying the speed of the belt, the rate of feeding can be controlled according to the wetness of the sand. A vertical conveyor lifts the wet sand up to the roof where it then falls through a pipe to the drying machine. Another vertical conveyor carries the dry sand from the discharge hopper to the ceiling, where it falls through spouts to the storage area of the floor. Holes were cut through the storage floor, and chutes with gates were attached for loading the cars on the track floor below. Electrical switches controlling the motors for the fan, drum and all conveyors, are interconnected, so that if any motor in the line should stop, all motors on



Closer view of the dryer drum and oven wall. The drum is lined with batten plates and tilted slightly to aid in moving the sand through its length

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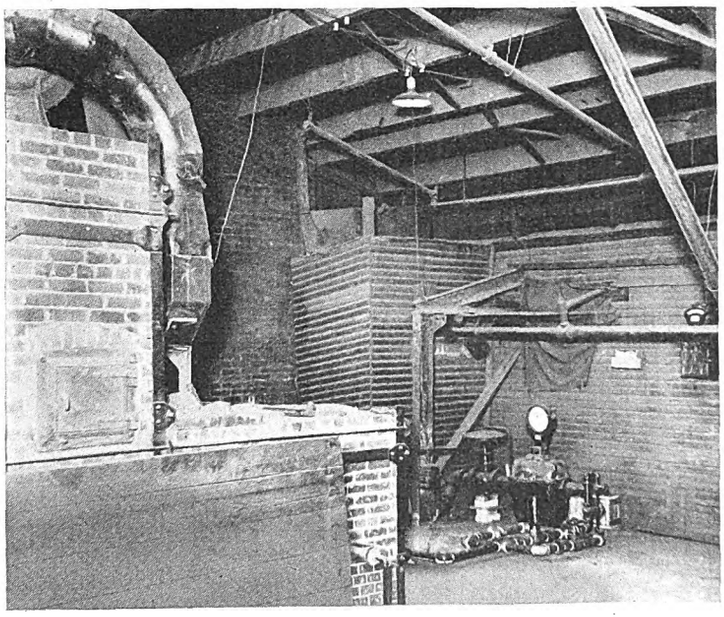
preceding operations would automatically shut off, preventing any dangerous overcrowding of the crippled unit.

The dryer has a rated hourly capacity of drying 7 tons of sand having an initial moisture content of 6 per cent. Practically all the sand used around Pittsburgh is dredged out of the river and delivered with upwards of 10 per cent moisture. The capacity of the fan to draw only a definite amount of hot gases through the drum limits the output to between 4 and 6 tons per hour when the sand contains more moisture than 6 per cent. It is unfortunate that during wet or icy weather when rail conditions are exceptionally bad, the sand is delivered saturated with water, containing frozen pieces of ice. In other words, when sand is needed most, the output of the drying machine is least. It occasionally is found necessary to operate the machine overtime due to this inverse ratio of operating conditions. An extra large storage for the dry sand helps to prevent overtime operating expenses.

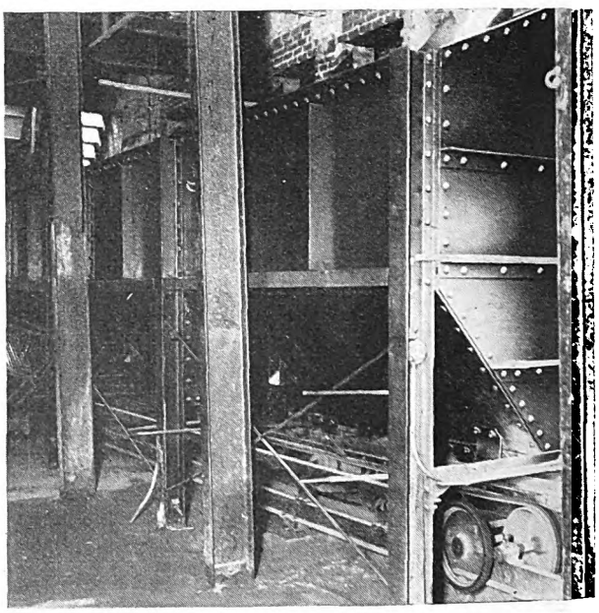
Labor costs for the actual drying work have been greatly reduced. Where, heretofore twelve men were required the work is now being done with four men. Two operators are required on the machine and two of the old plants are still being operated to take care of peak loads and emergencies. This saving of labor is somewhat offset by the cost of transporting the dry sand about the system. Running time to the various carhouses is anywhere from 30 minutes to 1½ hours. Gondola cars are used mostly, requiring two men to operate them. Unloading at the storage bins of the carhouses is done by hand and takes about two hours. It would be liberal to estimate an average transportation cost of 60 cents per ton. A tank sand car is now under construction that will unload by means of compressed air. One or two large automatically controlled storage bins will be built at strategic points to do away with all the small sand houses, which will cut the transportation costs considerably.

Cost of dry sand with the new machine amounts to about 60 cents a ton. Transportation costs increase this item to about $1.20 per ton to make conditions comparable to the old stove drying system. The drying costs can be divided in per ton units as follows: 8 cents for 150 cu.ft. of gas at 5 cents per 100; 26 cents for labor of two men, at about $3,000 per year, drying 11,000 tons; 23 cents for interest, taxes and depreciation at 20 per cent of $14,028, the cost of the dryer and auxiliary equipment; and 3 cents for power at 1.5 cents per kilowatt. Records of cost by the old stove system averaged about $1.81 per ton. The entire cost of plant with building alteration and extras amounted to about $17,500. With a saving, as shown, of 61 cents a ton on a yearly quantity of 11,000 tons used, the total saving would be $6,710 per year. It would therefore take about 2½ years to pay for the plant.

There are many other advantages, however. More favorable purchasing contracts can be made as one sand company will bid on the entire quantity and make allowances for dumping. Automatic controls and conveying machinery get highest efficiency from fuel and energy, which makes for a more uniform dryness. Concentration of floor space makes available additional car storage areas at the various carhouses. Handling of coal and ashes is eliminated along with the smoke nuisance that was associated with the old stoves. In brief, the company is well satisfied with the sand drying machine.



Fire end of the automatic sand dryer showing one of six high-pressure gas burners, the Bristol thermostat and the solenoid valve



Wet sand bin with a capacity of 50 tons, located on the ground floor

Work Cards Promote Efficiency

EACH carhouse mechanic on the system of the Los Angeles Railway is furnished a "Work Card" on which he sets down the time, correct to the nearest five minutes, which is spent on each separate job to which he is assigned during the day, the time being segregated by numbers into various major accounts. The foreman or anyone acting in a supervisory capacity may ask a mechanic for his work card at any time and learn from it exactly what he has done that day and how long it took him to do it. The work cards are turned into the foreman's office at the conclusion of the working day and are used in preparing the accounts. It has been found that the psychological effect upon the workman of recording the time required to perform a definite piece of work tends to improve efficiency, as the men take pride in doing the work in the shortest possible time.

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Keeping Proper

Bus Depreciation Accounts

Detailed cost accounting eliminates the unsatisfactory estimating, or rather guessing, of the "fair life" of a bus and gives a sound economic basis for retiring equipment

By H. E. Jordan

Assistant Engineer Los Angeles Railway, Los Angeles, Cal.

BUS expenses are classified as transportation, fuel and lubrication, maintenance, general administrative expense and depreciation. The wages of the drivers and conductors, the cost of fuel, the cost of repairs, and the general administrative costs are expenses that may definitely be summed up at the end of any month, and any item included in that summary may be traced down to the purchase of a definite amount of material, the efforts of an individual, or the specific items of taxes and insurance. However, bus depreciation, which averages between 20 and 25 per cent of the total operating cost, is not definite.

Few operating companies have a detailed cost accounting system that is sufficiently complete to enable them to make a thorough analysis of their operations. When an analysis is attempted, usually the mechanical superintendent and the master mechanic are the first to be "hauled upon the carpet," and sundry proposals are made whereby the maintenance may be reduced. To be sure, this may offer many possibilities for increased economies. However, the net savings effected from proposed changes pertaining to the maintenance of the buses is seldom satisfying because the cost accounting system has not been developed to show accurately the resultant cost reduction, if any has been obtained. Since the total maintenance cost, exclusive of tires, is approximately 10 per cent of the total operating cost per bus-mile, a relatively large reduction in maintenance could only make a small reduction in the total expense.

Several Accounts Offer Cost Reduction Possibilities

The fuel and lubricating accounts are not considered to the extent they deserve. They represent about 9 per cent of the total operating cost and there should be many possibilities in them for reducing costs. Gasoline motors, driving gears and other units in buses have been developed to a high degree, but there should be opportunities for further improvements in their design that would lower the fuel consumption and the amount of lubrication necessary.

Operators' wages and other transportation expenses, approximately 31 per cent of the total, are not considered, as buses must have drivers and the rate of pay is not very flexible. The transportation expenses, therefore, are usually considered as inflexible charges and given little consideration in a study for cost reduction, unless the service is to be reduced. A reduction in service is seldom made as there is almost always a demand for not only bigger buses, but also more of them.

Insurance, taxes and general administrative expenses are also regarded as inflexible charges. Finally, the management in its analysis of expenses arrives at the equipment depreciation account. It represents approximately 23 per cent of the total operating expenses and is consequently a real temptation, but its indefinite nature makes it an elusive account. The mechanical men think in terms of physical life, the operating men in terms of obsolescence, the auditing men in terms of financial life, and the result is that an uncertain conclusion is drawn that the average life of a motor bus is five years.

Many Factors Cause Misconception of Depreciation

Ordinary laymen in the transportation industry think of the setting up of a depreciation reserve fund as the process of setting aside money over a period of time from the gross revenue, in sufficient amounts to enable the operator to purchase new equipment when the equipment that is being used wears out. It is based upon the original cost of the equipment and the length of time the equipment is to be used.

Public utility regulatory bodies have specified rules that allow the utilities to set up depreciation reserve funds on units of equipment that have relatively long life. The rules state that the amount set aside shall be based upon the original cost of the unit when installed, and the rate of setting it aside shall be based upon a "fair life" for the equipment. The amounts are set aside through depreciation and depreciation reserve accounts.

Regulatory bodies also have specified rules that wearing parts of any particular major unit of equipment may be renewed through the maintenance accounts. Although maintenance accounts and depreciation accounts are both classed as operating accounts, and as such are deductible from the gross revenue, they are considered as two distinct groups and are so classified.

Relation of Maintenance To "Fair Life"

If the rate of depreciation is to be based upon the "fair life" of any unit, it is important that there be a correct understanding of the term "fair life." If the "fair life" of a bus is to be based upon its physical condition, then it is essential that the maintenance be considered, because each time a worn or defective part of the bus is replaced its physical condition is bettered

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and its life is prolonged. Since it is possible to replace any part of a bus, its physical life may be prolonged indefinitely. It is evident then, that the "fair life" of a bus cannot be gaged entirely from the physical condition over any definite period if renewals of defective parts are to be made whenever they are needed.

Danger in "Obsolescence" Determination

If the "fair life" of a bus is to be based entirely upon obsolescence, then the assumption must be made that at the end of a fixed period of time the bus will be obsolete. Not considering maintenance this might be a very satisfactory basis for depreciation, except that the word "obsolete" is too abstract. Development in equipment design and changes in service for each particular company cannot be foreseen accurately. Two competent and experienced parties might disagree on the time a bus is obsolete, and yet both parties will have sound reasons for their respective viewpoints. These opinions may vary as much as two or three years on the life of a particular bus or type of bus. When such wide differences of opinion are possible as to when a bus is obsolete, it is evident that obsolescence alone is not a satisfactory basis for establishing "fair life." If a bus were a single unit of equipment, time and experience would soon determine a definite life for it. However, a bus is not a single unit; it is an assembly of a large number of small units that differ in size, shape, structure and in wearing life. There is no established uniform relation between the wearing life of the different units that make up a bus, and much less between different models and makes of buses now being used.

Suppose renewals of units within a bus were made from time to time and charged to the maintenance account and no change was made in the capital or depreciation account. Consider the two following examples to see what the result in each case would be:

First, suppose a bearing becomes worn and it is replaced. Regardless of whether or not the new bearing costs the same as the one it replaced, the transaction will be considered a "replacement in kind" and charged to the maintenance account, in accordance with the rulings of the regulatory body. The new bearing, no doubt, will be similar in every respect to the bearing replaced and will carry the same specifications and identification. Therefore, no charge will be necessary on the property ledger, or in the capital and depreciation accounts, as the charges and credit have been cleared through the maintenance accounts.

Renewals Should Not Be Charged to Maintenance Accounts

Second, suppose the driving gear, body, chassis and accessories of a bus have given satisfactory service and are still in good condition, but the motor is defective and has been a constant source of trouble. Suppose further that a different make of motor is bought to replace the defective one. Usually the bus has been treated as a single unit of equipment and a depreciation reserve fund has been set up accordingly. Therefore, from the accounting viewpoint, it may appear easier to consider the motor replacement a similar transaction to the bearing replacement, a "replacement in kind," or, in other words, strictly a maintenance expense, and not disturb the property ledger. However, regardless of the relative cost of the two motors, the new motor is a different make from the motor replaced and will, therefore, have different specifications and identification. The result will be a different bus or unit of equipment than that carried on the property ledger and in the capital accounts for the original bus.

Buses have been universally used as transportation units a comparatively short time, and experience is fast indicating that there is nowhere near a balanced relation of the lives of their major parts. The body may become loose or obsolete long before the chassis and motor have ceased to give satisfactory service, or the motor may prove inadequate and have to be replaced while the body and chassis are still satisfactory. Therefore, the identity of the bus will change from time to time as the circumstances may warrant. If each major change is not followed by the proper change in property ledger and capital accounts, the result will be that after a few years the property ledger and capital account will not reflect the actual field conditions. It is ridiculous to imagine that changes and alterations are not going to be made to buses that will materially change their identity. It is impossible to foresee the development of bus equipment design and the changing service demand to dispose economically of each bus as a complete unit without having changed its identity during its operating life.

It is certainly the duty of the auditing department of every company to have its books represent the facts as accurately as possible. It is essential, therefore, that whenever a physical change affects the identification of a unit the books be changed accordingly. If it is desirable to consider an entire bus as a unit of equipment and set up depreciation upon it as such, then each time its specifications are changed the original unit should be struck off the capital accounts with proper charges and credits to both the capital and depreciation reserve accounts. The new unit with its identity should then be charged to the proper capital account and its life estimated to determine the proper rate of depreciation.

Definite Determination of "Fair Life" of a Bus

The most satisfactory basis for determining the "fair life" of a bus or any unit of equipment made up of a large number of small units, each of a different wearing life, is to find that point in the life of the major unit when the difference in maintenance between the old unit and the new unit, less the difference in rates of depreciation, is equal to the interest on the new investment, namely, the cost of the new unit.

If the operating company keeps an accurate detailed cost accounting system of operation cost per bus-mile, it will show that the maintenance cost will gradually increase for several years until a maximum is reached. The cost will probably stay at that maximum indefinitely, because every time a part becomes defective it will be replaced until finally no perishable part of the original bus will be left. However, it is very probable that before the peak of the maintenance curve is reached, the management will determine that the higher cost of maintaining and operating the old bus over that of a new bus will justify its replacement.

A detailed cost accounting system greatly reduces the necessity of the unsatisfactory guesswork of estimating the "fair life" of a bus and gives a sound economic basis for the retirement of the equipment. A system of this kind has been worked out and is in successful operation by some companies. It can be developed on any transportation system without excessive cost and will many times pay for the expense of its installation and maintenance by picturing true conditions to the management so that its judgment may be sound and accurate.

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Transportation Improvements

Recommended for Milwaukee

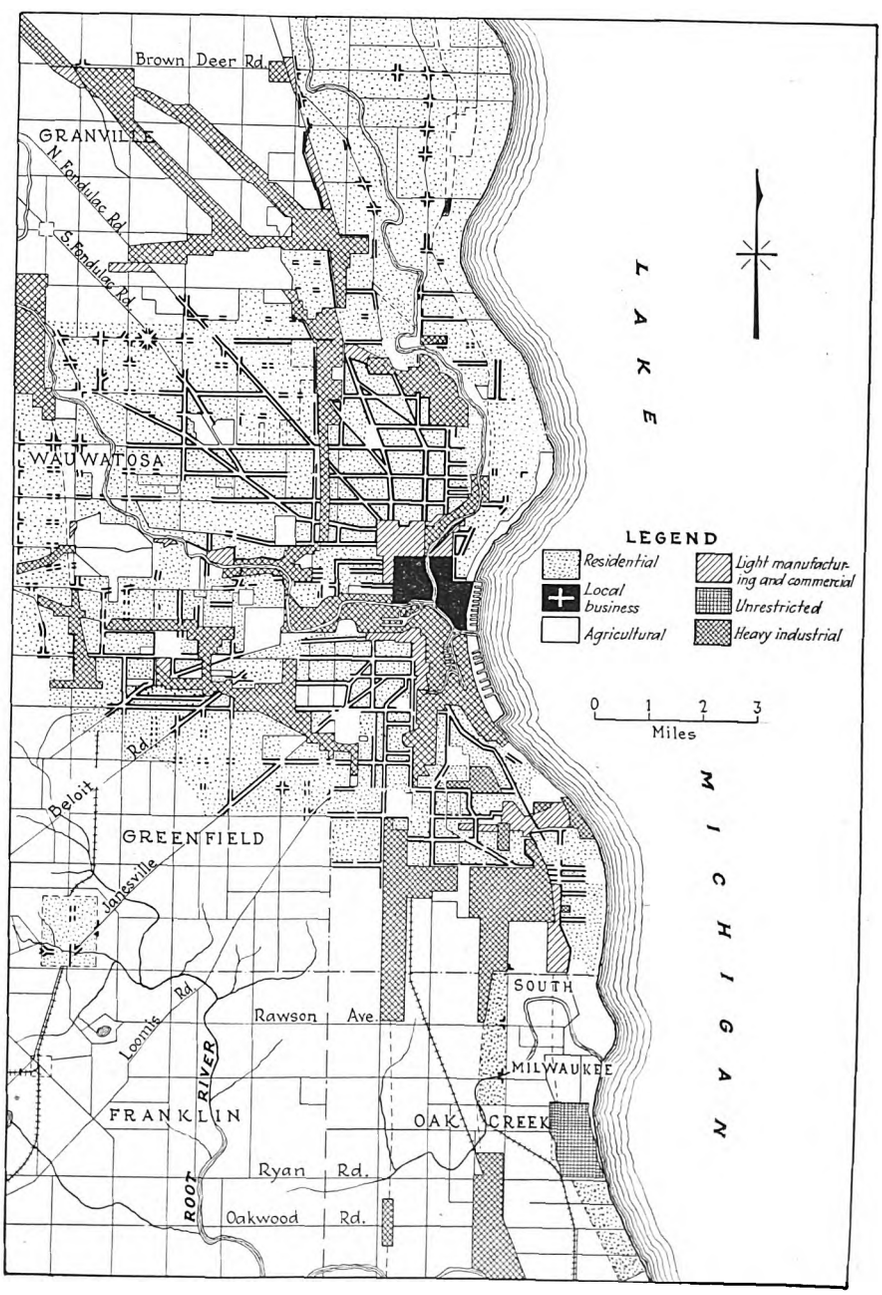
Survey by McClellan & Junkersfeld, Inc., included study of the relation between transportation and general community development. Recommendations were based on an analysis of travel routes of street railway and bus passengers and other vehicles

SECOND ARTICLE

Street widening, arterial highways, rapid transit expansion, semi-rapid surface lines, parking restrictions, improved traffic signals and special traffic routes for trucks were recommendations contained in the first article on the Milwaukee Transportation Survey, published last week. This concluding article contains a digest of the basic facts from which the recommendations were drawn.—EDITOR.

NOT only were direct checks of the use made of transportation facilities included in the Milwaukee transportation survey, but the general plan was far more general in that it embraced other phases of the city's development and planning which affect its transportation requirements. The field work covered a period of several months, so that data could be collected for various seasons of the year. The report consists of two volumes, the first containing text matter, and the second supporting data. One entire chapter is devoted to an analysis of the economic relation between transportation and general community development, including its effect on the value of land and property.

The geographical and topographical features of Milwaukee directly affect its traffic problem. The city is roughly semi-circular in area, limited on the east by the concave shore line of Lake Michigan and extending therefrom about 5 miles westward and an equal distance north and south from its business center, which is relatively close to the lake front. About half a mile inland from the lake front and roughly parallel to it the Milwaukee River flows through the business center of the city from the north. The Kinnickinnic River enters from the south and joins the Milwaukee River near its mouth. In addition to these two streams, the Menominee River, with a relatively



Milwaukee's transportation problem arises from the need for moving a heavy industrial population during short peak periods. Few crosstown lines are available between residential and business districts shown on this zoning map of Milwaukee County

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deep valley ¾ mile wide, enters the city from the west and joins the Milwaukee River about ⅝ mile from its mouth. The trend of population distribution is shown in the following table, which includes forecasts for 1940 and 1960.

The topographical features of the city, coupled with the wide distribution area of population, results in heavy traffic flow to the central business district from all parts of the city and through the central business district from one outlying district to another. This latter is the result of the development of travel routes connecting each of the outlying districts with the center of the city without proportionate development of direct routes, because of the high cost of north-and-south routes across the Menominee Valley. Such routes as have been developed have required long and high viaducts entailing large expense. The Menominee River valley has been improved with wharves and docks and the stream made navigable half way across the city necessitating movable spans in the viaducts. Development of north-and-south traffic routes west of the navigable portion of this stream has the alternative of low-level routes across the valley, or viaduct construction without movable bridges. There is now heavy north-and-south traffic for which there are but few routes and, according to the report, this traffic will undoubtedly increase rapidly in the future.

DISTRIBUTION OF POPULATION OF MILWAUKEE FROM BUSINESS CENTER,
Third Street and Wisconsin Avenue, 1880-1960

Zone	Per Cent Living Within Various Mile Zones					
	1880	1900	1920	1926	1940*	1960*
1 mile	34.0	16.8	12.4	7.9	5.1	2.5
2 miles	33.6	41.7	31.5	26.5	22.3	11.6
3 miles	17.4	30.8	36.5	33.6	25.0	18.4
4 miles	9.4	6.5	12.7	14.5	17.9	21.3
5 miles	4.0	2.5	4.6	7.0	9.9	16.4
Over 5 miles	1.6	1.7	2.3	10.5	19.8	29.8
*Estimated.	100.0	100.0	100.0	100.0	100.0	100.0

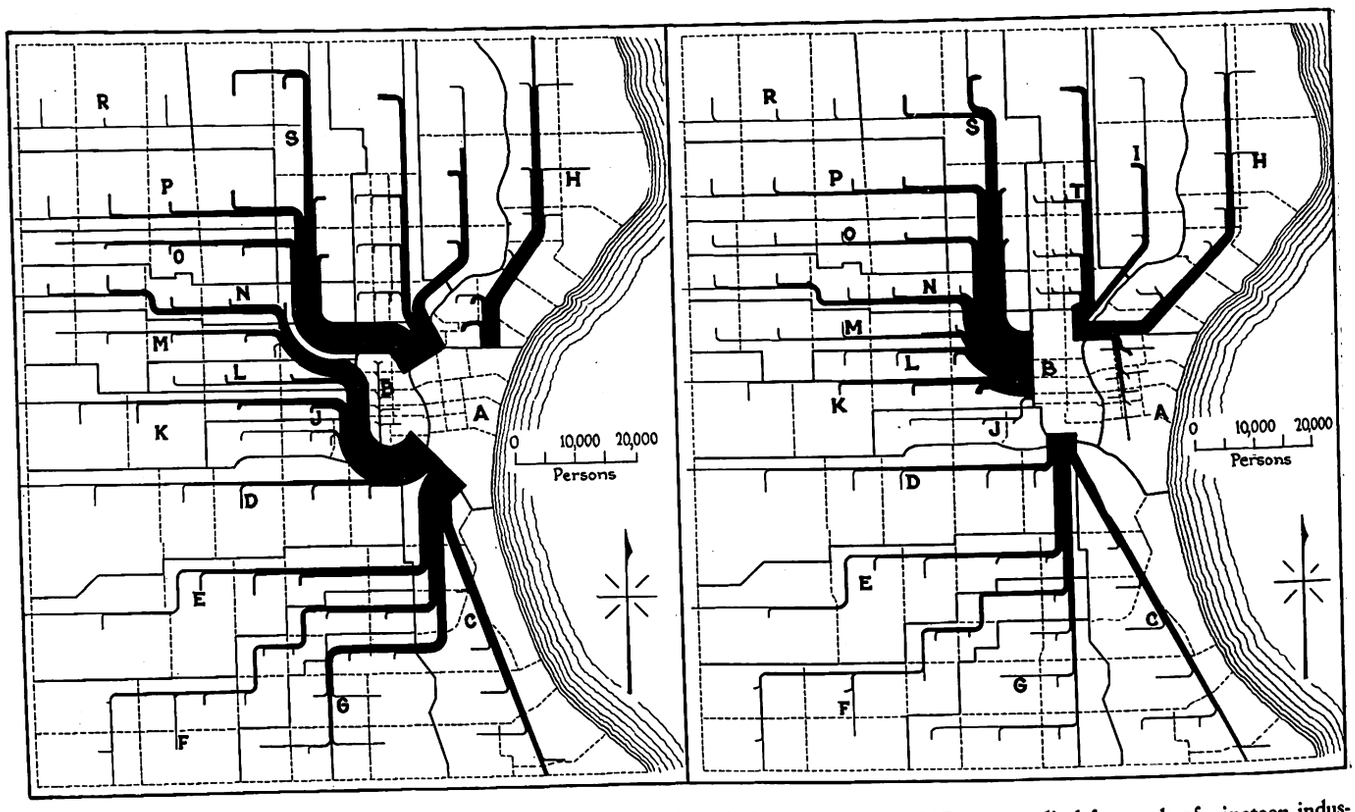
The city is served principally by the Chicago, Milwaukee, St. Paul & Pacific and the Chicago & North-Western railroads. The Grand Trunk, Pere Marquette, and Soo Line railroads and three interurban electric railways also serve Milwaukee. The main railway stations and freight depots are within the central part of the city but on opposite sides of the Milwaukee River. Small outlying depots have been located within manufacturing districts which have grown up at some distance from the business center.

Requirements of Metropolitan Area Studied

The population of Milwaukee, as estimated by the engineers, is 519,000 within the city limits. The Milwaukee metropolitan district, which roughly includes all of the area in Milwaukee County has a population of more than 640,000. The relatively high concentration of population indicates the nature of the transportation problem. The density of population in Milwaukee is 15,300 per square mile and the area within the city is 34 square miles. The population densities in Cincinnati, Kansas City and Buffalo, which have approximately the same total population, are 5,800, 5,400 and 2,900 per square mile, respectively. Only in cities of considerably more than a million population are densities found greater than that in Milwaukee.

Zoning in the city is shown in an accompanying map. This indicates the relatively large area devoted to commercial, light manufacturing, and heavy industrial use. Milwaukee is inherently an industrial city and its growth (approximately 10,000 per year) is almost entirely attributable to the expansion of its diversified industries.

The report introduces statistics compiled by the First Wisconsin National Bank which show that 133,000 persons are employed in the city. This is a higher proportion of total population than is usually found, and affects.



Source and volume of employed population movement on a typical week day in January, 1927, was studied for each of nineteen industrial districts into which the city was divided. These typical flow diagrams show the movement of passengers into the two sections of the central employment district. On the left the section east of the Milwaukee River, on the right the western section

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the traffic problem by producing heavy peaks in transportation requirements and in the demand on public transportation facilities. Transportation habits and requirements in the city were obtained from questionnaires distributed to the employed population. More than 127,000 usable cards were returned from the 133,000 employed persons, or a coverage of more than 95 per cent. The card form used is shown in an accompanying illustration. A similar questionnaire was distributed among students to determine the overlapping of their transportation requirements upon those of the employed population. The extent of this dual demand during the morning peak is indicated in an accompanying chart.

EMPLOYMENT BY DISTRICTS AND MOVEMENT OF EMPLOYED PERSONS BETWEEN RESIDENCE AND PLACE OF BUSINESS

Location of Residence	Location of Employment: Central Business District	South Side	East Side	North and West Sides	Total
Central business district	3,772	1,048	202	1,267	6,289
South side	11,683	27,227	307	5,077	44,294
Upper east side	5,503	878	1,259	1,701	9,341
North and west sides	28,801	9,331	1,956	26,493	66,581
Outside county	216	148	8	151	523
Total employed	49,975	38,632	3,732	34,689	127,028

For purposes of analysis the city and county were divided into 181 districts. These were in turn grouped according to business and industry and lines of traffic flow into nineteen "employment districts." These districts and sections are shown in an accompanying illustration which also shows traffic flow diagrams for the two parts of the central business district on either side of the Milwaukee River. Similar charts were used in the study of transportation requirements for each of the other seventeen employment districts.

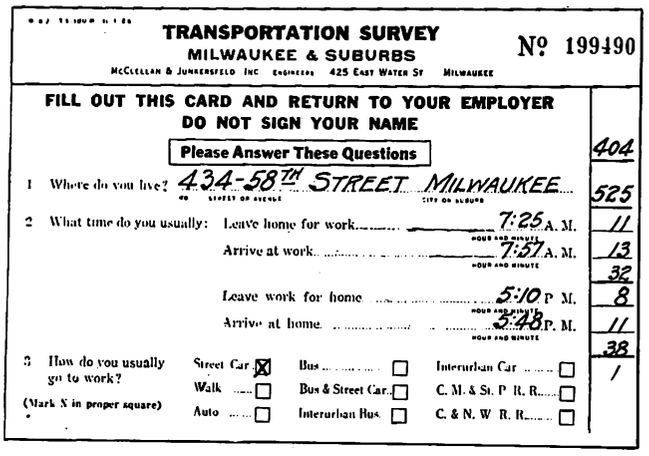
That Milwaukee depends principally upon street cars for transportation is indicated by the following tabulation of questionnaire results:

	Number of Persons	Per Cent of Total
Street car	69,056	54.5
Bus	1,557	1.2
Bus and street car	4,468	3.5
Interurban car	2,069	1.6
Interurban bus	61	Less than 0.1
Steam railroad	140	0.1
Total public transportation facilities	77,351	60.9
Private automobile	15,298	12.0
Walking	34,166	26.9
Miscellaneous	213	0.2
Total—all facilities	127,028	100.0

Among other analyses made of questionnaire returns was one to determine the travel methods according to distance between places of residence and employment. The results are shown in an accompanying chart.

Routes Converge in Business District

Due to the manner of growth and the concentration of business within the relatively small area of the central business district and also due to the topography, most of the public transportation lines enter this district. It is significant that more than 40 per cent of the total working population is employed in it. Few reside either within the district itself or sufficiently close to walk to and from work. In addition to the traffic movement of the population employed in the central district, the natural terrain and location of routes cause many persons to be transported through it to other centers. The relation of place of residence to place of employment is


TRANSPORTATION SURVEY
MILWAUKEE & SUBURBS
McCLELLAN & JUNKERSFELD INC ENGINEERS 425 EAST WATER ST MILWAUKEE
Nº 199490

FILL OUT THIS CARD AND RETURN TO YOUR EMPLOYER
DO NOT SIGN YOUR NAME

Please Answer These Questions

404

1 Where do you live? 434-58TH STREET MILWAUKEE (NO. STREET OR AVENUE / CITY OR SUBURB) 525

2 What time do you usually: Leave home for work 7:25 A.M. (HOUR AND MINUTE) 11
Arrive at work 7:57 A.M. 13
32
Leave work for home 5:10 P.M. 8
Arrive at home 5:48 P.M. 11
38

3 How do you usually go to work? (Mark X in proper square)
Street Car [X] Bus [ ] Interurban Car [ ] 1
Walk [ ] Bus & Street Car [ ] C. M. & St. P. R. R. [ ]
Auto [ ] Interurban Bus [ ] C. & N. W. R. R. [ ]

Detailed studies were made of approximately 95 per cent of Milwaukee's rush-hour traffic, from information collected on this simple questionnaire form

indicated in an accompanying table, in which, for convenience, the city has been divided into four parts and the working population from outside the county is shown separately.

This table indicates three major daily population movements, namely:

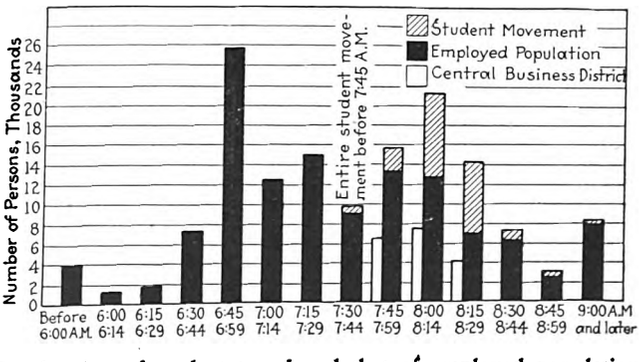
28,800 persons work in the central business district and live on the north and west sides,
27,200 persons work and live on the south side,
26,500 persons work and live on the north and west sides.

City Well Covered by Transportation Lines

Of the total city area only 2.14 square miles, or 6 per cent, is more than one-quarter mile from an existing car or bus line, this proportion being less than that found in any of the several typical American cities of approximately the same size which were visited by the Milwaukee transportation survey committee in 1927. The average of these cities was 22.5 per cent. A study made of the traveling time required to reach the central business district from various sections of the city indicates that during rush hours the time required for this trip is increased from 10 to 15 per cent over non-rush hours.

Transportation in the Milwaukee district is under the supervision of the Wisconsin Railroad Commission, which has prescribed certain standards of service, briefly as follows:

During rush periods cars operated two-man must furnish 67 seats for each 100 passengers at the maximum load point, and one-man cars must furnish 80 seats per 100 passengers. During non-rush periods from 110 to 133 seats per 100 passengers must be furnished, the ratio varying with the load on individual lines, unless headway governs.



Overlapping of student travel and that of employed population increases difficulty of public transportation in Milwaukee. In this chart the student movement is superimposed on employee movement according to time of arrival at school or work

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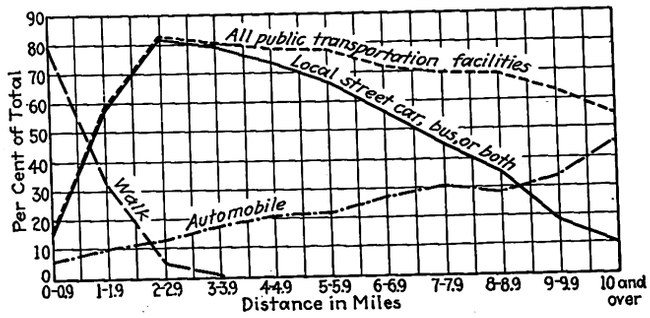


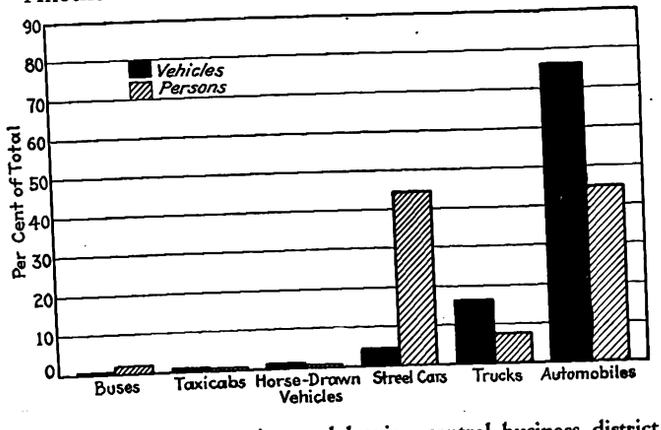
Use of various travel facilities by 127,028 employed persons on a typical week day in January, 1927, was plotted graphically to show the relative importance of each facility and the influence of distance between home and work upon the choice of transportation

A comparison of these standards of service with those specified in other typical American cities shows that requirements for Milwaukee are in general more stringent.

About 160,000 transfer passengers are handled on the lines of the Milwaukee Electric Railway & Light Company on a typical week day and the annual ratio of transfer to revenue passengers is 41.4 per cent for the entire system. On certain crosstown lines, which are essentially distributing lines, this ratio is as high as 60 or 70 per cent. A geographical analysis shows that of all transfer interchange 32.0 per cent is in the central business district; 44.3 per cent on the north and west sides; 19.4 per cent on the south side; 4.3 per cent on the upper east side. Extreme concentration of transfer interchange was found at certain points, particularly along Third Street between Michigan and Center Streets, where 16 per cent of all transfer movements in the entire city take place at seven intersections.

The general practice in the past has been for the bulk of the street railway lines in Milwaukee to be through-routed either from the north to south side of the city or from the east to west. A special study was made to determine the proportion of through passengers on these various lines to see whether such routing was justified and whether traffic was properly balanced. This number was found to be slightly more than 20 per cent of the total traffic within the downtown district and but 9.2 per cent of the total traffic throughout their length. This indicated that the volume of through traffic was not sufficient to be a determining factor in any rerouting which might be justified on the basis of other considerations.

Another detailed study was made of the distance between stops and the relation between the total number on each line and the actual number of stops made. This showed that the average distance between stopping places on the entire system is 590 ft., ranging from an average of 420 ft. in the downtown district to 610 ft. in the residential section. Computations including the time required to walk to car stops and the actual running time of the car as influenced by the number of stops, indicated that the minimum traveling time from home to the downtown district could be secured with an average distance between actual stops of 1,125 ft. Further study showed that on the average stops were made at 75 per cent of the scheduled stopping places during rush periods so that, adjusting for this ratio, the scheduled stopping places should be located 850 ft. apart to give an average distance between actual stops of 1,125 ft.



All the street cars entering and leaving central business district of Milwaukee on a typical week day amounted to less than 5 per cent of the total number of vehicles. More than 75 per cent of this vehicular movement was automobiles. The total persons carried, however, were approximately the same; namely, 45 per cent in street cars and 45 per cent in automobiles

An analysis of time required for passenger interchange was made from some 120,000 stop-watch observations The results follow:

	Loading Time in Per Cent of Total Trip Time		
	All Lines	Maximum	Minimum
Inbound:			
Morning rush	18.5	28.5	12.3
Evening rush	15.3	19.1	6.3
Morning, afternoon and evening non-rush	14.0	18.5	8.4
Night non-rush	9.3	14.4	4.2
Outbound:			
Evening rush	18.4	24.1	11.8
Morning rush	13.6	17.3	8.3
Morning, afternoon and evening non-rush	12.7	16.7	8.2
Night non-rush	10.7	15.8	4.5

The similarity in ratio of time required for boarding and alighting during rush-hour trips in the controlling direction is striking. More than 18 per cent of the total trip time is consumed in this manner. Further amplification of this particular study shows that at the principal downtown intersections 62.6 per cent of the total standing time during the afternoon rush was spent in loading or unloading passengers, whereas 37.4 per cent was due to delays on account of other traffic.

An interesting aspect of the legal restrictions on speed of street cars in Milwaukee disclosed by the report is that prior to 1927, it was illegal for street cars to exceed a speed of 15 m.p.h. In 1927, this was increased to 20 m.p.h. in residential and business districts and 25 m.p.h. elsewhere. An extended study which covered the extent and frequency of various factors causing delays in street railway service, was made by the Milwaukee Electric Railway & Light Company in 1926, and analyzed in the preparation of the report. This study showed that, in the year 1926, of more than 69,000 delays of five or more minutes, 68.3 per cent were from street traffic and resulting congestion, 6.3 per cent from bridge openings, 5.9 per cent from defective equipment and 19.5 per cent from all other causes. The detailed analysis for the Twelfth Street Line is shown in the table above.

CAUSE OF DELAY (TWELFTH STREET LINE)	Per Cent of Total Delay Time
Traffic interference due to parking, inability to enter loading zone, pedestrian travel, and waiting for traffic signals	41.1
Street car ahead	17.0
Trainmen's duties	14.0
Difficulties with equipment, including lights out, power off and minor defects	10.0
Automobiles and trucks on track	5.8
Stops at railroad crossings and due to bridge openings	5.8
Reduced speed due to traffic congestion, other vehicles moving in track zone, etc.	4.2
Trolley off	1.3
Switching	0.8

It was found that for the entire railway system 30.2 per cent of the cars were on time at maximum load

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points, 20.5 per cent were one minute ahead of schedule and 12.6 per cent were one minute behind schedule. Of the total cars 14.4 per cent were two minutes or more ahead of schedule and 22.3 per cent were two minutes or more late.

Cordon counts of all vehicles, including street cars, entering and leaving the central business district during a typical week day showed that the total traffic amounted to 189,000 vehicles in both directions, carrying 539,000 passengers. These were distributed as follows:

	Average Passengers per Vehicle	Per Cent of Total Vehicles	Per Cent of Total Passengers
Automobiles	1.7	76.6	44.9
Street cars	29.3	4.3	44.6
Buses	11.4	0.5	2.0

The distribution of this traffic by type of vehicle and passengers carried by each type is shown in an accompanying chart. A similar cordon count was made over the Labor Day week end on the outskirts of the city to ascertain the maximum use of highways entering the city.

Parking Regulations Not Enforced

Special checks were made to determine the degree of enforcement of parking regulations. It was found that out of 2,319 cars checked, 585 or more than 25 per cent violated the ordinance, this ratio running as high as 43 per cent in certain blocks. This study was extended to determine the available parking capacity in streets and in private parking places and garages in the downtown district. It was found that approximately 65 per cent of the parking space in the streets and 60 per cent of the space in private parking places and garages was occupied during the day.

Studies of conditions affecting traffic movement included street widths, speeds of vehicles, interference at intersections, traffic regulation, steam and interurban railroad grade crossings, river bridge openings and terminal movements of interurban cars and buses. The railroad grade crossings and river bridge openings are causes of considerable traffic delay in Milwaukee because of the topography of the city and the presence of three navigable rivers, one of which passes through the center of the downtown business district. The railroad crossing situation is being relieved gradually by grade separations. A separate study was made for the Board of Harbor Commissioners of Milwaukee, dealing with the possibility of reducing or eliminating bridge delays.

In Milwaukee, the base street railway fare on lines of the Milwaukee Electric Railway & Light Company is 7 cents and on the two other street railway lines operating in the city it is 5 cents. The report contains an analysis of costs of various means of transportation estimated for an average 4-mile ride, taken twice a day. A summary of this follows:

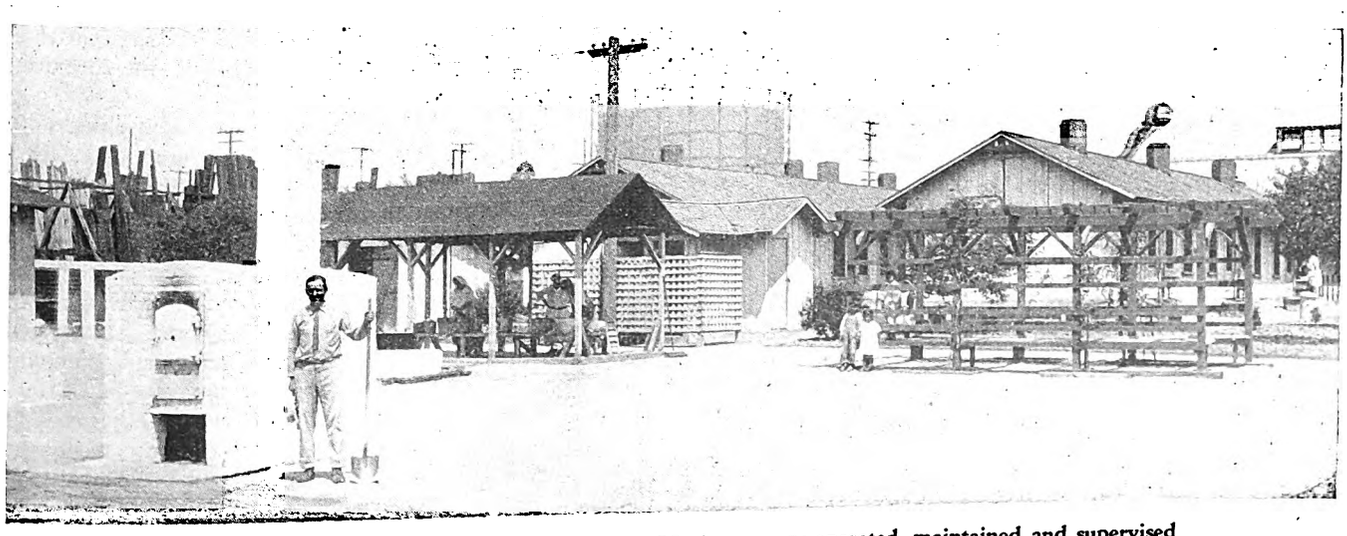
	Cost per Day
Street car—ticket fare	12.5 cents
Cash fare	14.0 cents
Private automobile—variable costs only ($500 automobile)	18.4 cents
"Seat per passenger" bus	20.0 cents
Private automobile—variable costs only ($1,500 automobile)	28.0 cents
Taxicab	$2.90

The report includes a study allocating the various operating expenses of the Milwaukee Electric Railway & Light Company between fixed and variable expenses. From this, the length of haul which under present traffic conditions and rates of fare would yield a 7½ per cent return on the established rate base of the company, was computed. This showed that the average ride for which the present rate of fare is compensatory is 3.1 miles, whereas the present actual average length of ride is 3.8 miles.

Handling Mexican Labor in California

By Paul T. Porter
Los Angeles, Cal.

PRESENCE of the Mexican immigrant is a problem of the great Southwest, just as the South has its negro labor problem, the crowded centers of the East and Middle West have their melting pot of the unassimilated foreign labor to deal with. What the Pacific Electric Railway, operating in southern California, has accomplished in dealing with this humble and conscientious foreigner is an outstanding example of what fair dealing and the application of modern principles of sanitation, education and hygiene can do in overcoming handicaps and making the best of a difficult situation. It is doubtful if a common labor problem more difficult of solution than this which has for years confronted the Pacific Electric



Type of buildings and facilities furnished in the 22 Mexican camps operated, maintained and supervised by the Pacific Electric Railway

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Railway has arisen at any other point in the United States.

Due to his foreign tongue, his lack of education and the pitiful financial condition in which he usually arrives in this country, the Mexican's adaptation of himself to American conditions of labor, life and living is by no means an easy task. On the Pacific Electric, the problem is further complicated by the widespread activities of this great interurban system, extending as it does over four large counties, any one of which is larger in area than certain Eastern states. It was realized that a helping and kindly hand was necessary if these people were to be counted upon to supply the all-necessary element of brawn so essential in the great building program of this "world's largest interurban system."

The housing problem was that which offered the most serious obstacle to their beneficial employment. All over the West, and in southern California particularly, there are few if any tenement districts and it is questionable if their introduction would, under any circumstances, be tolerated. As a consequence and in deference to this feeling it was deemed advisable to establish housing centers in widely separated areas. At first certain communities did not view with favor the company's effort to establish colonies of these undesirables in their midst. Today, however, due largely to the intelligence that was displayed in building, maintaining and supervising these settlements, this agitation and feeling have to a great extent been overcome, and the company's experiment is regarded as a praiseworthy achievement in social relationship. To quote from an article appearing in a local paper where one of the settlements is situated: "The premises of the colony are kept with a cleanliness and care for appearances that would shame some of the homes and grounds of the community."

When the problem was first approached a number of years ago it became apparent, after careful investigation into the conditions under which this class of people was living, that careful supervision would be necessary. Entire families arriving in this country in ignorance of our language, strangers to our manner of living and having nothing in view but a hope for providing a better living for themselves, left much of a humane nature to be done. Often they had neither adequate clothing nor food nor the means wherewith to provide these necessities. In assuming the responsibility of introducing a people thus poorly equipped into an American community of advanced ideas and a uniformly high standard of living and culture, the Pacific Electric conceived it to be its duty not only to provide the means of obtaining a livelihood but also to educate these immigrants in the elements of cleanliness and right living. It was also desirable that they become good American citizens in the event that they decided to make their stay in the country a permanent one. As a means to this end the company has established a supervision of their camps which has worked wonders in the last few years with the result that cleanliness, happiness and prosperity mark the inhabitants of the camps under the control of the company throughout its entire system.

In each of the 22 camps there is an attendant employed to look after the general upkeep of the buildings and grounds connected with them, while in the ten largest camps two men are thus engaged. A trained nurse visits the camps regularly, giving instructions in sanitation and hygiene and offering advice in regard to medical treatment and care. The children of school age are sent to school and the parents are urged to see that they appear in a clean and tidy condition.

Scene in a typical Pacific Electric Mexican labor camp. The camp nurse, standing among the children, supervises their health, sanitation and general welfare

This work is carried even further. At various times during the year requests are sent out to the American employees of the company for toys, wearing apparel, etc. The contributions are collected, sorted and distributed where they will do the most good. Each year at Christmas suitable gifts are presented to the children by the company and at the annual picnic a special committee is appointed to provide entertainment for the Mexican employees and their families.

Occasionally families that have found themselves, so to speak, and are well on their way to becoming good American citizens will leave the camps and establish homes of their own. The company does not consider its obligation ended in such cases, however, and continues to offer in a general way help and supervision where it is needed.

These camps, while they may not be the highest type of modern living quarters, are at any rate clean, sanitary and wholesome; they are fulfilling an important economic need and are relieving charitable organizations of considerable humanitarian work that would otherwise be necessary. Above all, it is felt that they are meeting a problem of international relations in a manner creditable to the company and the community which it serves. The company feels that it is being well repaid for the effort put forth and the work is to be continued.

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What Are You Doing To Meet Competition?

Electric railways cannot hope to succeed in the effort to win back lost patronage unless they keep pace with the rapid development of automobiles. Continued operation of obsolete equipment is a most serious handicap

By E. P. Waller
Manager Railway Department General Electric Company, Schenectady, N. Y.

EACH electric railway, steam railway and bus company is in reality a manufacturing company producing a definite product—transportation—which it is selling to the public at a fixed price. Are you making a profit, or are you spending your stockholders' money and selling your product at less than cost? Before we can analyze the methods of operation to put your business on a paying basis, we must first look at your equipment to see if you have modern tools to produce at a reasonable cost this transportation service which you are selling to the public.

In this article, which is based on a paper read before the Association of Equipment Men, Southern Properties, the author calls attention to the serious situation that arises from the failure of electric railways to keep pace in the replacement of obsolete equipment. Figures that have been available for some time indicate the staggering price which railways are paying for this backwardness in car replacements.

The technical press has published from time to time splendid articles on operating methods and types of equipment that have been found to produce good results. Investigations made by Electric Railway Journal more than two years ago showed that 34 per cent of the electric railway cars operated in the United States were over twenty years old and were obsolete, and that 54.5 per cent of the cars had been in service for fifteen years or more. These figures must be materially higher today and I dare say that there are more than 40,000 cars in daily operation that are so obsolete, so inefficient and so expensive to maintain that their continued operation is subject to most serious question. How can you expect to manufacture transportation economically with obsolete tools of this kind? Don't forget that there are two sides to this story: one is the manufacturing problem and the other the sales problem. What sales resistance are you meeting in the sale of your product to the public? Are you doing anything to attract the rider or are you giving him a product that you feel you should apologize for and he feels a little ashamed to purchase? During the year 1927 only 1,220 new rail cars were purchased by the electric railways in the country. These same companies purchased approximately 1,600 buses while your customer, the public, was purchasing something like a million private automobiles.

It may sound a little foolish to compare the purchase of street cars and buses with the private automobiles purchased by the public. But where is your competition? In the early days of the bus we heard a great deal about bus competition with street railways. To my mind that was never a serious problem. Your problem in disposing of your service—in selling it—arises from the competition offered by the increasing use of the private automobile. The question of traffic congestion, the parking of private automobiles in the city streets, which were never intended for such use, is becoming a more and more serious problem every day and within the next few years will force the municipalities of this country to enact stringent regulations. The parking of automobiles within a given radius of the business section of any city will be prohibited. To anticipate that situation it is highly important that electric railways improve their own service by discarding these 40,000 obsolete cars which are reaching or have already reached the quarter century mark.

For the first six months of the year 1928 less than 200 new cars have been purchased despite the convincing figures in dollars and cents that justify a tremendously higher rate of equipment renewals. In 1926 a survey was made by Electric Railway Journal. Forty typical roads operating in all parts of the United States were selected and the operating costs tabulated for a period of years. Twenty of these roads had purchased practically no equipment within ten years; on the other twenty, about 50 per cent of the cars were not over ten years old. Both groups operated about the same size and total number of cars, both served the same total population and both had the same proportion of city and of interurban tracks, and a comparable level of labor rates.

The total operating cost of the twenty backward properties was 37.94 cents per car-mile. The corresponding cost of the more progressive group, although only half

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of its equipment could be considered modern, was only 28.29 cents per car-mile. This shows the economic value of modern equipment. If all the equipment of these twenty roads had been modern a much better showing could have been made. To make sure that the difference was due to the equipment and not to more efficient management, a further comparison was made between operating costs of the same properties before and after modernization. This showed that the second group had been operating a little below the first group, or 36.41 cents per car-mile as compared with 37.94 for the first group. By replacing 50 per cent of the old shipment a saving of 8.12 cents per car-mile was effected. This would indicate a possible saving of 16 cents per car-mile if all obsolete cars had been replaced with modern equipment. On five roads of the group this had been done. The operating cost of these five roads using nothing but modern cars was 23.64 cents per car-mile as compared to 39.56 cents per car-mile prior to the modernization or almost exactly 16 cents car-mile reduction. Of this 16 cents saving 12 cents was saved in power and maintenance, a reduction of 55 per cent, and 4 cents was saved in transportation expense, mostly through one-man operation, a reduction of 28 per cent in this account.

If a manufacturing company should attempt to turn out its product with tools as obsolete as the cars many of the transportation companies are using today to provide their service, the inevitable result would be that the sheriff would soon take charge of the plant. I beg you to take an inventory of your equipment, modernize your tools, and I am very sure that the results will be more than gratifying to your stockholders.

There is no reason to suppose that similar results cannot be shown on any property where the conditions are comparable. The savings alone will amply justify the replacing of old equipment. Two hundred and six electric railways reported to the American Electric Railway Association an average cost for the year 1927 of 31.4 cents per car-mile, of which power and maintenance cost was 12.26 cents per car-mile, and the transportation account was 13.54 cents per car-mile. A 55 per cent reduction on the first item would be 6.74 cents and a 28 per cent saving on the second 3.79 cents, giving a total of 10.5 cents per car-mile, which would mean a saving of $4,150 annually on each car purchased on the average of 39,500 car-miles per year, the average shown on the 206 properties referred to. This amount is approximately 30 per cent on the first cost of a modern light-weight A.E.R.A. standard car, or 2½ times the fixed charges.

The roads in the Southern territory probably show a lower average than those given. But very few roads will be found that will not average at least 10 cents for power and maintenance on routes where old heavy-weight cars are operated, and probably none that will be that low for transportation accounts without one-man operation. On such properties a saving of 8 cents per car-mile, or $3,160, per car per year could be shown, which is equal to a return of 20 per cent on the investment in a modern light-weight car.

Modern equipment will do more than affect the operating cost, for quieter operating cars, better looking cars, more comfortable cars and faster operating schedules appeal to the public and unquestionably will bring appreciably more riders, with resulting increased gross earning. Assuming that the substitution of new cars will bring in only 5 per cent increase in gross, this will, in many instances change a net loss to a profit.

A modern double-truck city car will weigh not over 60 per cent of the weight of cars with similar seating capacity built fifteen to twenty years ago. In the interurban field weight reductions of at least 50 per cent can be effected. The saving in energy consumption is nearly in proportion to the reduction in weight, there is materially less wear and tear on rails, joints and ties, less damage to pavement, less arcing at the trolley wheels, and the life of track is prolonged and the cost of upkeep of maintenance-of-way and structures materially reduced. Maintenance of equipment is in most cases reduced at least 50 per cent through the improvement in material and designs in the modern car and its component parts.

Modern light-weight equipment permits faster schedules, even when operated with one man, and the later designs readily lend themselves to the use of one man instead of two in all classes of service—city, suburban and interurban. To the direct economies of one-man operated cars, there should be added the savings due to operating a smaller number of faster cars for any given headway, and the increased riding that usually follows improved schedules.

If a manufacturing company should attempt to turn out its products with tools as obsolete as the cars many of the transportation companies are using today to provide their service, the inevitable result would be that the sheriff would soon take charge of the plant. I beg you to take an inventory of your equipment, modernize your tools, and I am very sure that the results will be more than gratifying to your stockholders.

Another feature service to the industry ——

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Sept. 22 is the date.

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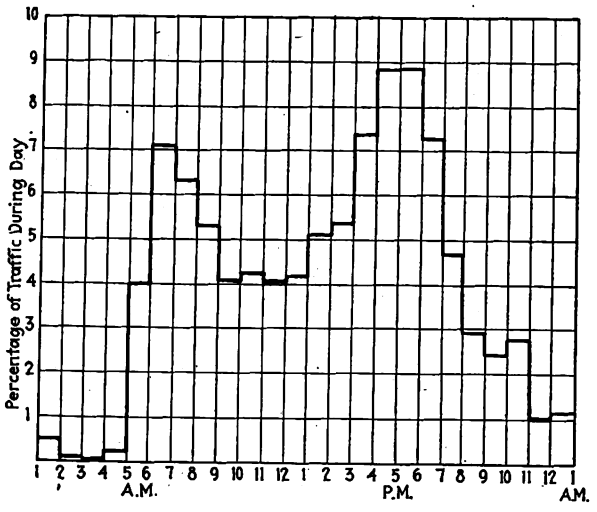
Traffic Is Growing in Berlin

TRAFFIC on the Berlin transportation lines is growing, according to an article in *Verkehrstechnik* for June 29. The figures for 1927 and 1926 follow:

TABLE I—PASSENGERS CARRIED IN BERLIN, GERMANY, (IN MILLIONS)

	1926	1927
Street railways	813.2	834.7
Elevated and underground	163.2	222.5
Omnibus	112.8	156.7
Total of above	1,089.2	1,213.9
Stadt, Ring and Vorortbahnen	371.0	379.0
Total of all four	1,460.2	1,592.9

In this calculation, a passenger who transfers from one vehicle to another of the same kind is counted only once, but if he transfers from one means of communication to another, he is counted twice. Beginning on March 15, 1927, a flat fare of 25 pfennigs permitting a transfer generally between street railway and elevated and a somewhat limited transfer between these two means of transport and the buses was put into force. The street railways, elevated and subway, and the omnibus lines are controlled by the city, the Stadt, Ring and Vorortbahnen by the Federal Railway Company.



Hourly traffic on average week day, Berlin surface lines

On the street railways, elevated and subway and omnibus lines, traffic per day by months did not vary greatly during 1927, except to show a gradual up-trend. Traffic by days of the week was also fairly constant except that Saturday was the high day for all means of transport and Sunday the low day. An hourly count of passengers carried on an average week day by the street railway system is reproduced. On the elevated line the peaks are somewhat more emphasized. The bus curve does not differ greatly from the street railway curve.

A comparatively large proportion of the business on all means of transport is by commutation tickets. On the street railways, 38.3 per cent of all rides are taken with some form of commutation ticket.

The average speed as determined by the car-miles divided by the car-hours was as follows: Street railways, 8.9, rising on Sundays and at times of light traffic to 9.6; elevated and subways from 14.9 to 15.3; omnibus 9.1.

At the end of 1927 the rolling stock of the street railways consisted of 1,880 motor cars and 1,761 trail cars, or a total of 3,641 cars. Three hundred center-entrance motor cars have been ordered. They will operate either singly or in multiple-unit trains.

The elevated and underground system has 427 passenger motor cars and 401 passenger trail cars, all of one class. Up to March, 1927, cars of two different classes were operated.

At the end of 1927, 561 buses were in operation and 104 had been ordered. The latter were of the six-wheel double-deck type with balloon tires.

The street railways had 8,339 motormen and conductors, 4,177 repair men or other hand workers, and 886 office employees. The division on the bus lines was respectively 2,023, 787 and 383. The elevated had 6,200 employees altogether. A consolidated operating report for the three means of transit mentioned is presented in Table II.

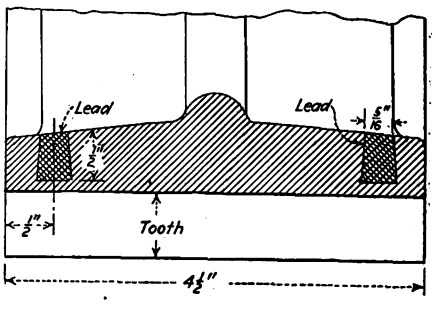
TABLE II—CONSOLIDATED OPERATING REPORT, STREET RAILWAYS, ELEVATED AND UNDERGROUND AND OMNIBUS LINES IN BERLIN DURING 1927

Operating expenses	M120,429,000	$30,107,250
Renewals and depreciation	26,542,000	6,635,500
Taxes	26,354,000	6,588,500
Return to capital	16,379,000	4,094,750
Surplus	896,000	224,000
Total receipts	M190,600,000	$47,650,000

Reducing Street Car Noises

Market Street Railway leads gears, places acoustical cloth under floor boards and uses rubber pads to accomplish this end

FOLLOWING out its policy to make its service more attractive to the public the Market Street Railway of San Francisco has recently been giving considerable attention to the matter of reducing the noises of car operation. Realizing that axle gears are an important factor in the transmitting of wheel noises into the car body, special effort has been directed toward deadening the noises arising from this source. Very satisfactory results have been accomplished by cutting grooves $\frac{5}{16}$ in. deep and $\frac{1}{2}$ in. wide on the under faces of both sides of the gear rim and filling these grooves with lead. The process is illustrated in the accompanying illustrations. The grooves are cut with a slight slope and left rough on the



Cross-section of rim of 67-tooth gear showing position of lead rings

Rubber pads are placed between car body and frame to reduce transmission of noise

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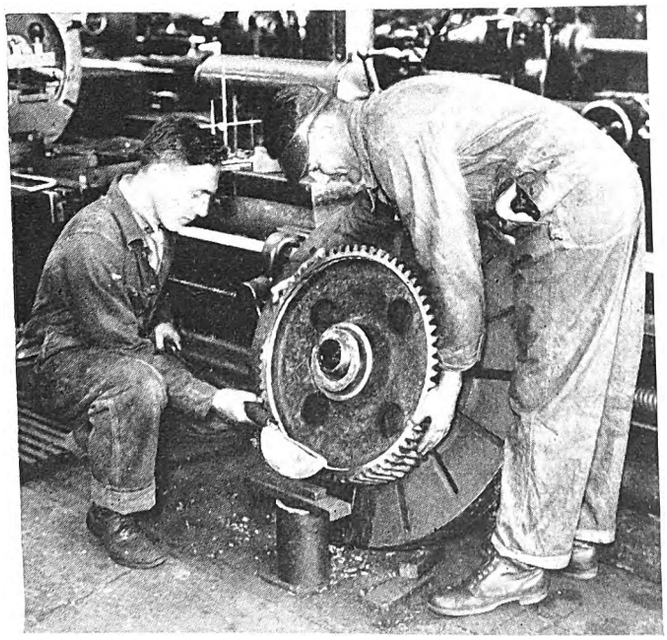
Placing soundproof insulation between car floor and frame. The entire floor is covered in this manner

last cut so as to retain the lead, which is poured in a molten state and is not calked, an acetylene torch being used to flow the ends together. Early practice was to shroud the gear case with acoustical cloth, but this was abandoned as being unnecessary.

Other practices developed to reduce noises arising from operation are the placing of a $\frac{5}{8}$-in. rubber pad under the center plate on the truck, the insertion of canvas between axle and axle collar, and the placing of $\frac{1}{2}$-in. acoustical cloth under the trolley base. Acoustical cloth, covered with acoustical cement, is placed under



Pouring a thin lead ring into a groove in a gear

the floor boards for the entire length of the car, in addition to which the entire floor is covered with Industrial Karpet laid with P. & B. paint. Half-inch acoustical cloth is placed under the trolley board saddles, felt is used to line the motor case cover groove, armature cap and axle cap covers are insulated with canvas, and $\frac{3}{16}$-in. rubber buffers are used on door jams and pockets to cushion the jar of the door. Compressor boxes are made of wood instead of metal. Body sills are insulated from the bolster "Z" iron with $\frac{3}{16}$-in. rubber pads. The result of these measures has been a marked reduction in the ordinary noises produced by operation, and the company plans to follow the same practice on all of the 26 cars which it will build in 1928.

An Ideal British Tramcar

Prize essay in Municipal Tramway and Transport Association contest gives details of ideal car from engineering and passenger points of view

WITH the desire to find the points which make up an ideal tramcar, both from the standpoint of the engineer and that of the passenger, the Municipal Tramway and Transport Association of Great Britain conducted an essay contest last year. The paper submitted by J. F. Richards, rolling stock superintendent Oldham Corporation Tramways, was awarded first place. His paper is interesting to American readers, since it gives in detail those elements which are considered desirable in a tramcar to meet the conditions that exist in Great Britain. Following are the principal points he brings out:

Cars are usually considered in terms of carrying and earning capacity. Although an engineer designs the car to fulfill these requirements, it does not necessarily follow that he agrees with the principle. For instance, there is a good deal to be said against the double-deck car. In order to arrive at the ideal, earning capacity will not be considered.

Since the primary function of a tramway car is to convey the public, it must have everything that makes for safety and comfort; it must be capable of maintaining a fairly high speed and insure both smooth and quick acceleration and retardation; it must be hygienic and easily kept clean and attractive. The design throughout should permit the car to give maximum all-round efficiency for a minimum maintenance charge. The equipment must be disposed and installed so as to be easily inspected, adjusted and operated. The human element should be reduced to the minimum.

Favors Single-Deck Car

To meet the above conditions, the car should be of the single-deck, vestibuled type, mounted on a single truck or on double trucks, depending on the physical nature of the route and the required length and passenger capacity. A double-truck car could be 35 ft. long between body corner posts, while a car on a long wheelbase single truck might approximate 24 ft. between corner posts. The sills should be continuous to the end of the platform, and the platform floors should be continuous with the car floor.

There must be no heavy unsprung parts, such, for example, as motors. Bearings should be of the ball or roller type; motors of the light-weight, high-speed type, their horsepower to be determined by general conditions, with differential and worm-driven axles, connection to the motor being with a Cardan shaft and universal couplings. The wheels must be mechanically attached to the axles by means of splines in a manner similar to that adopted in automobile practice.

Service and emergency braking should be by internal expanding blocks acting on drums which form an integral part of each driving wheel or else on a separate drum, mechanically attached to the wheel center. They would

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be air operated and hand controlled. A secondary rheostatic brake would be operated through the controller but would be used only in the event of the failure of the air brakes. All air equipment would be placed below the floor level. Air sanders would also be included. Controllers would preferably be of the contactor type, of robust design and fixed in such a position that it is easy to operate them while the driver is seated.

Doors and steps would be of the folding type, interlocked, and controlled either by the conductor or the motorman. At busy periods, passengers would enter the two-man car at one end and leave at the other. On a one-man car, all entrances and exits would be at the front end only.

The body should be secured to the truck in such a manner that the bolts can be inserted or removed without removing various fixtures and panels. The body under-frame, side frame and miscellaneous members should be of light-weight metal, machined and drilled in jigs so as to be interchangeable. The body should have straight sides, giving maximum interior width. Window glass should be fitted into single-unit metal sashes with fillets at the corners to preclude dirt collecting. Window sash would slide upwards for removal from the exterior only. Ventilation should insure the adequate extraction of vitiated air and a fresh supply of new air.

Lighting wires should be run in channels built into the roof and sides with molding covering them to form a part of the inside roof preparation. Power cables would be carried in a trough or channel in or immediately above the body sills. All switches, fuses, lightning arresters, choke coils, etc., would be mounted in the motorman's cab.

Provides Comfortable Seats

The seating would be transverse, with individual seats set side by side in pairs. The seats would be of the bucket type, formed out of plywood or a material which could be set or molded into the desired shape, and mounted on a centrally fixed metal pedestal on which they could revolve. Seats would not be upholstered.

The floor surface would be of composition, slightly crowned towards the sides to drain off water. There should be a fillet where the floor adjoins the sides, to prevent the accumulation of dirt and facilitate cleaning.

Hand-rails and grab-handles should be of a non-tarnishing metal, preferably stainless steel. No lacquered fittings should be used, as the transparent lacquer quickly deteriorates. The exterior would be finished by the cellulose spray process, with a minimum of striping, but with suitable design as desired.

Destination sign boxes would be built in at the end of the car and at the side center windows.

For country service powerful headlights could be fitted on the car roof, but they should have dimmers. For normal city service, two single side lights built into the car vestibule dash are sufficient.

The trolley collector gear must be as light as possible, requiring a minimum tension to keep the trolley wheel on the wire. The driver should have a totally inclosed cab and should be seated. In front of him should be a clear glass window, the lower portion of which would be fixed, while the top portion would be hinged. Immediately over this should be another adjustable screen glazed with anti-dazzle glass. This secondary screen would prevent rain or snow driving on to the clear glass and could be thrown down to cover the clear glass to prevent eye strain during brilliant sunshine. All of the end glass should be of the non-splinterable type. Roller curtains should be fitted to the rear cab windows to prevent reflections from the car lights blinding the motormen.

The car should be attractive and distinctive of appearance without advertising matter. It should be comfortable, safe, silent and smooth running. Motor control and brakes must be designed to give easy and gradual starting and stopping. There should be a "dead man's handle" so that the car could be stopped automatically in emergency. There should be some means to arrest the progress of the car should it get out of control and run backwards.

Passenger's Viewpoint Considered

Ingress and egress must be easy. The doors and steps should be so arranged that passengers enter at one end and leave at the other end. This system of loading and unloading would help considerably in speeding up the service. The single deck is advantageous to the passenger, eliminating stairs and increasing safety, speed and comfort. It would also decrease the stopping time.

Comfortable upholstered seats arranged transversely are to be preferred. If possible, they should be individually arranged, with the seat back shaped. The aisle should be of such a width that standing is out of the question. The space might better be devoted to seating area. Foot rests are desirable, but may be tubular so that they can also be used to inclose warm air heaters. Control of the heating element might be made individual. There should be no cleats on the floor, but the surface should be made of a non-absorbent material which could be washed.

The floor and sides should be durable and should be packed with sound reducing material. Windows should be glazed with triplex glass and should be fixed. An electric fan would be desirable for use on hot days. A supplementary window frame and sash glazed with anti-dazzle glass for each individual window would be desirable. These should be arranged so that they could be slid up to cover the ordinary window completely.

Commodious baggage racks are an accessory which should be provided. Artificial lighting must be adequate but restful. Brilliant lighting is not necessarily comfortable lighting.

Besides the ordinary destination and route indicators visible from the outside, special route signs, to be illuminated at night, are recommended.

New Theory on Electrolysis

FROM an investigation of oil pipe line corrosion the Bureau of Standards found that a huge earth battery, releasing electricity of low voltage, may be formed when a metallic pipe passes through soils of different chemical composition or moisture content. In the course of an attempt to correlate soil conditions with the corrosion found on an oil pipe line, measurements of electric current were made on several sections of the line. It was found that in some places the line was collecting current while at other points current was discharged, the points of discharge corresponding in a general way with the place where the line was corroded.

The line was 35 miles from the nearest electric railway and there was no evidence of stray railway currents. Apparently the corrosion was caused by the action of large galvanic cells formed by the pipe line passing through soils of varying chemical composition.

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Maintenance Methods *and* Devices

Hot-Pot Trailer for Patching Pavement*

By Charles Herms
General Foreman
San Diego Electric Railway,
San Diego, Cal.

PATCHING of asphalt paving along the tracks of the San Diego Electric Railway is facilitated by use of the hot-pot trailer illustrated. It was designed and built in the railway's shops. It is of all-metal welded construction. A Buick chassis was used and the springs were reinforced to carry the load. The original wheels were turned down and a $\frac{5}{8}$-in. steel tire was shrunk on and turned to the proper taper to take a 30x5-in. R.M.C. tire.

The hot pot consists of a round tank of $2\frac{1}{2}$ bbl. capacity. The body box is divided into two sections. One holds $\frac{2}{3}$ yd. of crushed rock, and the other $\frac{1}{3}$ yd. of rock screenings. The sides of the body are inclined outward so a man standing alongside can shovel out the rock and screenings.

The pot is fired by cut-up pieces of old wooden ties, and the heat is controlled so that it can be directed around the pot or it can be diverted so as to pass underneath the rock and screenings through a flat flue 4 in. high and 33 in. wide. From this it passes through the rear smokestack. Provision is made by means of dampers, so that the heat can be divided and part of it directed each way. After heating, the material combines more readily with the oil.

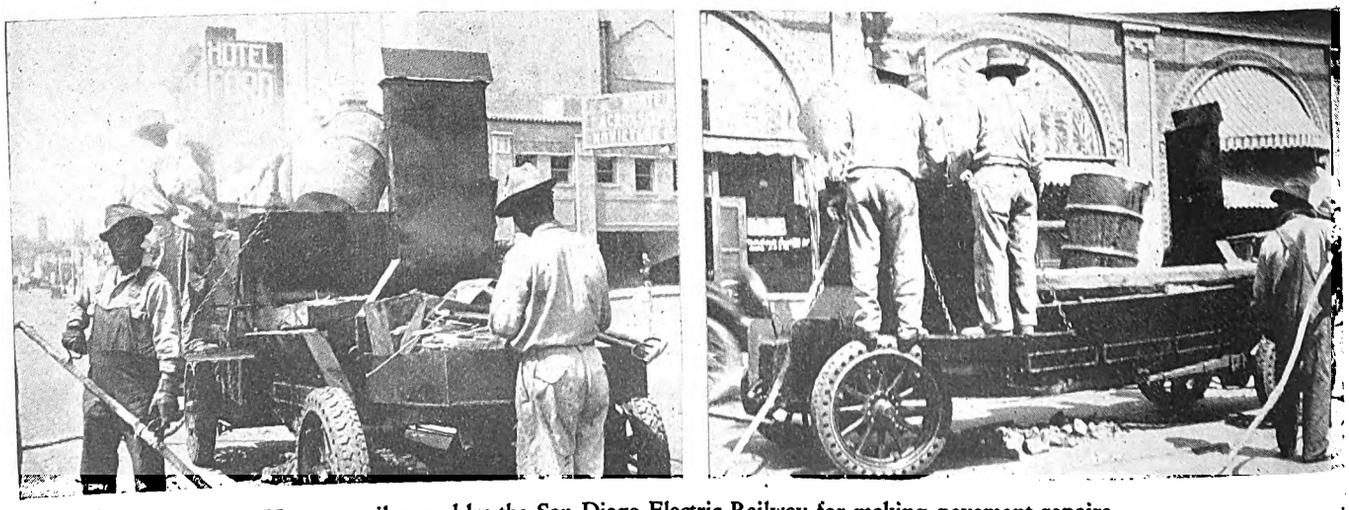
The oil is forced out into a hose line for distribution by means of a geared pump in the bottom of the hot oil pot. This is driven by a sprocket and chain, geared so that three turns of the hand crank produce one turn of the pump. Sufficient pressure is thus placed on the hot oil so that it is thrown out with some force and readily penetrates crevices of broken pavement. After the pavement walls at the edge of the patch are primed, the proper amount of crushed rock is filled in and the oil sprayed on under pressure. A special nozzle is used which has a flat aperture so as to spread the oil out in a fan-shaped spray. After the oil is sprayed on, a covering of rock screenings completes the job. It is advisable to tamp the work down somewhat after spreading the screenings. For holes that are several inches deep it is necessary to fill in alternately with layers of rock and oil so as to make a good bond. A flexible steel hose is used with an 8-ft. length of $\frac{3}{4}$-in. pipe. This has two handles, the lower handle operates a cut-out cock to shut off the flow of oil. If the spray is not to be used for several minutes, the operator reverses the pump, which sucks the oil out of the hose back into the hot pot. Otherwise there is danger of the oil becoming hard. Then it is necessary to heat the hose to get the oil flowing again.

A perforated sheet metal screen is installed around the pump, so that when a new barrel of oil is added the cold oil will not get to the pump and clog it. The pump operator stands on a folding platform which is raised while traveling to and from the work. A brace is installed across the pot in such a manner that a barrel of oil can always be carried in an inverted position in the pot. The oil used is quite heavy and takes about 30 minutes to run out. By having a support for the barrel no attention is required after it has once been placed in the pot. A sheet metal box in the rear of the trailer carries the necessary fuel and tools. The trailer is also equipped with brakes which are operated by means of a chain from the towing truck. Use of this equipment has resulted in a considerable saving in cost of street repairs.

Submitted in Electric Railway Journal Prize Contest.

Axle Collar Adjusting Bolts Held Rigid

MOVEMENT of the adjusting bolts in axle collars caused considerable trouble on the Richmond Railways, Inc., Staten Island, N. Y., until a method was devised to prevent it. The collars furnished originally with the motors had a $\frac{3}{4}$-in. adjusting bolt threaded into a lug. A cotter pin was inserted in the bolt through a slot in the lug to prevent turning. This arrangement permitted a slight movement of the bolt in the casting, causing appreciable wear on the threads and shearing of the cotter pins. The result was that the bolt adjustment was lost and the



Hot-pot trailer used by the San Diego Electric Railway for making pavement repairs

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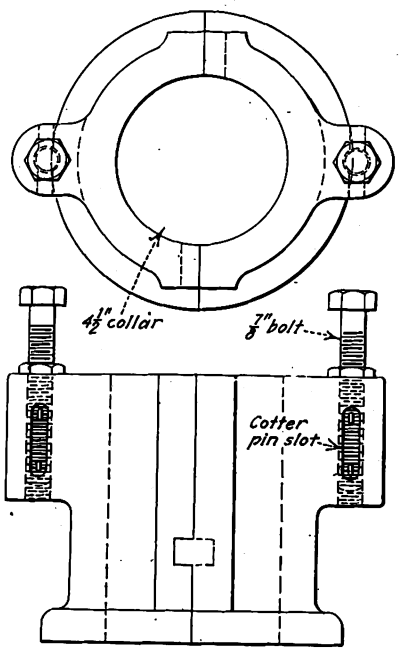


Locknuts for axle collar adjusting bolts

motor shifted. This trouble has been eliminated by drilling and tapping the casting to take instead of the ¾-in. bolt, a ⅞-in. bolt with a locknut in addition to the cotter pin, as shown in the accompanying sketch.

A careful inspection of these bolts after long service has shown that shifting of the adjusting bolts has been eliminated.

Substantial Rail Fastening*

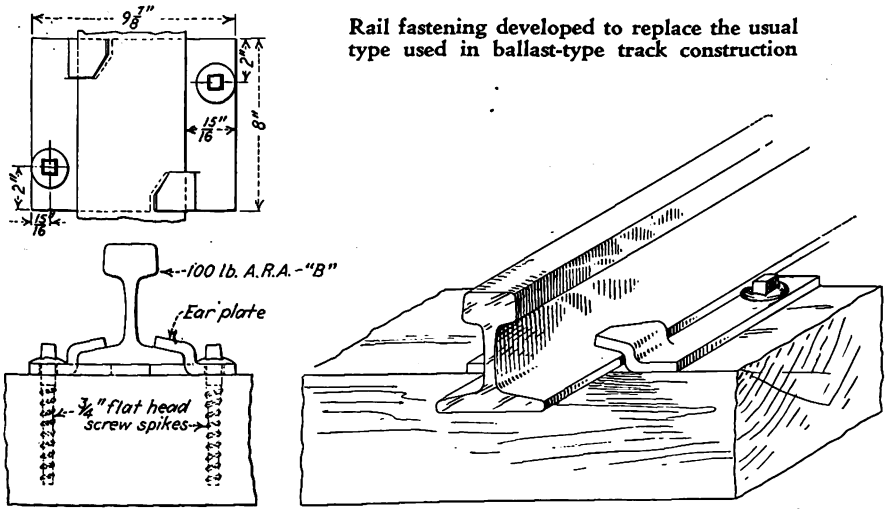
By I. O. Mall
Assistant Superintendent of Roadway
New Orleans Public Service, Inc.,
New Orleans, La.

FASTENING the rails to the ties in ballast type track construction of the New Orleans Public Service, Inc., is being accomplished by a combined tie plate and lock designed to replace the usual type of rail fastening. It consists of an ear plate which is held in contact with the tie by flat-head screw spikes. There are two ears on the plate which are placed diagonally and so spaced as to come into fishing contact with the base of the rail when the plate is in proper position. The plate is held in contact with the tie by two flat-head screw spikes spaced on the diagonal opposite the ears.

With this arrangement the spike functions only as a fastening device for holding the plate in contact with the tie in such a manner that it cannot move. The rail is held in position and to gage by the ears on the tie plate. The fastening is more substantial than the usual installation of hook-head spikes. An element of flexibility is maintained by virtue of the distance between the ear and the flat-head spike fastening. The direct strain due to rail movement is removed from the spike. This feature allows an increased life in the spike fastening so that it will last throughout the life of the tie without maintenance.

The observed action and effect of this type of fastening over a period of years shows that the track remains true to gage, that the tie plate remains in firm contact with the tie and that there is no appreciable churning of the ties on the ballast due to the more rigid type of fastening. In some places where electrolysis has been bad the ears have been electric welded to the base of the rail and the screw spikes spot welded to the tie plate. Those installations where welding has been done show results no different from a maintenance point of view than where the welding was omitted.

*Submitted in Electric Railway Journal *Prize Contest.*

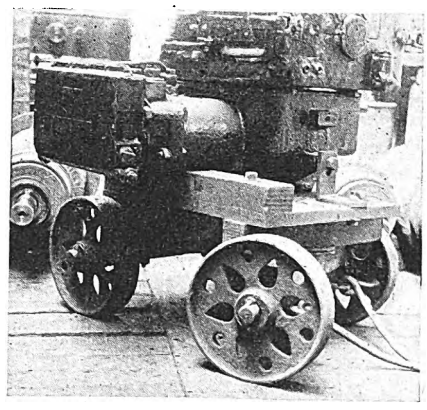


Rail fastening developed to replace the usual type used in ballast-type track construction

Special Compressor Truck

SAFE transportation of its apparatus is given considerable attention in the shop of the Richmond Railways, Inc., Staten Island, N. Y. Special trucks are used for carrying certain parts of equipment in order to guard against accident. The accompanying illustration shows a hand truck designed and constructed in the shop for the transportation of air compressors.

The platform of 1-in. planks is bolted to a rear bolster 2¾x5½x17 in. and a front bolster 2¾x2½x17 in. All woodwork is oak. A block 2¾x2½x17 in. is bolted to the front axle. This



Type of truck used for transporting compressors in the shops of Richmond Railways, Inc.

axle is held in position by a ¾-in. king pin passing through the center of the platform and axle bolsters. The weight on the front axle and the rotating movement of the front wheels is taken care of by two disks ¼ in. thick and 5 in. in diameter. One is bolted to the platform bolster and the other to the axle bolster. The axles are made from 1¼-in. stock and the wheel fits are 1 in. in diameter. Axles are spaced at 18 in. centers and are mounted on iron wheels of 11 in. diameter and 2½ in. face. The wheel centers are 21 in. A ¾-in. round iron handle 5 ft. long provides for easy movement. It will be noticed that an oak block 3 in. wide and 2¼ in. high is bolted to one side of the platform and forms a rest for the compressor cylinders. The bottom of the crankcase rests upon the platform. For further safety a ½x2½-in. angle is bolted to the platform and the vertical leg drilled to meet the compressor suspension bracket hole. Bolting this bracket to the compressor assures its safe transportation under practically any condition. Since this truck has been in service not a single compressor has fallen to the floor.

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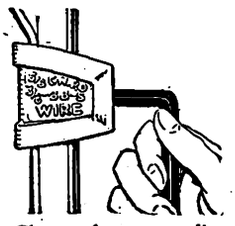
New Equipment Available

Grounding Wire Connection Clamp

DESIGNED to encircle the ground rod and bind the grounding wire directly to the driven member a simple and effective grounding wire clamp has been announced by the Copper Weld Steel Company, Glassport, Pa. With this method no solder or heat is required. The clamp is placed around the rod, the grounding wire is inserted, and by tightening a set-screw the connection is formed. Advantages claimed for this method are the elimination of the melting pot, ladle and other soldering equipment, and a reduction in the time needed to effect the connection.

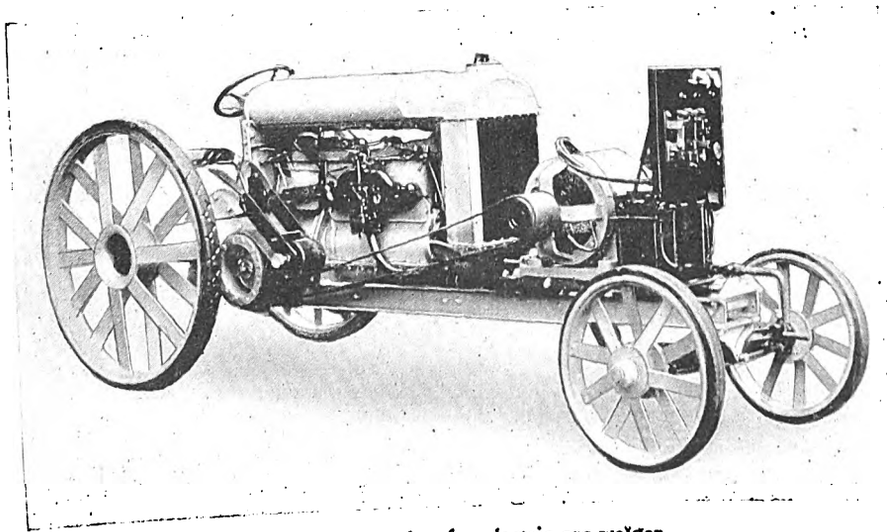


Clamp for grounding wire connection

Arc Welder Mounted on Tractor

MOUNTING of a new kind for the standard Lincoln Electric Company's Stable-Arc welder has been announced by the Pontiac Tractor Company, Pontiac, Mich. The welder unit with stabilizer and panel are mounted on a frame which attaches to either the McCormick-Deering 10/20 or Fordson tractors. The Pontiac mounting gives a four-wheeled rubber tire self-propelled unit, which is capable of hauling heavy loads. This unit is also mounted on crawlers for soft ground work.

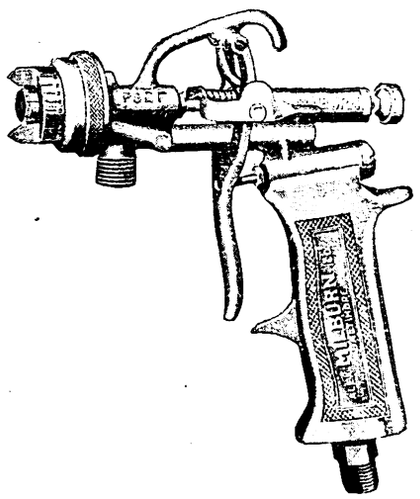
Power is taken from the tractor to drive the welder through a power take-off pulley, which has a clutch, allowing it to be thrown out or into gear at will. The forward drive of the belt brings the belt tightener into correct relation with the belt.



Tractor mounting for electric arc welder

Dialed Head Added to Spray Gun

STANDARD spray guns manufactured by the Alexander Milburn Company, Baltimore, Md., have been augmented by two recent additions.



Improved features added to spray gun

The first of these is a dialed head which gives numerous different spray adjustments from a circular spray to a fan of a wider field than has been possible heretofore with spray guns.

The second addition includes a series of indicator numerals on the paint valve plunger. A pointer moves as the adjustment button is turned. Just as the dial in the head produces the exact spray desired, so the indicator numerals on the paint valve plunger show the exact volume desired without the loss of time by testing. The operator, having found that a certain class of work is performed best when the indicator points to a certain figure, makes the proper adjustment before beginning to spray.

The new Milburn spray gun is known as Type EF. To enable users of the Type E gun to obtain the benefit of the improvements, the new dialed air control valve and the plunger have been made interchangeable, and can be inserted.

Mica Undercutter for Small Spaces

SAVING of the time necessary for taking down and assembling a generator or rotary converter is claimed for a new undercutter announced by the Ideal Commutator Dresser Company, Sycamore, Ill. This can be operated in a space only 3 in. wide. The machine is driven from a small electric motor through a flexible shaft. The motor can be furnished in any voltage desired. The shaft is at right angles to the arbor which carries the saw, the latter being driven by gears. A depth gage next to the milling cutter is placed at the bottom. A micrometer adjustable guide operates in the slot next to the one being cut.

Mica undercutter in position ready for slotting a commutator

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Association Activities

American Association Nominations for 1928-29

RECOMMENDATIONS for officers for the American Electric Railway Association have been made by the nominating committee, of which Britton I. Budd is chairman. The following names have been placed in nomination:

For president, James P. Barnes, president Louisville Railway, Louisville, Ky.

For first vice-president, Paul Shoup, president Pacific Electric Railway, San Francisco, Cal.

For second vice-president, J. H. Hanna, president Capital Traction Company, Washington, D. C.

For third vice-president, C. E. Morgan, vice-president Brooklyn City Railroad, Brooklyn, N. Y.

For fourth vice-president, G. A. Richardson, vice-president Chicago Surface Lines, Chicago, Ill.

For treasurer, Barron Collier, president Barron G. Collier, Inc., New York, N. Y.

For Executive Committee: Operating members, three-year term: H. B. Potter, vice-president United Railways & Electric Company, Baltimore, Md.; W. A. Draper, president Cincinnati Street Railway, Cincinnati, Ohio.

Manufacturer members, three-year term: Carroll Burton, president Lorain Steel Company, Johnstown, Pa.; E. D. Kilburn, vice-president Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; Wm. M. Wampler, president Ellcon Company, New York, N. Y.

Way and Structures

CONSIDERABLE routine work was disposed of and a number of interesting special committee reports were brought up for approval at the third and final meeting of the way and structures committee of the Engineering Association, held at association headquarters, New York City, on July 19. Members present were Chairman H. H. George, Vice-Chairman E. M. T. Ryder, C. A. Alden, W. G. Hulbert, J. R. McKay and C. A. Smith. The following special committee chairman also were present: W. R. Dunham, Jr., C. F. Gailor, Adrian Hughes, Jr., and W. W. Wysor.

Mr. Hughes submitted a tentative draft of the report of the special committee on bus garage design. The discontinuance of some of the subjects and the revision of the assignment of another were recommended. After a discussion of a few minor changes the report was approved.

Mr. Dunham called attention to the final report of the special committee on review of the Engineering Manual. The letter ballot on the revision of Manual section W-112-22 — specifications for low-carbon steel track bolts—which constitutes final action on this report, has not yet been completed.

Mr. Ryder submitted the report of the committee on special trackwork, but stated that the report had not yet been approved by the committee membership. In discussing the section of the report dealing with rules for the maintenance of electric switches, Mr. Wysor emphasized that the rules evidently covered only one type of switch operating mechanism, namely, the solenoid type, and at the suggestion of Mr. Hecker the heading of this subdivision of the report was changed accordingly.

A progress report of the special committee on foundations for special trackwork was submitted by L. A. Mitchell. Mr. Ryder called attention to the desirability of wording the report so as to eliminate references which might savor of an indorsement of any particular type of crossing and Mr. Mitchell agreed to take care of this.

The chairman read a report which had been forwarded by the special committee on track drainage and ballast, which was adopted.

Mr. Smith reported that the final meeting of the special committee on wood preservation had been held on July 17. He reviewed briefly a tentative draft of the report in which the recommendation was made that a considerable number of Manual sections covering wood preserving oils and wood treatment be covered by reference to similar specifications of other associations only. It was the opinion of the way and structures committee that it would be undesirable to make this change, as many association members do not have available the manuals of other associations containing their specifications, and that this recommendation should therefore not be approved.

Mr. Gailor stated that the special committee on arc welding had no written report to submit, but that new data were being developed. He added that co-operation with the American Welding Society was working out entirely satisfactory and that the joint committee had reached agreement on a number of subjects.

Mr. Wysor submitted a tentative draft of the special committee on rail corrugation, stating that it had been approved by thirteen out of the seventeen members. It was suggested that slight modification be made to clarify certain references to experimental track under observation.

The special committees on alloy steels, pavement, track construction, joint bus and railway terminals and track gage had no reports to make.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Aug. 16 **— Metropolitan Section, American Electric Railway Association, fourth annual outing, Luna Park, Coney Island, N. Y.**

Aug. 16-17 **— Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.**

Sept. 7**—Maryland Utilities Association, mid-year meeting, Braddock Hotel, Braddock Heights, Md.**

Sept. 7-8**—Central Electric Traffic Association, Potawatomi Inn, Angola, Ind.**

SEPT. 22-28, 1928
American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

Sept. 25 **— Central Electric Railway Master Mechanics' Association, Cleveland, Ohio.**

Oct. 1-5**—National Safety Council, safety congress, New York, N. Y.**

Oct. 8-12**—American Welding Society, fall meeting, Philadelphia, Pa.**

Oct. 24-25**—Public Utilities Association of West Virginia, annual meeting, Huntington, W. Va.**

Nov. 14-15**—Public Utilities Association of Virginia, Roanoke, Va.**

Jan. 23-25, 1929**—Electric Railway Association of Equipment Men, Southern Properties, Houston, Tex.**

Wisconsin Utilities Complete Program

ANNOUNCEMENT has been made of the following program for the meeting of the transportation section, Wisconsin Utilities Association, to be held in Sheboygan, Wis., Aug. 16 and 17:

THURSDAY, AUG. 16
9:30 a.m.

Address of Welcome, Mayor Herman Schuelke.

Response, C. R. Phenicie, president Wisconsin Utilities Association.

Chairman's address, J. H. Lucas, Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

"Making the Streets and Highways Safe for All the People," by J. W. Oliver, chairman accident prevention and insurance committee, Highwood, Ill.

"The Need of Standardizing Highway Crossing Protection," by Andrew R. McDonald, commissioner Railroad Commission of Wisconsin, Madison, Wis.

"Track and Overhead Problems," by F. G. Hibbard, Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

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"Noise Research," by Silas B. Tobey, Menominee & Marinette Light & Traction Company, Menominee, Mich.

1:30 p.m.

LUNCHEON PROGRAM

Demonstration of psychological tests and explanation of their value in the selection of platform men, by W. J. McCarter, supervisor of training Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

"Furnishing and Co-ordinating Transportation Services in Cities up to 50,000 Population," by L. P. Fessenden, district manager Wisconsin Power & Light Company, Sheboygan, Wis.

Discussion led by Nels C. Rasmussen, Wisconsin Valley Electric Company, Wausau, Wis., and Clyde L. Hedges, Mississippi Valley Public Service Company, La Crosse, Wis.

FRIDAY, AUG. 17

9:00 a.m.

"Air Brake Installation and Maintenance," by Kenneth Wilkins, student engineer Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.

"Recent Developments in Lubrication Methods," by John S. Dean, Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.

"Electric Railway Service in the Eighties," by A. K. Ellis, vice-president Wisconsin Michigan Power Company, Appleton, Wis.

"Operating Results of Light-Weight Worm Drive City Car," by A. W. Baumgarten, division engineer Chicago & Joliet Electric Railway, Joliet, Ill.

1:00 p.m.

Luncheon speaker, Lucius S. Storrs, managing director American Electric Railway Association, New York, N. Y.

The annual dinner will be held on Thursday evening at 7 at Elkhart Lake, B. W. Arnold acting as master of ceremonies.

Ample provision has been made to entertain the ladies attending the convention, including motor trips, swimming and bridge. The delegates will be taken on a trip around Sheboygan and Kohler on Thursday afternoon, winding up at Elkhart Lake for golf and swimming.

Educational Program Announced

PLANS for a series of conferences to be held under the auspices of the Committee on Education of the American Electric Railway Association at the forthcoming convention at Cleveland, Sept. 22-28, 1928, have been announced. There will be two training courses, one for transportation department leaders, under the leadership of William A. Durgin, of the Commonwealth Edison Company, the other, for non-transportation men, to be conducted by Frank Cushman of the Federal Board for Vocational Education. Mr. Durgin's course will have for its principal objective the training of leaders who can help employees fit themselves for contact with the public; Mr. Cushman's course will be more along the line of training foreman conference leaders. Dr. A. J. Rowland, educational director, Milwaukee Electric Railway & Light Company, will have general oversight over both series of conferences.

The program is divided into six distinct elements, as follows:

1. Training course for conference leaders (transportation department).
2. Training course for conference leaders (non-transportation departments).
3. An educational luncheon conference under the leadership of Edward Dana, general manager Boston Elevated Railway, which will be one of the group of American Association luncheons. The discussion at this luncheon will center on the general subject of salesmanship in transportation.
4. Two informal luncheon conferences for personnel and educational directors, to afford an opportunity to talk over their every-day experiences and problems.
5. A dramatized lesson in safety, to be given by a dozen actual car and bus operators, as a part of the Transportation and Traffic Association program.
6. An educational exhibit.

GROUPS TO BE LIMITED

As the groups will necessarily be limited as to size, member companies will be permitted to enroll not more than one representative in each course. Accordingly, it is desired that men of the highest type be selected. Previous experience in teaching or the handling of conference work is not a necessary qualification, the principal aim being to secure an attendance of men who are deeply interested in the improvement of working conditions or the handling of public relation matters. A personnel director, a man engaged in service improvement, an employment superintendent, a member of the staff who has direct contact with large numbers of employees, in short, any employee who has displayed an interest in problems of human relationship is urged as the proper type of a person to send to the conferences. A limited number of invited guests may also attend.

As planned there will be five 4-hour morning sessions, running from Monday to Friday inclusive, from 8:30 a.m. to 12:30 p.m., supplemented by additional sessions in which actual demonstrations in conference leadership will be given.

COURSE FOR TRANSPORTATION DEPARTMENT MEN

This course will have for its primary object the training of leaders who can help their fellow platform men to fit themselves for contact with the public. It covers the entire phase of relations between platform men and the passenger, and is offered in the hope that it may have a favorable influence upon the attitude of the public toward electric railway trainmen in general. Emphasis will be placed upon the five major qualities or elements of individual service, namely:

1. Interest shown by the employee in the needs of the passenger.
2. Quality of information given passenger.
3. Speech used in conversation with passenger.
4. Politeness and tact.
5. Personal appearance.

This course, to be handled by Mr. Cushman, is to be along the line of training foremen to act as leaders in conference groups on their own properties. Instruction will cover the steps to be taken in the preparation for a conference, subjects to be discussed, and procedure to make the meetings of interest and value. It is expected that a considerable number of men with previous experience in these matters will be enrolled for this course and that the resulting discussions will bring forth much information of benefit to others in the class.

PRACTICAL MEN IN CHARGE

Mr. Cushman, who is to handle the group of non-transportation department men, assisted in conducting the course for training conference leaders at last year's convention, in which line of endeavor he has had a wide experience in connection with his work as chief of the industrial education service, Federal Board for Vocational Training, at Washington, D. C. Mr. Durgin, who will be in charge of the course for transportation men, is a former member of the Stone & Webster organization, and for the past three years has had direct charge of men using the conference method of training with large numbers of employees. In the conduct of the program as outlined Mr. Durgin expects to call to his assistance from time to time a number of men from the electric railway field who have had previous experience in work of this nature.

Engineering Nominations Made

IN ACCORDANCE with the provisions of the constitution of the American Electric Railway Engineering Association, its committee on nominations has presented the following names for consideration of the membership:

For president, Frank H. Miller vice-president and general manager Louisville Railway, Louisville, Ky.

For first vice-president, W. W. Wysor, chief engineer United Railways & Electric Company of Baltimore, Baltimore, Md.

For second vice-president, L. D. Bale, superintendent of power Cleveland Railway, Cleveland, Ohio.

Third vice-president, Charles H. Jones, general manager Chicago, South Shore & South Bend Railroad, Michigan City, Ind.

For secretary-treasurer, J. W. Welsh, general secretary American Electric Railway Association.

For executive committee: P. V. C. See, superintendent of car equipment Northern Ohio Power & Light Company, Akron, Ohio; F. McVittie, electrical engineer New York State Railways, Rochester, N. Y.; E. M. T. Ryder, way engineer Third Avenue Railway System, New York, N. Y. and Howard George, superintendent of research Cleveland Railway, Cleveland, Ohio.

All the nominees have expressed their willingness to serve the association for the ensuing year, if elected.

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News of the Industry

Arbitration on Eastern Massachusetts Completed

Arbitration hearings have been concluded at the State House in Boston on wages and working rules on the Eastern Massachusetts Street Railway system. The men are asking for a substantial increase in wages, without stipulating the specific amount desired, and they want certain concessions in the matter of discipline. The special arbitration board is composed of James J. Kerwin, of Lowell, who represents the general public and acts as chairman; Fred. A. Cummings, vice-president of the company, and James H. Vahey. Mr. Cummings reprerents the company and Mr. Vahey the carmen's union. These two men have acted in similar capacities for the company and for the union at several previous hearings. While Mr. Vahey acts both as arbitrator and counsel for the union, Mr. Cummings acts only as arbitrator for the company; Arthur G. Wadleigh, one of the public trustees, is serving also as counsel for the railway.

The hearings lasted from July 30 to Aug. 6, inclusive, and after the argument by counsel for both sides the board will take the case under advisement. The decision will be written by Mr. Kerwin and will be binding if one of the other arbitrators concurs in it.

Ten Cents and Ticket Rate in Schenectady

Permission was granted the Schenectady Railway, Schenectady, N. Y., by the Public Service Commission on Aug. 4 to increase its fares, fixing the rate at three tickets for 25 cents with a 10-cent cash fare in the city zone and an interurban zone rate of 10 cents, regular riders to be permitted to use tickets at the rate of 8⅓ cents per zone. The commission held that some form of a commutation fare should be established, and the company was directed to file a schedule with the commission which might become effective on three days' notice. The railway asked for a 10-cent cash fare. The present fare is 7 cents in Schenectady, with a like fare in its outside divisions. The commission says in part:

> The showing of the company's operations is such, as fully demonstrated by the low return which it is now earning, that no question need arise as to the justification of its claims for relief. It is questionable, however, whether a general fare of 10 cents with no special consideration for regular riders will not unduly restrict car riding to an extent prejudicial to the company. The commission has taken this attitude in other cases, and in no important city thus far has a general rate of 10 cents per passenger been allowed.

The commission in its determination holds that approximately $11,000,000 represented a fair valuation of the property used and useful at the present time. It further held that under the results showing operations of the company it was not necessary to fix a valuation of the company's property now.

The city of Schenectady objected to the jurisdiction of the commission because of the franchises granted to the company. An application to the Supreme Court for a writ of prohibition against the commission was denied by Justice Cropsey last February.

The city later agreed that the commission should examine the books of the company for 1926 and 1927. This was done and copies of the commission's reports served on the city and the company. A conference then followed between Schenectady and the company whereby the company's petition was submitted to the commission for decision without taking further evidence.

St. Louis Survey Under Way

New board appears fully to recognize magnitude of problems before it. Committees preparing to report utilization of streets and improvement of service

MAYOR Victor J. Miller of St. Louis, Mo., has named Charles J. Eisenring, business agent for the Carpenters District Council, as a member of the newly organized Transportation Survey Commission. Mr. Eisenring was selected to represent the City Plan Commission on the commission.

E. J. Russell, chairman of the commission, is also a member of the City Plan Commission, but was named to the transportation board as a private citizen so that he could be elected its chairman.

In commenting on the duties of the new board Chairman Russell expressed the belief that it should not confine its work to the city, but should study transportation needs of a community twice as large, including St. Louis County and the district on the east side of the Mississippi River. He said in part:

> The ordinance creating the commission requires it to study all forms of transportation for the present and the future. Air transportation, electric traction, motor vehicle, steam railway and river traffic are included in the scope of the work. A study of this kind, to be complete, must extend beyond the political boundaries of the city and should be for the metropolitan district which includes the city, portions of St. Louis County and of Madison and St. Clair Counties in Illinois. In order to make the work effective, the co-operation of the counties should be invited.
>
> In St. Louis County the problem would be practically that of adequate highways; for Madison and St. Clair, mutually satisfactory locations for future bridges across the Mississippi River.
>
> The commission should familiarize itself with the fundamental principles of adequate transportation facilities and should endeavor to approach as nearly as might be reasonably possible an ideal system.
>
> Surveys have been made of the electric railway problem and the reports on them should be analyzed as they will save a great deal of time and it is unnecessary to duplicate the excellent work previously accomplished. Rapid transit is a phase of the problem because it involves new and costly construction if it takes the form of subways or elevated, or a combination of both.
>
> If private ownership is decided upon, franchises need careful scrutiny. Financing of the cost of new construction and of its upkeep afterwards will have a bearing on the fares to be paid, and while they are established by the Public Service Commission, it will be influenced by the facts in the case.
>
> Vehicular traffic covers passenger cars, trucks, buses, taxis and service cars. Are existing and contemplated streets adequate to serve the purpose? What is the answer for congested traffic intersections? An extension of one-way traffic streets may become necessary. Tourists should be provided with proper facilities for entering and leaving the district. Trucking is constantly on the increase and should largely be separated from passenger traffic.
>
> In looking ahead for future needs, the commission might well bear in mind the fact that the population in the metropolitan district will double itself within 25 years, and the solution of the problem might well be based on this growth. This would seem reasonable in view of the strategic position of the district from a geographic and railroad standpoint, the ultimate development of the river traffic, the ability to coke the Illinois coal and the accessibility of an almost exhaustless supply of iron ore.
>
> The survey should be made by competent and experienced men, selected only after mature deliberation. The work of the commission will be valueless unless it is sold to the citizens. Organizations and individuals should be invited to make suggestions. As the work advances the people should be informed of the progress.

He named two sub-committees, one to study and report on the utilization of the streets in the speeding up of traffic and the second to consider the improvement of surface street car service.

Director of Streets and Sewers Brooks informed the commission that four plans have been evolved that will eliminate about 10 miles of street car tracks and by adding 2½ miles of new tracks the service as a whole will be improved and cost of operation and maintenance reduced.

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Samuel W. Greenland, representing the St. Louis Public Service Company, said that while St. Louis cannot complete subways for more than five or ten years, many improvements in down-town conditions can be made immediately. Some of these changes, such as one-way streets, would not require any alterations in the preesnt trackage, and would greatly speed up traffic in the congested areas.

Making Good Use of Obsolete Cars in Cincinnati

The Kiwanis Club of Cincinnati will sponsor erection of a machine shop and woodworking shop, together with school rooms, to be constructed out of old cars of the Cincinnati Street Railway at St. Edmund's Home for Boys in Glendale, a town near Cincinnati. Hudson R. Biery, Cincinnati, director of public relations of the railway, announced that the cars would be removed to Glendale for the purpose when taken out of service at the Winton shops of the company the week of Aug. 12. The cars were purchased for them by a friend of the boys' home.

Report Expected in Portsmouth

W. B. Brady, vice-president of the Portsmouth Public Service Company, Portsmouth, Ohio, is making a personal survey of conditions in that city prior to presenting a report to the owners of the company. In a statement Mr. Brady said that the company had been losing money for the last seven years and was now unable to finance any improvements. In fact, the situation was so bad that it was a question of how long operations could continue under the present conditions.

The Portsmouth City Council recently ordered the company to improve the streets along the company's tracks.

Catching the Frauds on Maryland Line

As a means of combatting those who make improper use of commutation books, the Washington, Baltimore & Annapolis Electric Railroad, with headquarters in Baltimore, Md., has started the rigid enforcement of a rule which provides that the commutation tickets be detached by the conductors. On every commutation book sold by the company on and after Aug. 1 appeared a sticker bearing the following: "Conductors have been instructed to personally detach coupons. Please, therefore, allow him to detach them."

The conductors were notified to refuse to accept tickets detached by the patrons. Should any be detached by the rider they must be properly stamped by an official. Numerous cases of improper use of the books have been reported, one conductor apprehending a patron who attempted to use tickets issued three years ago.

Subway a Real Civic Undertaking

Architects and engineers named on committee to plan proposed Chicago system. Assessment idea favored

—Courtesy of Chicago *Daily News*

In consultation: David H. Wallace, Harvey A. Fleming, C. M. Mock, Horatio B. Hackett, representing John A. Holabird; Ernest R. Graham, Michael J. Faherty, president of the board of local improvements; Benjamin H. Marshall and E. J. McIlraith.

LEADING architects and engineers have pledged Michael J. Faherty, president of the board of local improvements, active assistance in the drawing of architectural plans for a complete Chicago subway system and the drafting of the engineering specifications. As a result a committee of seven—three architects and four engineers—has been appointed to work out the general scheme for the subway. The committee is headed by Ernest R. Graham, architect. The other two architects appointed are John A. Holabird and Benjamin H. Marshall. The four engineers are Harvey A. Fleming of the south side lines; E. J. McIlraith, the Chicago Surface Lines; C. M. Mock of the elevated system and D. H. Wallace, city engineer.

Mr. Graham said the committee will determine what they believe the best general scheme for Chicago. Results will be compared with previous efforts.

The work of the committee will be started as quickly as possible, he said, and will not be confined to a State Street subway, but to a comprehensive system. When the members are ready to report they will notify Mr. Faherty and another conference will be called.

Mr. Faherty said that before actual work is started on so gigantic an enterprise as a subway "the plan of construction should be made not by any administration, board of local improvements or other local body but by a committee of competent and able men representing all of the groups interested, such as property owners, transportation companies and the city."

After informing those present that they were not called together to discuss whether a subway can be built by special assessment, Mr. Faherty explained how, in his judgment, a subway can be built out of the traction fund and at the same time permit that fund to remain intact and available for any other purpose that may arise. He said:

The city already has the money from which a subway can be built. We will say for the sake of argument that the first unit will cost $40,000,000 and we further say that 25 per cent of it will be public benefit and the other 75 per cent charged against the property in the assessed district, and we will say that the assessment for the first unit is to extend from 22d Street to North Avenue and from the lake to the river. We will say that $30,000,000 of this will come from the property owners and $2,000,000 as a public benefit to be paid by the general public.

This special assessment paper can be deposited with the comptroller and the law enables the comptroller to loan 100 per cent of it to the board of local improvements. When the board of local improvements deposits its special assessment paper with the comptroller it signs an agreement that when the assessments are paid by the property owners the money will be turned over to the comptroller and credited to the traction fund. In this way the traction fund will be secure, as it is not possible to lose a dollar in the assessed district and the money will be drawing 5 per cent interest.

The $10,000,000 that are the city's share of this improvement, known as a public benefit, should be treated like any other indebtedness of the city of Chicago, like building a fire department house or a bridge. This money would have to be paid out of a general bond issue submitted to the people for approval and then credited to the traction fund.

In this way, the contractor will not have to submit his special assessment paper to the banker and receive 94 to 97 cents on the dollar. When the contractor knows that cash will be paid and that he can pay for his material and labor in cash, we will get the best bids possible for the construction of a subway.

It is safe to say that at least 25 per cent of the assessment will be paid the first

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year and possibly 50 per cent in two years. The money can then be used in the construction of another unit, and in that way the traction fund can be used and reused to construct subways and pay cash to the contractors.

Inasmuch as the banks are willing to take special-assessment and public-benefit paper, there is no reason why the traction fund cannot be used in this way. By doing this the traction fund, instead of being idle as it has been, will enable the city to utilize this fund for subways and at the same time allow it to remain intact and available for any other purpose that may arise. Borrowing from the traction fund is not anything new. It has been done frequently by the board of local improvements, with no loss to the fund and, I think, with great benefit.

As indicated in the JOURNAL for July 28, page 154, Mr. Faherty suggested that to determine the legality of building a subway by special assessment, a judge familiar with the special assessment law, might sit two hours a day, two or three times a week, for the next five months and listen to the city's attorneys argue that such action is legal.

Extension Over Detroit United Track

The utilization of Detroit United Lines tracks to some of the outlying districts is enabling the Department of Street Railways at Detroit, Mich., to weld the two systems into one composite structure, with a view to rendering a greater service to patrons residing in suburban localities.

A decided step in this direction was taken on July 29 when the Grand River car line was extended to Farmington, a distance of approximately 18 miles from the City Hall, Detroit, under an agreement entered into between the Department of Street Railways and the Detroit United Lines, whereby cars of the municipal railway operate over the D.U.L. tracks from the Seven-Mile Road to Farmington.

The coach service operated by the street railway to Farmington has been discontinued, but the coaches thus released will be utilized in other districts where service is planned by the department.

The new service to Farmington has many advantages over the old method. The all-rail line is more economical than the coach line since the tracks were already in location and the transmission system in order. Moreover, the service is more convenient than taking the street car to Seven-Mile Road and going thence to Farmington by coach, a route formerly traversed by many.

The tracks from the Seven-Mile Road to Farmington have been idle for more than two years, but under this new régime they ought to prove not only a boon to patrons, but a profitable enterprise as well. The new plan is believed to be an initial step in service to outlying communities that will, it is hoped, be more and more adequately served in the future, through the medium of Detroit United Lines tracks and the Department of Street Railway cars and coaches.

Review of Athol-Orange System

First municipally owned Massachusetts railway, a 7-mile road, appears to be doing well

THE first municipally owned street railway in Massachusetts, the Athol & Orange Transportation Area, is entering its fifth year with a remarkable record. In four years the Area has carried 200,000 school children without an accident. In 1927 not an accident claim of any kind was made against the railway. This is considered remarkable as it operates 7 miles of track over the Mohawk Trail, one of the heaviest travelled roads in the state.

George S. Donley, superintendent, believes safety comes first and service second. Safety and service, however, go hand in hand and service does not need to be sacrified to safety nor safety to service. A motorman would not think of letting a school pupil out in a whirl of auto traffic. If the need seems to warrant pupils are assisted on and off the cars. Safe stops are planned.

Two miles of new roadbed have been completed and work has been started on the rest between the two towns of Athol and Orange. New feed wires, bonds and switches are included in the program. The carhouse has been improved with a new stock room, car repair pit, paint room and minor improvements to facilitate handling of cars.

None of the large cars is new but they have the appearance of new cars. The car rehabilitation program has been an extensive one and will continue to be, Mr. Donley said. This long-term operation is considered exceptionally good as the cars run over hilly country, with several grades as severe as 15½ per cent. Hourly service is given on the main line except on Saturdays, when half-hour service is operated.

The Area was taken over by a vote of the town of Athol in 1923 and stands as only one of two roads taken over by towns since an act of the Legislature was passed, giving such authority. The road originally was the Athol & Orange Street Railway. Later when a loop connecting Springfield, Greenfield, Worcester and Fitchburg was planned it was taken over by the Northern Massachusetts Street Railway. When the last-named company went into receivership an order of the Supreme court was issued to close out. Actual operation under the town was begun on March 23, 1924, with Mr. Donley as superintendent. He had been a platform man beginning March 27, 1895, for the old Athol & Orange Street Railway, but took over the management of Brookside Park, an amusement resort in Athol in 1920.

The Area is operating with a 10-cent minimum fare, selling ten tokens for 50 cents. After the first zone, users of tokens pay one token for every zone thereafter. A half-rate issue is made for school children and the school tickets are recognized not only during school hours but through all hours of the day and during the summer. Interest has been paid regularly on the bonds. A small reserve is kept and the balance put back into equipment.

It is a watchword of the employees that people along the route can set their timepieces by the cars, since service is so near the dot.

A Mile an Hour Increase in Pittsburgh

Efforts are being made by the Pittsburgh Railways, Pittsburgh, Pa., to improve service by increasing the average speed to about 9½ m.p.h. The changes are represented as having been made practical at this time because the large number of company and public improvements have made for fewer delays and better operating conditions generally. Among the other contributing factors are more adequate power supply, at vital points, and the use of cars particularly suited to a given service.

Thomas Fitzgerald, vice-president of the Pittsburgh Railways, issued the following statement:

Our efforts may be described as an attempt to maintain and improve service in spite of a marked decrease in traffic and earnings. Additional adjustments will be necessary if we are to discharge our obligations to the city and other municipalities. In the event of improved earnings or operations, service will be improved accordingly. We certainly regret the necessity of adjusting operations and the number of employees to the seasonal traffic conditions and to decreased earnings.

The prompt movement of street cars in Pittsburgh has been slightly improved, so that we hope to make the average rate of speed 9½ m.p.h., less than a mile an hour increase. An increase in car speed has been made imperative by the demands of the car riders. If service is to keep pace with the improvement required by the public, cars must take them where they want to go within a reasonable time.

In the past congestion on Pittsburgh streets has slowed down the movements of trolleys considerably. Now that public and company improvements have in some measure relieved this, we hope to return the cars more nearly to the schedules formerly maintained. At one time the street car was the fastest moving vehicle on the streets. Now it is the slowest except for the horsed vehicle.

The car riders of Pittsburgh have provided, through the railways, more than $1,500,000 in improved power facilities; $4,500,000 in reconstructing the tracks of the railways, and about $5,000,000 in new cars—simply to improve operations and furnish a service adequate with the demands of the car riders. These expenditures have been made since 1924.

It is true that by Aug. 6, 220 of more than 2,900 trainmen will have been placed on the extra list—not 500. The present depression in business conditions—reflected in railway revenues—makes imperative not only improvements but economies, as has been the experiences of many businesses under similar conditions.

The improved schedules are based on careful observations of actual performances under present traffic conditions, with the factor of safety always in mind. Where schedules have been improved, the improvement in automobile as well as street car movement has been very noticeable.

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Stimulating Sales on the Pacific Electric

D. W. Pontius, vice-president and general manager of the Pacific Electric Railway, Los Angeles, Cal., has announced a new form of monthly pass to to be sold at $13 to regular commuters in Long Beach, Wilmington, San Pedro, Alamitos Heights, Redondo Beach and El Segundo. The new tickets will be made permanent only if after a trial period of 3 months they are regarded as sufficiently popular to warrant their continuance.

Sold at a lower rate than the 60-ride commutation ticket book, the new pass is good for an unlimited amount of transportation for the purchaser and members of his family. It further effects a considerable saving to the user through the privilege carried with it of free transportation within the 5-cent zone of both the city selling point and Los Angeles. The pass is good for use only by one person at one time on any train.

Shorter Week Sought in Seattle

Nearly 1,400 employees of the Seattle Municipal Street Railway, Seattle, Wash., are concerned in a request for a week of 5½ days made to the City Council recently. The city can grant their petition without any considerable addition to the expense of operating the street car and bus service, W. E. Carpenter, secretary-treasurer of the railway employees' organization, declares He said that the street car and bus men were now getting only one day in eight off from work, which was not enough to give them the rest and relaxation that they should have.

The request for the shorter work-week was made in a communication to the City Council from local Division 587 of the Amalgamated Association. It urged upon the Council the fact that "there is nothing in which labor is more vitally interested than in fewer hours and fewer days of daily toil whereby are afforded leisure and recuperation and opportunity for the things that make life worth living."

Travelers Guide in New Jersey

"Where to Go and How to Get There," a pocket-size guide, is soon to be issued, showing bus and railway service between Newark, N. J., and all other points in that State, as well as important cities in New York, Pennsylvania, Delaware, Maryland, the District of Columbia and other nearby States with which there is direct communication.

The guide will be published monthly by Criterion Service, Inc., 1060 Broad Street, Newark. It will contain about 50 pages of timetable information arranged alphabetically by destinations. To insure accuracy and reliability the contents will be compiled and printed under the supervision of men of long experience in the transportation field. About 50,000 copies of each issue will be distributed free at the terminals of all lines centering in Newark, at hotels in the local territory and at designated places adjacent to heavy traffic points. In addition to the timetable data, pages will be devoted to shopping and amusement information. The first number will appear early in September.

Would Increase Fare on Jersey Line

The Cumberland Traction Company, operating between Bridgeton and Millville, N. J., has applied to the New Jersey Board of Public Utility Commissioners for permission to increase the rate of fare between the two towns from 35 to 45 cents. The line is 10 miles long.

South Shore Methods Attracts Riders

To induce summer riding the Chicago, South Shore & South Bend Railroad has put into effect a reduced week-end rate from South Bend to Chicago and return for $4 and $2 for children. This is only one of the features of the new summer services which includes half-hour service during week-ends between Chicago and Michigan City and eight new trains, several operating on extra fast time. The accompanying advertisement shows still another way by which the South Shore is making an effort to stimulate the use of its service. The service as advertised in the daily press is very effectively displayed in space 8x12 in. One of the Chicago agencies is handling the advertising account.

Two Bells in Los Angeles with Changed Appearance

In tne opinion of officials of the Los Angeles Railway, Los Angeles, Cal., the time is now at hand for *Two Bells,* the weekly publication of the road's employees, to take its place with full-grown publications that are issued monthly. Accordingly, with a change in make-up but still serving as a herald of good-cheer and fellowship, the first of the new series will make its appearance on or about Sept. 10.

Rehearing in Stockton Denied

The California Railroad Commission has denied the petition of the City of Stockton for a rehearing of its recent order fixing the rates for the Stockton Electric Railroad. A one-way single cash fare of 7 cents between all points on the company's lines and four tokens for 25 cents were authorized by the commission.

Safety the Subject of Comment In the Society Column

The Chicago Surface Lines has broken into the society column of the Chicago *Tribune.* Madame X, after reviewing the safety banquet at the Stevens Hotel last May which was the subject of treatment in the JOURNAL, said that the awarding of the safety buttons "will mean more to you when you know that the Chicago street cars covered more than 136,000,000 miles last year with a 12½ per cent reduction in the number of accidents of the record of the previous year."

The commentator then continued as follows:

This is in spite of the fact that it has the world's highest speed average, which is 11 m.p.h., while the average elsewhere is 8 m.p.h. It has 1,070 miles of track, over which it runs 3,539 cars, carrying 892,000 revenue passengers a day, which is 500,000 more than all the rest of the railroads in the country carry in the same period of time. For three successive days at Christmas time last winter, every car owned by the surface lines was in continuous use. These cars carry many more passengers per diem than the elevated and bus lines put together. Eighteen thousand men are employed, of whom 12,000 are motormen and conductors. It is said to be the largest railway of its kind in the world, and the best run.

I got all this information from Guy Richardson, vice-president, and he gave the facts to me because of a remark made some time ago in this column that if we didn't get a subway by the world's fair year the city's transportation problem would be overloaded and break down. I'm glad I made the statement, as I had, thanks to John Chapman, a pleasant chat with Mr. Richardson, and learned much about the workings of our surface lines.

Nevertheless, I still think that if we don't enlarge our street railway traffic facilities we shall be swamped with the traveling public in 1933, or if not, it will be because people don't come to our world's fair.

The street railways officials say that their motormen all have to undergo each year a thorough examination for their fitness to drive a street car, and suggest that similar methods in dealing with drivers of the much more deadly and dangerous automobiles would do more to diminish our present appalling accident list than any speed laws and other inefficient regulations.

Madame X then went into the subject of the conditions imposed in other states, reciting the rigid requirements to be met before an operator's license is issued to the prospective applicant.

Increase in Detroit Municipal Fare Unlikely

Del A. Smith, general manager of the Detroit Municipal Railway, Detroit, Mich., addressed members of the U. and I. Club at luncheon in the Detroit-Leland Hotel recently as follows:

We are extremely confident of continuing with the present 6-cent fare. When we took over the D. U. R. lines in 1922 we were indebted to the extent of $42,000,000. That debt will be wiped out in 1931 and thereafter we will enjoy a $2,000,000 annual increase in the net income of the D. S. R.

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Believing that "a stitch in time saves nine," we are now repaving and laying new tracks on many lines of the city. For four years following the acquisition of the system by the city the railway lines were merely patched. At the end of that period we found ourselves exactly in the same place that we started. A year and a half ago we started to concentrate on the main lines. Jefferson Avenue is now completed at a cost of $180,000 and will not need attention for at least ten years.

Instead of repairing trolley wires after they are broken, we now inspect them regularly and when one shows signs of wear it is immediately replaced. When we took over the lines, the number of such delays averaged 80 per month. So far this month we have experienced only one break which delayed the car 18 minutes.

The Detroit railway system is today valued at $60,000,000, a gain since 1922 of $28,000,000.

Public Speaking Important Branch of North Shore Line

The North Shore Line Public Speaking Clubs, sponsored by the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., filled 132 engagements during the second quarter of 1928 and spoke before an aggregate audience of 15,942 persons. The period was one of the most active in the history of the organization. The clubs took a prominent part in the safety campaigns conducted in their territory. Their work in this connection brought a letter of commendation from G. F. Loomis, superintendent of schools in Kenosha, Wis.

Defends One-Man Car System for Cincinnati

In connection with recent complaints to the Cincinnati City Council against the use of one-man cars on a certain Cincinnati line, E. D. Gilman, municipal utilities director, stated on Aug. 6 that he had received a report from Kansas City showing that that city now uses nothing but one-man cars, permitting a saving of about $500,000 annually in cost of operation compared with the two-man system. Mr. Gilman pointing out that both Cincinnati and Kansas City were hilly cities and that conditions were therefore comparable, further observed that all savings on operating costs in Cincinnati would be put back into improvements under the service-at-cost arrangement.

The Personal Element in Richmond

The Virginia Electric & Power Company, Richmond, Va., recently instituted the custom of carrying the name of each street car and bus operator in big letters on a card inserted in the front of the fare box. The custom is designed to assist the passenger in identifying the operator and to add a personal touch which, it is believed, will work for better service on the part of the employees and promote friendly relations between the riders and the company.

Recent Bus Developments

From Kalamazoo to Grand Rapids by Bus

Kit F. Clardy, assistant attorney-general of Michigan, and Charles B. W. Aldrich, assistant United States attorney, representing the Michigan Public Utilities Commission and the Interstate Commerce Commission, respectively, have attacked the proposal to abandon the western division of the Michigan Railway in briefs filed in United States district court.

Mr. Clardy maintained that the federal court has no authority to issue an order permitting the abandonment of the line. Mr. Aldrich said that as the company has interstate connections, the question rests with the Interstate Commerce Commission. The matter of state jurisdiction also was stressed.

Mr. Aldrich also said if the United States court holds it has the right to decide the abandonment question, it will open the door to breaking down the power held by the Interstate Commerce Commission in settling questions of interstate transportation. The Public Utilities Commission, maintaining the constitutional rights of Michigan in the question, says it is best qualified to pass on the matter.

The western division runs from Kalamazoo to Grand Rapids and from Allegan to Battle Creek. There is a spur from Battle Creek to Camp Custer. The company, in its petition sought to abandon the division. Its plea was made through John F. Collins, of Jackson, receiver. The company offered to run buses over the route of the electric lines.

Permit Would Jeopardize Existing Services in Missouri

The Missouri Public Service Commission on Aug. 1 denied the Egyptian Transportation System of Marion, Ill., a certificate of convenience and necessity for the operation of buses between down-town St. Louis and Kirkwood. Last February the company applied for the bus permit and final hearing was held by the commission on April 11.

Besides steam railroad protestations the St. Louis Public Service Company also entered the case, since this bus competition affected its railway lines from St. Louis to Maplewood, Webster Groves and Kirkwood.

Barney W. Frauenthal, general traffic manager for the railway, testified the bus route paralleled the railway and duplicated its service. He also stated that after 6 p.m. the St. Louis Public Service Company supplied the only public transportation to this territory and that if the heavy peak traffic of the morning and evening were taken away from the car line its revenue would continue to be depleted. He said that the line from St. Louis to Kirkwood had not shown a profit in eight years.

The state commission ruled that to grant the permit sought by the bus company would be inequitable and unjust to the electric railway and to the Missouri Pacific and the St. Louis & San Francisco Railroads.

Mid-State Coach Lines to Be Sold

Equipment of the Mid-State Coach Lines, Inc., Syracuse, N. Y., will be sold at public auction on Aug. 15 by R. S. Messenger, Auburn, receiver of the company. The equipment includes ten of the 21-passenger buses, five trucks, three buses, two for seventeen passengers and one for twenty-nine; two automobiles, a truck and snowplow attachment, garage tools, equipment and supplies. The sale will include permission to operate buses in Syracuse and several towns in Onondaga and Oswego Counties subject to the approval of the Public Service Commission. The Rochester & Syracuse Railroad, the Empire State Railroad, the Auburn & Syracuse Electric Railroad, and the Syracuse Northern Electric Railway, Inc., are all interested in the coach company.

New Plan in Knoxville to Go Before Council

The appearance of S. A. Markel, chairman of the legislative committee of the American Automobile Association in Knoxville, Tenn., led the Knoxville *News Sentinel* to associate his name with the group of engineers who are making a survey of the new routes proposed by the Knoxville Rapid Transit Company, which is petitioning the City Council for a franchise to operate an independent bus system in that city. The new system is a revision of the ten-route plan laid out by Earl O. Mills, engineer for Bartholomew & Associates, and proposes eight instead of the former ten routes.

Meanwhile, no action has been taken by the City Council on the proposition advanced by the Knoxville Power & Light Company for the operation of buses in co-ordination with street cars.

Seeks Permission to Run Buses on Jersey Line

The Public Service Railway, Newark, N. J., has asked the City Commission of Bordentown, N. J., for permission to run buses through that town in connection with the already established railway lines. The company intends to operate the buses on a regular schedule there, articulating the service with that of the railway. Action on the matter was laid over.

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Financial and Corporate

Augusta System to Pass to Southeastern Power

An offer was made recently by the Southeastern Securities Company, through which it is expected the company will acquire control of the Augusta-Aiken Railway & Electric Corporation. This will mean that the Augusta Company will become a part of the group of operating companies controlled by the Southeastern Power & Light Company.

The plan is to co-ordinate the operation of the Augusta-Aiken company with that of Georgia Power Company in Georgia, and South Carolina Power Company in South Carolina, and with the interconnecting system of the Southeastern Power & Light Company, extending through Alabama and Georgia. There is an electric transmission line connection at the present time, but the full benefits are not realized under separate control.

F. Bayard Culley, general manager of the Augusta-Aiken Company, issued a statement in which he said in part:

For the past two years the Augusta Company has been connected with the interconnected transmission lines of the Southeastern and has enjoyed the benefits of this association through the Georgia Power Company. However, this relationship has been in the nature of a buyer of power. It it true that all of our power requirements have been met by the Atlanta Company, but still we were simply a customer.

For the future we are a part of that system which now occupies the greater part of the State of Georgia and which is connected with the power resources of the State of Alabama, largely centered around Muscle Shoals. These connections with the large producing companies of the Southeastern System assure for us an unlimited supply of power for the territory served by the Augusta-Aiken Company.

In addition to all this, we will be directly connected with the $20,000,000 power project to be constructed on the Savannah River above our Stevens Creek Power Development.

I anticipate that the acquisition of the Augusta-Aiken Railway & Electric Corporation by the Southeastern Power & Light Company will be of value to the patrons of the company and to its employees.

St. Paul Southern to Be Resold

Judge Albert Johnson of Dakota County, Hastings, Minn., has ordered resale of the St. Paul Southern Railway. Operation of the road was discontinued July 31 pending a decision as to who bought the line at a previous sale. C. Rieger of St. Paul bid $30,250 and was awarded the line by the receiver, C. P. Kuckler. C. A. Davis of Minneapolis said he did not hear the receiver's acceptance and bid $30,750. Meanwhile the Minnesota Railroad & Warehouse Commission will have a hearing Aug. 13 in St. Paul upon application of the receiver to abandon the line. He said it is the plan of either purchaser to junk the road.

Automobile travel and bus transportation have cut down receipts of the line. The road has lost money since 1923 and has been operated by a receiver since Sept. 28, 1918. It was built in 1914 at a cost of $600,000 and operates 18 miles of track. Bus lines now operate five round trips to Hastings.

Separate Report on Railway Operations in Havana

As a result of the general economic condition and of bus competition, the earnings of the Havana Electric Railway, Havana, Cuba, have been seriously affected, and a policy of rigid economy was undertaken during 1927. However, care was taken that the economies introduced were not at the expense of the physical condition of the property, nor in any manner prejudicial to the proper upkeep. Thus does F. Steinhart, president, in the annual report explain the trying situation in Cuba.

The report of operations of the company shown in the accompanying statements covers the period from Sept. 1, 1926 (the date on which it began to function independently of the Havana Electric Railway, Light & Power Company) to Dec. 31, 1927 and as the calendar year has been adopted as standard by the company, a financial statement is contained for the calendar year 1927.

The Havana Electric Railway as now organized operates the tramway system in Havana, together with the interurban line known as the Insular Railway, and also the tramway systems in Santiago and Camaguey, all on the island of Cuba. The number of passengers carried in 1927 was 115,712,035. During the year, approximately 800 buses were operated in the city of Havana and adjoining districts in competition with the railway. Passengers are carried for 5 cents from and to these outlying districts. The result has been that many riders are now being brought into Havana by the buses for 5 cents who would normally have been delivered to the railway at the terminals by the buses acting as feeders.

RESULTS OF OPERATION OF THE HAVANA ELECTRIC RAILWAY

	Four Months Ended Dec. 31, 1926	Year 1927	Total
Gross operating revenues	$2,116,285	$6,020,679	$8,136,965
Operating expenses including taxes	1,690,172	4,814,609	6,504,781
Net revenues from operation	$426,112	$1,206,070	$1,632,183
Net non-operating revenues	11,564	52,264	63,828
Gross corporate income	$437,676	$1,258,335	$1,696,012
Interest and other charges	214,637	643,893	858,530
Net divisible income	$223,039	$614,442	$837,481
Out of the net divisible income for the period under review, namely			$837,481
There has been set aside as depreciation reserve			128,000
Leaving a balance of			$709,481
The following disposition was made thereof:			
Dividends paid during the period on the preferred stock (at the rate of 6 per cent per annum)			$375,000
Balance carried forward			334,481
Total			$709,481

HAVANA ELECTRIC RAILWAY

	Four Months Ended Dec. 31, 1926	Year 1927	Total
Gross receipts from all sources	$2,127,849	$6,072,944	$8,200,793
Total deductions for operation, maintenance and accrued taxes	1,690,172	4,814,609	6,504,781
Net additions to property account	21,487	135,806	157,293
Total number of railway passengers carried	40,970,603	115,712,035	156,682,638
Passenger car-miles	7,004,815	21,521,652	28,526,467

Cites Lack of Municipal Railway Program

Considerable space is given by M. M. O'Shaughnessy, city engineer of San Francisco, to the electric railway situation in that city, in his report for the year ended June 30, 1927, just issued. Thus he calls attention again, as in the report for the previous year, to lack of any city plan of action when the franchises of the Market Street Railway expire. He urges the appropriation of money by the city to permit the Department of Public Works to make a study of the situation. Nothing has been done either, he says, as to any policy of acquiring the California Street System, although the franchises of that company expire February, 1929.

Referring to the Municipal Railway, Mr. O'Shaughnessy says that no extensions were made to it during the past year, and none can be made from surplus funds derived from the operation of the line, as in the past, because for some years there has been no surplus. For the year ended June 30, 1927, the operating ratio of the municipal line was 84.7 per cent, leaving a margin of only approximately 15 per cent to cover interest charges, depreciation, and other items. The suggestion of the city engineer, made March 31, 1927, for a $4,700,000 bond issue for extensions, new cars, buses, shops, etc., was denied at an election held in June, 1927.

Six buses used for giving service on the Embarcadero Line were run at a loss of about $18,000 a year. This loss, however, will be covered by a subsidy from the Harbor Commission, which is interested in keeping this line in operation. Altogether 19 buses are now in use, but garage facilities for them are greatly needed. During the year ended June 30, 1927, 15 new elec-

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tric cars were put in service. They cost $18,316 each compared with $7,000 for almost the same type of car bought in 1914. The document in which Mr. O'Shaughnessy's comments are contained is the regular report of the bureau of engineering, a 104-page booklet adequately illustrated.

Indiana Merger Approved by Stockholders

Approval of the proposed merger of the Terre Haute, Indianapolis & Eastern Traction Company and the Central Indiana Power Company was voted at a meeting of the stockholders at Indianapolis on Aug. 1. Similar action was taken at a meeting of the stockholders of the Terre Haute Traction & Light Company, the traction subsidiary.

The consolidated properties will be known as the Indiana Electric Corporation and in it the Insull interests will participate. The railway lines have been controlled by the Randal Morgan interests, of Philadelphia, since their construction. They include more than 450 miles of tracks crossing the state from Richmond on the east to Terre Haute on the west. The company also has lines from Indianapolis to Martinsville and Crawfordsville and a leased line from Indianapolis to Lafayette.

The Public Service Commission will be asked to approve the merger.

A resolution permitting the sale of the Eastern Division of the railway, to a separate corporation was adopted at the meeting.

The merger has been the subject of detailed analysis previously in ELECTRIC RAILWAY JOURNAL.

Abandonment Allowed in Sherrill

The Public Service Commission on Aug. 1 approved a declaration of abandonment by the New York State Railways of 11.2 miles of its system in Sherrill. Approval is conditioned upon forthwith removal of track and structures from the highway and restoring the highway for traffic.

Service has been discontinued since Aug. 29, 1927, hourly bus service now being given, connecting Sherrill, Kenwood and Oneida.

Dividends Passed by New Bedford Company

Directors of the Union Street Railway, New Bedford, Mass., on July 19 passed the dividend due to be paid on Aug. 1. Quarterly dividends of $1.50 a share have been paid on the stock since the beginning of 1926. Prior to that 8 per cent annually was paid. In commenting on the action of the directors, E. S. Wilde, president, said that "owing to the local textile situation during the last quarter patronage has decreased to such an extent that the company has not earned its dividend."

Progress in Buffalo

Tangible evidence that rehabilitation work of Mitten Management on International Railway is bearing fruit. Employees increase their holdings of company securities

CONTINUED improvement in the financial position of the International Railway, Buffalo, N. Y., under Mitten Management is shown by the semi-annual income account reproduced in ELECTRIC RAILWAY JOURNAL for Aug. 4. For the first six months of this year the company earned $240,031, compared with a deficit of $176,271 for the similar period last year. Operating revenue was $5,538,871 compared with $5,423,725 for the similar period last year, while there was a decrease in expenses and taxes from $4,901,174 last year to $4,637,947 this year.

The statement reflects the benefit of recent financial changes authorized by the Public Service Commission, since the 1927 figures include an amortization charge of $167,879 discontinued on Jan. 1, 1928. The figures indicate that the improvement is due in part to an increase of $115,000 in passenger revenue, and in part to greater economies and efficiencies.

After the meeting of the board of directors B. J. Yungbluth, president, announced that the equity of holders of I.R.C. 5 per cent refunding and improvement gold mortgage bonds is being substantially improved through the retirement this year of six issues of underlying bonds. Holders of these bonds totaling $600,000 have taken in exchange I.R.C. preferred stock, a $2,000,000 issue of which was recently authorized by the Public Service Commission. The bonds retired in this manner include $60,000 Tonawanda Street Railway, $12,000 Niagara Falls, Whirlpool & Northern Railway, $488,000 Niagara Falls & Suspension Bridge Railway and $40,000 Tonawanda Electric Railway. In addition, through the operation of a sinking fund under the I.R.C. mortgage, $300,000 underlying bonds of the Niagara Falls & Suspension Bridge Company and of the Clifton Suspension Bridge Company have been retired at maturity, while $125,000 bonds of the Lewiston Connecting Bridge Company and the Queenston Heights Bridge Company will be similarly retired at maturity on Oct. 1. Last year $215,000 of Buffalo, Bellevue & Lancaster Railway bonds were also retired. As of June 30, 1928, there was outstanding only $8,432,000 of underlying bonds.

Of the $2,000,000 issue of 7 per cent preferred stock authorized by the Public Service Commission to replace temporary financing with permanent financing, and to reimburse the treasury for capital expenditures, $1,600,000 has been sold. Dividends as declared are payable on Sept. 1 and March 1. Since the stock was issued May 1, the directors on Aug. 1 declared an initial dividend for four months of 2⅓ per cent, payable on Sept. 1 to stock of record Aug. 20. No dividend has been paid on the common stock since 1918. Under Mitten Management, however, operating deficits have been steadily reduced, and for the last two years the company has shown a net income.

In commenting on the improvement of the I.R.C. financial position President Yungbluth said in part:

> The transition from a loss to a gain has benefited the public, the employees and the owners. Resulting improvement in the company's credit has made possible many service betterments. I.R.C. service today is substantially better than Public Service Commission requirements. In spite of crowded streets, more than 90 per cent of I.R.C. cars are on time. The cars are in better condition, cleaner, and better painted than ever before. Last year and this year track and paving maintenance and reconstruction expenditures have totaled $1,425,000. Improvements have been so marked that recent advertising of Buffalo's advantages as a site for industry has made mention of the excellent transit service available.
>
> The employees who now own 11 per cent of the common stock, 2,000 shares of the preferred and $550,000 par value of I.R.C. bonds have been benefited by steady increases in market value of their holdings and in the security behind their equity, while the other owners of the property who are waiting and have been waiting since 1918 for dividends on their common stock have also benefited by the improved market value of their securities.
>
> The splendid improvement in the relations involving the city, the public and the company has resulted in the development of a fuller understanding of the fact that to give good service the company must be in sound financial condition. As the spirit of co-operation among the city, the public and the company continues to grow, the advantages already secured will become even more generally recognized that Buffalo and the Niagara frontier have the best transit service in New York State.

$309,403 Available in Sacramento for Surplus

The Sacramento Northern Railway, Sacramento, Cal., reports to the Railroad Commission its 1927 operating revenue at $1,541,605, compared with $1,569,482 for 1926. Operating expenses, excluding taxes for 1927, are $1,190,080 and $1,181,297 for 1926, leaving a net operating revenue of $351,525 for 1927, and $388,185 for 1926. During 1927 taxes charged to operation amounted to $101,618, and for 1926 to $81,824. Deducting the taxes leaves operating income of $249,906 for 1927 and $306,361 for 1926. Adding to the operating income, the non-operating income of the company and deducting non-collectible revenue and rents, results in a gross corporate income, available for fixed charges, non-operating expenses, dividends and surplus of $309,403 for 1927 and $350,663 for 1926.

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Would Sell California Property

The San Francisco-Sacramento Railroad has applied to the California Railroad Commission for authority to sell its railroad properties to the Sacramento Northern Railway, and the latter has applied for authority to purchase the same. The consideration named in the purchase agreement to be paid for the property is $1,675,100, the property to be delivered free from encumbrance. Lines involved include one between the city of Oakland and the city of Sacramento and a branch from West Pittsburg to Pittsburg, in Contra Costa County; the former comprises 84.8 and the latter 2.28 miles.

Asks to Abandon Branch Line in Oregon

The Oregon Electric Railway on July 31 requested permission from the Interstate Commerce Commission to abandon operation of a branch line extending from West Woodburn, Ore., a distance of 2.3 miles. According to the applicant in 1926 it substituted stage service upon an adjacent highway for railroad passenger service but the revenue from the stage line has been substantially less than cost of operation. The applicant states that the city of Woodburn and adjacent territory is adequately served by its main line and the main line of the Southern Pacific Company.

Fewer Directors in Cortland

A certificate was filed recently with the secretary of state at Albany, reducing the number of directors of the Cortland County Traction Company, Cortland, N. Y., from eleven to nine. The board of directors consists of C. H. Churchill, G. H. Garrison, Albert Haskell, Jr., Charles S. Ruffner, Paul D. Weakers, J. D. Whittemore, C. G. Wickwire, R. C. Brewer, and A. N. Woodhead.

Authorized Returns Not Earned in Kansas City

The operating statement of the Kansas City Public Service Company, Kansas City, Mo., for June shows receipts from railway fares were $680,629. This sum represents 9,158,986 cash fares, the average fare being 7.43 cents. The total number of passengers carried was 13,881,785 and the average fare per passenger 4.90 cents. Bus fares totaled $36,211. Bus passengers numbered 323,102, at an average fare of 11.21 cents. The actual cost of transporting each passenger was substantially in excess of this sum. Total receipts for the month from all sources were $751,651. Total June charges were $669,083, leaving the excess of receipts over charges $52,568. This is only 52.74 per cent of the sum the company was authorized to earn under the terms of the franchise. For the first six months of 1928 the company was authorized to earn $663,188 after operating expenses, taxes, and fixed charges, but actually earned $416,204, or 62.76 per cent of the authorized amount.

Strain on Seattle's Finances

At a recent conference at which Mayor Frank E. Edwards and members of the City Council were present, Roy E. Furse, acting superintendent of the Seattle Municipal Street Railway, issued a warning that severe financial strains loom for the railway during the next five years when bond redemption requirements reach their peak. He says steps for an adequate financial program cannot be safely delayed. The conference was held to discuss plans for rehabilitation of the system. Mr. Furse advocated a bond issue of $4,000,000 or $5,000,000 for local subscription, to finance the purchase of new cars, the reconstruction of existing tracks and other necessary improvements.

Traffic, Fare and Wage Figures

The number of revenue passengers, including bus passengers, reported by 215 companies to the American Electric Railway Association for June, 1928, compared with June, 1927, is as follows:

June, 1928	793,596,077
June, 1927	801,411,345
Decrease, per cent	0.98

The percentage decrease in June is slightly greater than that reported for May. One reason for this is that there were several rainy week-ends in the large cities in the eastern and middle western sections of the country which materially reduced the amount of traffic to the pleasure resorts, which are usually crowded on Saturdays and Sundays. Otherwise there does not seem to have been any fundamental change in the traffic situation throughout the country.

Average cash fare in cities of 25,000 population and over were

	Cents
July 1, 1928	8.1728
June 1, 1928	8.1457
July 1, 1927	7.9752

The rise in the average fare was due to an increase from 6 cents to 10 cents in Galveston, Texas, and an increase from 7 cents to 10 cents in Savannah, Ga. With these two changes added there are now 239 cities in the United States having a cash fare of 10 cents. Of these, 122 cities have a population of 25,000 or more.

The average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Average Hourly Rate Cents	Index Number 1913=100 Per Cent
July 1, 1928	57.48	210.94
June 1, 1928	57.44	210.79
July 1, 1927	57.20	209.91

Net Lower in Indianapolis

Gross earnings of the Indianapolis Street Railway, Indianapolis, Ind., for the six months ended June 30, 1928, showed a decrease of $92,349 from the corresponding period of 1927. Gross for 1928 was $2,794,017, compared with $2,701,667 a year ago. Net increased from $622,920 to $702,433, a gain of $79,512, but the six-month deficit was $19,602. With a June deficit of $55,851 the total deficit carried by the company to July 1, 1928, was $933,353.

Fewer Passengers in St. Louis

A 3,256,669 decrease in passengers during the first six months of 1928 compared with the similar period in 1927 is shown by the reports filed by the St. Louis Public Service Company with the city. In the quarter ended June 30 the company carried 60,763,736 cash passengers, using an average of 1,358 cars on week days, 1,172 on Saturdays and 618 on Sundays. In the similar period last year 62,761,114 passengers were hauled, 1,368 cars used on week days, 1,181 on Saturdays and 653 on Sundays. In the six months' period the total number of passengers was 122,876,154 against 126,132,823 in the first six months of 1927. The decrease was 1,259,291 in the first quarter and 1,997,378 in the second quarter.

Loss Described on Maine Road

At a recent hearing the Maine Public Utilities Commission listened to arguments in favor of the Androscoggin & Kennebec Railway abandoning service on its 14-mile line between Augusta and Winthrop, via Lake Cobbosseecontee and Lake Maranacook. Congressman John E. Nelson, acting for the railway, said that the line had been operating 26 years, that revenues for the first six months of 1927 were $515,486, and $451,209 for the 1928 period.

Referring to the popular idea that the Augusta division as a unit was profitable he said that making proper allowance for depreciation, this division in 1927 showed no profit over and above the $21,000 required for bond interest.

Approves Costs at Los Angeles

The Harbor Commission at Los Angeles, Cal., has approved the recommendation of Harbor Controller Edwards that $2,800,000 of harbor improvements bonds be sold to meet the costs of the proposed railroad classification yard and for one year's normal construction work at the port.

Signed certificates from the Santa Fe, Union Pacific, Pacific Electric and Southern Pacific railroads, all parties with the city in the agreement for unified operation of the Los Angeles Belt Line Railway at the harbor, have been turned over to the Harbor Commission. The certificates authorize execution of the agreement.

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Book Reviews

Lineman's Handbook

By Edwin Kurtz, M.S., E.E., professor of electrical engineering and head of department, Oklahoma Agricultural and Mechanical College, formerly member of educational department, Milwaukee Electric Railway & Light Company. Published by the McGraw-Hill Book Company, Inc., New York. 548 pages. Price $4.

Sections of particular interest to electric railway men in this handbook deal with pole line construction, power line erection and inspection, testing and maintenance. To give the reader a perspective of electric systems, chapters are introduced on elementary electrical principles and on the electric system. There are four chapters dealing with line material, equipment, protective equipment and line control equipment. Chapter VIII is a simple treatment of the factors governing line design. There is a comprehensive treatment of first-aid. The book concludes with a reprint of the accident prevention course for linemen.

The chapter on pole line erection includes sections on laying out the line, framing poles, erecting poles, setting poles, pole climbing, mounting crossarms, and concludes with some tables on the tensions in hard and medium-drawn bare copper wire for different span lengths. Several pages are given to the subject of power line erection. The chapter on inspection, testing and maintenance gives usual methods. It is well illustrated.

Die Selhsttatige Signalanlage der Berliner Hoch und Undergrundbahn.

By Alfred Bethe, chief engineer of the Berlin Elevated Railways, with a foreword by Dr. Kemmann. Published by Julius Springer, Berlin. 164 pages, 14 charts, illustrated. Price, 32 reichsmarks.

This is a very complete description of the automatic block signal system of the Berlin Elevated and Subway Lines. Former methods of block signaling are treated briefly, and the latest installations are considered in great detail. Complete wiring diagrams are given. The automatic train stop is also considered, and charts are included showing how it is adjusted to the schedule of the railway lines.

McGraw Electric Railway Directory—1928

Published by McGraw-Hill Catalog & Directory, Inc., New York. 256 pages. Price $10.

As a reliable guide to technical and operating conditions in the electric railway field this new edition of the McGraw Electric Railway Directory will be of invaluable service to operators and manufacturers. This up-to-the-minute survey covers geographic, managerial, equipment, track, shop and bus data on 741 operating companies and sixteen municipal railway properties. It also lists 122 holding companies, whose properties are located in the United States and its possessions, Canada, Newfoundland, Central America and the West Indies.

The names of 5,271 officials are given under the main office of their companies with a notation of the individual's local headquarters. As in former years, an index to electric railway companies is included with heavy black stars indicating holding companies. In addition, this year's directory contains an index to motor bus subsidiaries operated by electric railways. The contents also cover information on utility associations and national and state commissions.

The first issue of Electric Railway Directory appeared in 1884 with the first issue of the paper. It has been published continuously ever since.

Safety and Production

A report by the American Engineering Council. Published by Harper & Brothers, New York. 414 pages. Price $5.

In this volume, a representative committee of American executives has set forth its recommendations and findings about safety work today and its relation to high productivity. The book contains a complete picture, with results graphically shown, of safety and production conditions in seventeen major industries intensively studied. Sixty products groups in twenty basic industries were studied, and the experience of 14,000 American plants—with 2,500,000 workers and 54,000,000,000 man-hours of work—has been here recorded.

The American Electric Railway Association supplied the accident and production statistics from 1920 to 1926 for 172 electric railway systems involving 55,781 trainmen. These companies, in 1925, operated 860,576,318 car-miles and carried 5,926,032,087 passengers. In computing accidents rates, the association used the number of accidents per car-miles operated.

The passengers carried per car-mile and the car-miles operated per mile of track have been used as units of measurement for production rates. The rate based upon passengers carried per car-mile operated is an accurate measure of the density of traffic, which is also a factor affecting the number of accidents. The rate based upon the number of car-miles operated per mile of track is an adequate measure of the service rendered.

While apparently little change has taken place in the production rate of this group of electric railways, there has been a very uniform improvement in the rate of accidents to employees. From 1920 to 1925 there has been an over-all increase in the cost of accidents; but in more recent years the cost shows a downward trend.

Employees Stock Purchase Plan in the United States

Published by the National Industrial Conference Board, Inc., New York, N. Y., 245 pages. Price, $2.50.

This volume is the result of an investigation, conducted by Margaret L. Stecker, under the supervision of the Board's Staff Economic Council, of the movement in the United States toward increased holding by workers of the securities of the corporations by which they are employed. The investigation was based on data secured from 389 companies.

The first chapter describes various plans whereby employees may secure the individual and exclusive ownership of stock, bonds or other securities of their companies through cash purchase or on some form of partial payment basis. It also treats of the extent of employee stock ownership in the United States in 1927. Details of various stock purchase plans are next considered.

Other chapters discuss various problems which come up in connection with the operation of stock purchase plans and the benefits of employee stock sales to the company and to the employee. As a disadvantage, the risk of the investment is pointed out, as well as the means taken by some companies of eliminating this disadvantage. Three appendices describe the stock purchase plans of six large corporations, list companies which had or have had stock acquisition plans for their employees and recite the story of some stock subscriptions.

Code for Electricity Meters

Published by the National Electric Light Association, New York, N. Y. 122 pages.

This is the third edition of the code for electricity meters prepared by a sectional committee according to the procedure of the American Engineering Standards Committee under the joint sponsorship of the Association of Edison Illuminating Companies, the National Electric Light Association, and the United States Bureau of Standards. The code as published was approved as an American standard by the American Engineering Standards Committee on Feb. 20, 1928. It is known as A.E.S.C. standard No. 312—1928. The sectional committee which had charge of the revision included representatives from various national bodies interested in the standardization. The representative of the American Electric Railway Association was R. W. Eaton, public service engineer, Providence, R. I.

The code includes definitions, standards, metering, specifications for acceptance of types of electricity meters, specifications for acceptance of types of auxiliary apparatus for use with meters, installation methods, watt-hour meter test methods, laboratory and service tests, and demand meters. This edition is a completely revised and rearranged compilation of the second edition, issued in 1912, and the sectional demand meters issued in 1920.

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Personal Items

A. J. Fink Given New Title in St. Louis

A. J. Fink was appointed director of transportation of the St. Louis Public Service Company, St. Louis, Mo., effective on Aug. 1. He will have full charge of all transportation matters as well as all schedule and traffic matters now in his charge. Mr. Fink went to St. Louis in March of this year, assuming the position of transportation engineer. He went there from Pittsburgh, where he learned the business of transportation under Thomas Fitzgerald.

Changes on Illinois Valley Division

E. W. Fowler has been named vice-president and general manager of the Chicago & Illinois Valley Railroad.

F. E. Fisher is retiring from the management of this property, but will continue with the organization as industrial representative.

Subject to the appoval of the Interstate Commerce Commission and of the Illinois Commerce Commission, the property of the Illinois Valley Division of the Illinois Traction, Inc., will be transferred to the Chicago & Illinois Valley Railroad. These changes were announced by L. E. Fischer, vice-president.

Honor for Key System Officer

B. W. Fernald, manager of the claim department of the Key System Transit Company, Oakland, Cal., was elected president of the Pacific Claim Agents' Association at the recent convention in Coronado. At one time Mr. Fernald was auditor of the Tonopah & Tidewater Railroad and later auditor of the Oakland Traction Company, San Francisco, Oakland & San Jose Railway, East Shore & Suburban Railway and California Railway.

New Officers Elected in Cortland

G. H. Garrison, vice-president and general manager of the Cortland County Traction Company, Cortland, N. Y., was elected president of the company on Aug. 4. Mr. Garrison's election fills the vacancy created by the death July 4 of President Edwin Duffy.

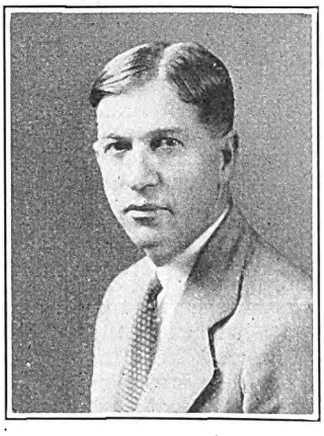
C. H. Churchill was elected vice-president and general manager; J. D. Whittemore, vice-president; Albert Haskell, Jr., secretary, and P. D. Weathers, treasurer.

Mr. Churchill has been general manager of the Port Henry Light, Heat & Power Company, Port Henry, subsidiary of the New York Power & Light Corporation. Mr. Whittemore is executive engineer of the New York Power & Light Corporation, with offices in Albany. Mr. Weathers is treasurer of the Mohawk-Hudson Power Corporation and of the New York Power & Light Corporation.

A. E. Morris Traffic Manager at Dallas

With the reputation of a big business builder A. E. Morris went to Dallas recently in the rôle of traffic manager of the Texas Electric Railway. His former position was general passenger and freight agent of the Oklahoma Railway. It was there that he arranged the details of through rates and divisions, and succeeded in increasing business from 20 to 30 per cent a year from 1923 to 1928.

Mr. Morris has climbed rapidly. In 1905 he was local agent for the Nash-



A. E. Morris

ville, Chattanooga & St. Louis Railway at Buena Vista, Tenn. Five years later he was made local agent for the Louisville & Nashville Railway and from 1912 to 1917 he served with the Rock Island line in various capacities ranging from claim clerk to chief clerk. For the next eleven years, with the exception of two years in which he was engaged in Army service, Mr. Morris was general passenger and freight agent of the Oklahoma Railway.

He was born in 1890 in Tennessee. He has served as president of the traffic club of Oklahoma City and is a member of the Dallas Traffic Club and the American Legion. The new traffic manager predicts rapid progress for the freight business started by the Texas Electric Railway in June, a pioneer project for strictly electric companies. The company operates 231 miles of electric railway and connects with twelve other railroads passing through the heart of Texas. The service reaches many of the principal cities of the state, including nine important shopping and manufacturing centers.

Alexander Mackenzie Retires

Sir Alexander Mackenzie, Toronto, well-known in South American public utilities, has resigned as president of the Brazilian Traction, Light & Power Company, Ltd., but will remain as a director and will continue to serve in a consulting capacity. The retirement of Mr. Mackenzie, due to ill health, terminates a period of service with this company of nearly 30 years. He became president of the Brazilian company in 1915 to fill the vacancy created by the death of Dr. F. S. Pearson. At that time also he was elected president of the Rio de Janeiro Tramway, Light & Power Company, Ltd., the São Paulo Tramway, Light & Power Company and the São Paulo Electric Company, Ltd.

Changes in Akron

R. L. Stevenson, claim agent of the Northern Ohio Power & Light Company, Akron, Ohio, since October, 1924, left on June 15 to occupy a similar position with the West Penn Railways, with headquarters in Pittsburgh.

C. L. Hansen has been transferred from the auditing department of the Akron company to the claim department.

Promotions in St. Louis

Dennis Kelley, formerly assistant auditor, stores account, for the St. Louis Public Service Company, St. Louis, Mo., has been promoted to the newly created post of general storekeeper.

Herbert Mueller, who has been cost keeper for the way department, has been advanced to the post vacated by Mr. Kelley.

J. T. Hamilton With Lackawanna Consultants

James T. Hamilton, master mechanic of the New York, Westchester & Boston Railway, on Aug. 1 became consultant for Jackson & Moreland, Boston, Mass., on the electrification of the Delaware, Lackawanna & Western Railroad out of New York City. Mr. Hamilton was born in Howard, R. I., and was educated at the Cranston High School and the Bliss Electrical School of Washington, D. C. During his summer vacations while attending college he was on construction work for the Standard Electrical Company of Providence. In September, 1913, he entered the electrical department of the New York, New Haven & Hartford Railroad at the Van Nest shop, Van Nest, N. Y. He was later appointed electrical inspector and on May 1, 1917, became chief inspector. In this capacity he was assistant to the shop superintendent and through organization changes he became mechanical superintendent. Before taking up work with the New York, New Haven & Hartford Railroad, by which the New York, Westchester & Boston Railway is controlled, Mr. Hamilton had been

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engaged on electrification work with the Westinghouse Electric & Manufacturing Company. For seven years he has been superintendent of equipment for the Westchester Street Railroad and the New York & Stamford Railway. He is a member of the heavy traction committee of the American Electric Railway Association and is a member of the American Institute of Electrical Engineers. Mr. Hamilton will eventually be located at Hoboken, N. J., but for the present he expects to be situated in Boston.

G. O. Muhlfeld Heads New Firm

Stone & Webster official to direct new $9,500,000 corporation which succeeds to gigantic engineering business

GEORGE O. MUHLFELD, vice-president of Stone & Webster, Inc., has been elected president of the new Stone & Webster Engineering Corporation, capitalized at $9,500,000. This corporation has taken over from Stone & Webster, Inc., its construction and engineering business and its interest in Ulen & Company, and has also acquired from the North American Company its engineering and construction company, McClellan & Junkersfeld, Inc. Besides being president of Stone & Webster Engineering Corporation and vice-president of Stone & Webster, Inc., Mr. Muhlfeld is a director of American Investors Corporation, Engineers Public Service Company, General Public Service Corporation, Grace National Bank, Pennsylvania Power & Light Company, Simms Petroleum Company, Inc., Stone & Webster Associates Corporation, Stone & Webster and Blodget, Inc., and Ulen & Company.

Mr. Muhlfeld has been associated with Stone & Webster since 1903. For the past 21 years he has been one of the principal executives of the construction and engineering branch of the business, and since 1919 the chief executive of this branch, which has done work totaling nearly $900,000,000. Born in Peru, Ind., he attended Purdue and Cornell Universities, then worked on various construction jobs in Chicago, Detroit and Seattle. At Seattle he joined the Stone & Webster organization and was associated with S. Z. Mitchell, since become a national figure in utility circles, on the Puyallup River Development, one of the earlier hydro-electric stations built by Stone & Webster.

After completing this project and others, including the Taylors Falls, Minn., development he came to the firm's Boston office in 1907. In 1912 he was placed in charge of all construction work. The scope of his activities continued to broaden and when Stone & Webster became identified with the government shipbuilding program in 1917, the construction of the Hog Island shipyards was under his personal direction as senior vice-president of the American International Shipbuilding Corporation.

Mr. Muhlfeld then changed his headquarters to the New York office of Stone & Webster. There, in addition to other work, he has had complete charge of all construction and engineering done by the organization. Included in this may be mentioned power stations for the Boston Edison Company, Southern California Edison Company, Potomac Electric Power Company, Montaup Electric Company and Luzerne County Gas & Electric Company, the gigantic headquarters for the Insurance Company of North America in Philadelphia, power stations and manufacturing plants for the Ford Motor Company in this country and abroad, and the recently-completed Conowingo hydro-electric development for the Philadelphia Electric Company. Interspersed with this work has been the supervision by him of appraisals and reports of properties valued at more than $6,000,000,000.

Ulen & Company have done a large amount of foreign work, including more recently new water-works and sanitary systems in a number of cities in Poland; water supply, electric railways, sewer systems, municipal buildings, docks and harbor improvements in the Republic of Colombia; and a reconstruction of the water-works systems of Athens and Piraeus; besides work in Brazil. Contract has recently been awarded by the Persian government to a syndicate composed of Ulen & Company and a German Consortium for the construction of a railroad across Persia, connecting the Caspian Sea with the Persian Gulf. Associated with Ulen & Company in building the southern half of the railroad are two prominent British and French firms and another American firm.

Recent work done by McClellan & Junkersfeld includes the Cahokia steam station for the Union Electric Light & Power Company, St. Louis; the San Francisco steam station for the Great Western Power Company, and the power house for the University of Pennsylvania at Philadelphia.

M. W. CHAMBERLAIN, general manager of Leeds City Tramways, Leeds, England, was appointed general manager of the Belfast City Tramways, Belfast, Ireland, on June 27. Mr. Chamberlain has been manager at Leeds for three years, and prior to that he was in Oldham. One of his first problems at Belfast will be to combat bus competition.

MILLER LASH, K.C. succeeds Sir Alexander Mackenzie as president of the Brazilian Traction, Light & Power Company, Ltd.

Obituary

WAYLAND LLOYD ARNOLD, widely known in the electric railway and public utility field, died on July 28 in Chicago.

W. L. Arnold's active life had been devoted mostly to his duties in the electric railway and other public utility fields. In 1890 he joined the Thomson-Houston Electric Company, which later was consolidated with the Edison General Electric Company to form the present General Electric Company. After being in charge of the St. Louis office of the General Electric Company he joined the Arnold Engineering Company, engineers and constructors, remaining there as vice-president until 1926. In the meantime he had also become vice-president of the Elgin & Belvidere Electric Railway, holding both offices until his retirement from active business in 1926.

Mr. Arnold was born in Jackson, Mich., on July 6, 1863. When he was one year old his parents made the journey by covered wagon from Chicago to the territory of Nebraska, settling at Ashland. There in the new west he grew up with the pioneers, his father being a member of the Territorial Legislature when Nebraska was admitted to the Union. One of his brothers is Bion J. Arnold, eminent engineer and consultant. "W. L." as he was familiarly known among his friends, was widely traveled, having visited many of the progressive countries of the world.

HENRY J. SULLIVAN, superintendent of tracks and lines of the Springfield Street Railway, Springfield, Mass., died in Springfield July 30. He became connected with the Springfield Street Railway fifteen years ago. In his earlier years he was employed by the Boston & Albany Railroad, but left that company to engage in construction work.

JOHAN M. ANDERSON, president of the Albert & J. M. Anderson Manufacturing Company, Boston, Mass., died at his home in Brookline on July 25. Mr. Anderson was born in Norway 73 years ago and came to this country 48 years ago to join his brother Albert. He was a pioneer in the manufacture of overhead line material and molded insulation, designing many of the present-day standards. Many notable achievements in the design and construction of switches and circuit breakers are attributed to him. He was well known among power plant engineers.

JOHN S. HARSHMAN, a prominent figure in the electric railway industry in Central Ohio for many years, died recently in Sprinfield. Mr. Harshman was one of the promoters of the Dayton, Springfield & Urbana Electric Railway, which later became part of the Indiana, Columbus & Eastern system. He was also an officer of the Columbus, Delaware & Marion Railway, the predecessor of the Columbus, Delaware & Marion Electric Company.

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Market for Track Materials Active

Recent purchases of equipment and supplies cover wide range of products

ALTHOUGH this is not the season for large purchases of track material, reports from a number of railways, indicate that the market for track materials has been active during the past 30 days. Among the recent purchases are 60,000 cedar ties, 20,000 yellow pine ties, 4,500 tons of rails, 122,000 tie plates, 9,000 tie rods and 800 kegs of track spikes by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. The Portland Electric Power Company, Portland, Ore., has ordered $10,000 worth of rails and $10,000 worth of ties.

The Louisville Railway, Louisville, Ky., has placed an order for 25,000 ties to be used in replacement and will purchase ties, bolts, tie plates, joint plates, spikes, and bonds for the 500 tons of rail ordered in February. The Dallas Railway & Terminal Company, Dallas, Tex., has ordered 200 kegs of track spikes and contemplates the order of about one car of special work for electric over steam railway crossings. The Municipal Railway, San Francisco, Cal., has ordered eight pieces of special track work, 50 kegs of bolts and 75 kegs of spikes. The Ottawa Electric Railway, Ottawa, Canada, has ordered 250 tons of groove rail, 30 tons of tee rail and welding plates for same. Toronto Transportation Commission has ordered one Lincoln Stable Arc welder 400-600 volts d.c., 400 amp., portable truck type, and one Gurney track scale of 100 tons capacity. Another company has ordered one tongue switch, mate and half slot frog for special trackwork costing $1,369; 1,000 steel tie plates costing about $200 and one Cleveland Portable Pneumatic Grinder with 8 x 1-in. grinding wheel and wheel guard.

Georgia Power Company, Atlanta, Ga,. is negotiating with the country commissioners for the paving between the tracks from Atlanta city limits to Buckhead. Gary Railways, Gary, Ind., has started an extension of the second track on its West Eleventh Avenue line in Gary from Rutledge Street to Wilson Street, a distance of six blocks. Mount Tom Railway, Holyoke, Mass., has installed a new steel cable, 5,000 ft. long on the road running from Mountain Park to Mount Tom Summit. The company is a subsidiary of the Holyoke Street Railway.

Overhead Line Materials

Overhead line materials amounting to $30,000 were ordered by the Portland Electric Power Company and the Dallas Railway & Terminal Company placed an order for one minimum car of Creosote pine poles. The Milwaukee Electric Railway has ordered six cars of cedar poles, four cars of pine poles, two cars of weatherproof wire, one car of transformers, one-half car of signal devices and two cars of cross arms. The Toronto Transportation Commission has ordered 15,925 ft. of paper insulated, lead covered cable.

Rolling Stock

Seventeen Peter Witt type passenger cars have been ordered by the Dallas Railway & Terminal Company from the St. Louis Car Company. Ten new city cars have been ordered by the Milwaukee Electric Railway & Light Company. This company is also remodeling 40 vehicles into one-man safety cars, remodeling eight cars for suburban rapid transit service and reconstructing 34 old cars into 17 three-truck trains. It has also ordered seven new buses and is rebuilding fifteen double-deck buses into one-man operated buses. Seattle Municipal Railway, Seattle, Wash., has ordered two 21-passenger street car type Studebaker buses. Two de luxe intercity buses have been ordered from the White Company and the Bender Body Company by the Louisville Railway. The Dallas Railway & Terminal Company has ordered 150 rolled steel wheels and the Toronto Transportation Commission ordered 100 wheels.

A new 35-bus garage and equipment for same is contemplated by the Municipal Railway of San Francisco. The Portland Electric Power Company has let a contract for power and substation work amounting to $25,000 and the Milwaukee Electric Railway & Light Company has let contracts for a $1,200,000 addition to its Lakeside Power plant. The United Railways & Electric Company, Baltimore, Md., plans a substation to cost approximately $150,000.

Track Extension in Memphis

Memphis Street Railway, Memphis, Tenn., has notified Mayor Overton that as soon as the city passes an ordinance permitting the extension the railway will begin construction of car tracks on Jackson Avenue from the present end at Watkins to the L. & N. crossing.

The line, approximately 1¼ miles long, will cost more than $70,000.

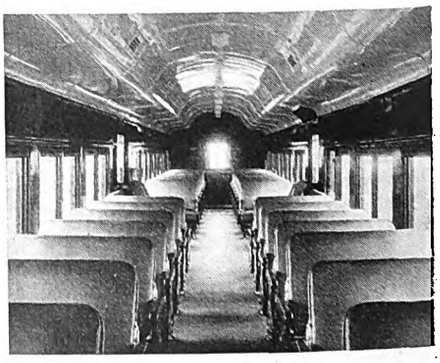
Improvements in Ontario

Hydro Electric Railways, Toronto, Canada, has underway a large program of track construction and rehabilitation in Windsor and surrounding municipalities. The work in Windsor includes 1,000 ft. of track and a Y being rehabilitated. This track is in pavement, and International twin steel ties and 100-lb. T-rail, A.R.A. type A section, are being used. A contract has been given Cadwell Sand and Gravel Company for the sub-grade, and work has

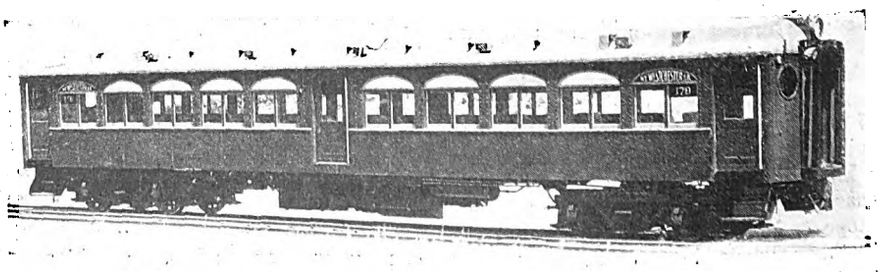
New York, Westchester & Boston Railway Cars Being Delivered

Delivery of twenty cars is being made to the New York, Westchester & Boston Railroad, New York, N. Y., by the Osgood Bradley Car Company, Worcester, Mass. These cars, which were described in the April 21 issue of the JOURNAL, are designed for heavy suburban service and are 72 ft. 7¼ in. long and 9 ft. 10¾ in. wide. The car bodies weigh about 63,200 lb., each car weighing approximately 124,830 lb. complete. They are of the all-steel type, made up of unit side frame, Stillwell design.

The trucks have an 8-ft. wheelbase, the motor trucks being equipped with 36-in. wheels and two inside-hung motors. The trailer trucks are equipped with 42-in. wheels. The 11,000-volt single-phase power feeds through one of two pantographs through high tension leads to the transformer. The voltage is then stepped down for use on motors and auxiliary circuits.



The interior of these new cars is finished in green with white enamel ceiling



Type of heavy suburban cars being delivered to the New York, Westchester & Boston Railroad

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started. The cost of the work will be approximately $31,000. On London St., between Windsor city limits and Huron Line in Sandwich, 3,000 ft. of double track will be rehabilitated. This track is in concrete. Steel ties and T-rail, A.R.A. type A section, will be used, and joints will be welded by the Thermit process. Work will start in the near future. The cost of the rehabilitation will be about $80,000. On Field Ave., in Windsor and Sandwich, and on Lena St. in Sandwich new track is to be laid. On Field Avenue in Windsor 2,500 ft. of double track will be laid in pavement, and on Field Avenue and Lena St. in Sandwich 3,000 ft. of single track, open construction, will be laid. On the double track steel ties and 100-lb. T-rail, A.R.A. type A section, with Thermit welded joints, will be used; on the single track, 100-lb. rail, cedar ties with tie plates, and stone ballast, will be used. The job will cost approximately $130,000. On Tecumseh Road, Ford City, easterly to Ford City limits, 3,000 ft. of single track, open construction, will be laid. C.P.R. section 85-lb. rails, tie plated cedar ties, and stone ballast will be used. The work will cost about $31,000. All of the foregoing work is to be completed during the present construction season.

Eighteen New Cars for Phoenix

Phoenix Municipal Railway, Phoenix, Ariz., will purchase eighteen double-end, double-truck cars according to plans adopted by the City Commission. Bids on the cars will be opened on Aug. 22. New cars were called for in the rehabilitation ordinance for which the $750,000 bond issue was approved by the voters on April 30, 1927. The legality of the bond issue was upheld by the State Supreme Court on Jan. 16.

Philadelphia Loop Construction to Start in Fall

With $4,000,000 available, Philadelphia, Pa., is preparing to proceed with the construction of the Ridge Avenue subway loop, an authorized project in step No. 1 of the high-speed program.

Director Myers, of the Department of City Transit, has ordered the plans expedited so that actual construction will get under way by fall.

The subway extension will proceed east from Broad Street and Ridge Avenue and south on Eighth Street. The city is proceeding with condemnation of the land involved in the cutting through of Ridge Avenue from Ninth and Vine Streets to Eighth and Race Streets.

Information on Shipping to A.E.R.A. Convention

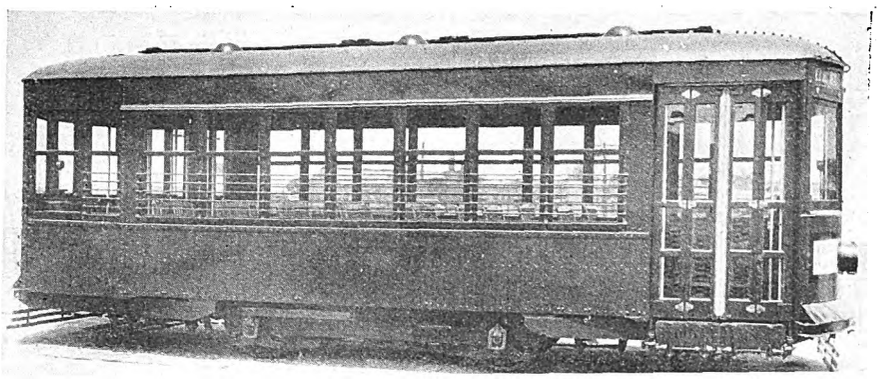
Shipping information which has been mailed to all exhibitors at the coming A.E.R.A. Convention in Cleveland, by Frederick Dell, director of exhibits includes instructions in shipping both by freight and express. All freight and express shipments should be prepaid. All carload shipments made over any railroad should be consigned as follows: Your firm name, care of Norris Bros. Company, Pennsylvania Railroad, City Hall Siding, Cleveland, Ohio, space number, for American Electric Railway Association Convention. Less than carload shipments, or L.C.L. freight should be shipped over any railroad addressed as follows: Your firm name, care of Norris Bros. Company, 2138-44 Davenport Avenue, Cleveland, Ohio, space number, for American Electric Railway Association Convention. Original bills of lading should be mailed direct to Norris Bros. Company, 2138-44 Davenport Avenue, Cleveland, Ohio.

Exhibitors in the Central Electric Railway territory may ship over any of the lines in that territory. The three interurban lines going into the City of Cleveland are as follows: Cleveland

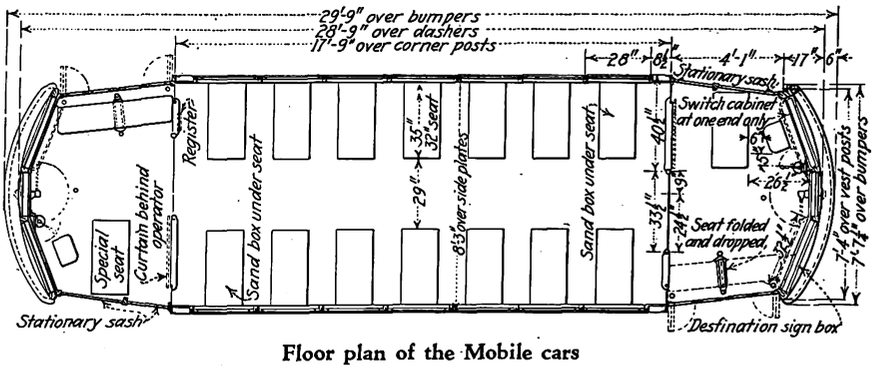
Single-Truck Cars for Mobile

Six one-man, motor, city type passenger cars are being built for the Mobile Light & Railroad Company, Mobile, Ala., by the American Car Company, St. Louis, Mo. The cars are of the double-end, single-truck type with fourteen seats. Each car is 29 ft. 9 in. long, 8 ft. 3 in. wide and 10 ft. 8 11/16 in. high from rail to trolley base.

The bodies are semi-steel construction with arch roofs and folding end doors. The finish is in yellow enamel with Mexican mahogany interior trim. Each truck is equipped with two outside-hung motors and 26-in. wheels. The truck wheelbase is 8 ft. 6 in. Plain journal and armature bearings are used. Additional details are given below.



One of the single-truck, one-man cars being built for the Moblie Light & Railroad Company, Mobile, Ala.



Floor plan of the Mobile cars

Length over all	29 ft. 9 in.
Length over body posts	17 ft. 9 in.
Truck wheelbase	8 ft. 6 in.
Width over all	8 ft. 3 in.
Height, rail to trolley base	10 ft. 8 11/16 in.
Window post spacing	28 in.
Body	Semi-steel
Roof	Arch
Doors	Folding-end
Air brakes	G. E. straight
Armature bearings	Plain
Axles	A. E. R. A.
Car signal system	Faraday buzzer type
Compressors	D. H. 16
Conduit	Flexible duraduct
Control	K-63 B R
Couplers	Pull bar
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Hunter roller type
Door mechanism	National Pneumatic Company
Fare boxes	Johnson D M 4
Finish	Enamel
Gears and pinions	Spur tooth
Glass	Plate
Hand brakes	American Car Company's drop handle
Headlights	Ohio Brass Company's Imperial W-D-F
Interior trim	Mexican mahogany
Journal bearings	Plain
Journal boxes	Brill
Lamp fixtures	G.E.
Motors, 2	Westinghouse No. 510-E, outside hung
Painting scheme	Yellow
Registers	International R 5
Roof material	Canvas
Sash fixtures	O. M. Edwards Company
Seats	Waylo reversible
Seat spacing	28 in.
Seating material	Wood slats
Slack adjusters	Brill
Steps	Folding
Step treads	Feralun
Trolley catchers	Earll with No. 79 socket
Trolley base	U. S.—20-A
Trolley wheels	U. S. No. 31
Trucks	Brill 79-E-2
Ventilators	Brill exhaust
Wheels, type A.E.R.A.	Diameter 26 in.
Wheelguards or fenders	American Car Company

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Exhibitograph No. 16

Carrying out the plans

and South Western Railroad-Boliver Road Station, Northern Ohio Power & Light Company-Boliver Road Station, and the Lake Shore Electric Railway-Boliver Road Station.

All street cars intended for track display and shipped to Cleveland on their own wheels or on flat cars should be shipped and billed as follows: Your firm name, care of Cleveland Railway Company, Harvard Avenue Yards, Newburgh and South Shore Railroad Delivery, Cleveland, Ohio, space number, for American Electric Railway Association Convention. All such cars will be handled by the Cleveland Railway Company, moved to the city over their tracks and placed in exhibition space at actual cost of unloading, reloading, transporting, and placing. No charge will be made for storage.

All electric locomotives, gasoline rail cars, dump and crane cars, shipped to Cleveland on their own wheels should be shipped and billed as follows: Your firm name, care of Norris Bros. Company, Pennsylvania Railroad, City Hall spur track, Cleveland Public Auditorium, Cleveland, Ohio, space number, for American Electric Railway Association Convention. Norris Bros. Company will handle such rolling equipment. Buses arriving in Cleveland under their own power can be delivered by owners' drivers direct to exhibition space and placed. A charge for unloading buses will be made when necessary.

Exhibitors making shipment by express and desiring an express company to make delivery direct to the auditorium should consign their exhibits as follows: Your firm name, for American Electric Railway Association Convention, space number, Cleveland Public Auditorium, Cleveland, Ohio, express prepaid. Many other important instructions are included in the shipping information, and copies may be had by addressing the director of exhibits of the American Electric Railway Association, 292 Madison Avenue, New York, N. Y.

Timken Axle Earnings Show Gain

Operations of the Timken-Detroit Axle Company for the six months of 1928 show earnings of $716,410 after all charges, including estimated federal tax, as compared with earnings of $660,011 for the first six months of 1927.

The company's financial condition has continued to improve. Cash and certificates of deposit amount to $3,843,568, showing an increase of $219,461 since the first of the year, with no debts other than for current liabilities. Net working capital is $8,907,002, an increase of $1,019,919 during the six months. The surplus account now stands at $3,584,754 and the book value of the common stock is $14 per share. Common and preferred dividends have been paid amounting to $455,209, and $99,057 has been paid for the purchase of preferred stock for sinking fund purposes.

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

Metals—New York	Aug. 7 1928
Copper electrolytic, cents per lb.	14.525
Copper wire, cents per lb.	16.625
Lead, cents per lb.	6.20
Zinc, cents per lb.	6.60
Tin, Straits, cents per lb.	47.875
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.15
Somerset mine run, f.o.b. mines, net tons	1.825
Pittsburgh mine run, Pittsburgh, net tons	1.75
Franklin, Ill., screenings, Chicago, net tons	1.50
Central, Ill., screenings, Chicago, net tons	1.475
Kansas screenings, Kansas City, net tons	2.175
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.3
Weatherproof wire base, N.Y., cents per lb.	17.125
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.1
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal	$0.58

TRADE NOTES

REYNOLDS ELECTRIC COMPANY, Chicago, Ill., has taken over the Korrectolite Company and E. F. Oliver, formerly general manager of the Korrectolite Company, is now with the Reynolds Electric Company.

SULLIVAN MACHINERY COMPANY, Chicago, Ill., has appointed as its distributors in New York, N. Y., the United Hoisting Company; in Salt Lake City, Utah, the Utah Eastern Iron & Metal Company, and in Sacramento, Cal., the Standard Equipment & Supply Company.

GUNITE CORPORATION, Rockford, Ill., has announced the recent appointment of C. W. Rhoades to the sales division of that company. In his new capacity Mr. Rhoades will act as sales engineer in direct contact with the bus field in furthering the use of Gunite brake drums. Mr. Rhoades' experience in the organizations of the Fageol Motors Company of Kent, Ohio, and the Cincinnati Car Company, together with his previous long experience in the railway field, gives him an unusually good background for serving in his new capacity.

WAGNER ELECTRIC CORPORATION, St. Louis, Mo., announces that Fred Johnson, heretofore in charge of its St. Louis sales office, is now manager of the Los Angeles branch office. This transfer brings to a close 21 years of service as district manager of the St. Louis territory. Alexander L. Miltenberger, heretofore Pacific Coast manager with headquarters in San Francisco, has been transferred to St. Louis as branch manager of the St. Louis office.

L. B. FOSTER COMPANY, Pittsburgh, Pa., has opened a St. Louis office, located at 1725 Railway Exchange Building, where it will render service to buyers and users of industrial trackage.

ADVERTISING LITERATURE

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, East Pittsburgh, Pa., has just released a new publication (Reprint 334) under the subject "Oil-Electric Motive Power on the Canadian National."

LINCOLN ELECTRIC COMPANY, Cleveland, Ohio, has issued a bulletin describing the new electronic tornado method of welding entitled, "Automatic Arc Welding by the Electronic Tornado Process." The text deals first with the strength, ductility and metal structure of the welds made by the new process. It continues with a description of the operation and a table showing the speed and costs of automatic arc welding of metal of different thicknesses for various joints.

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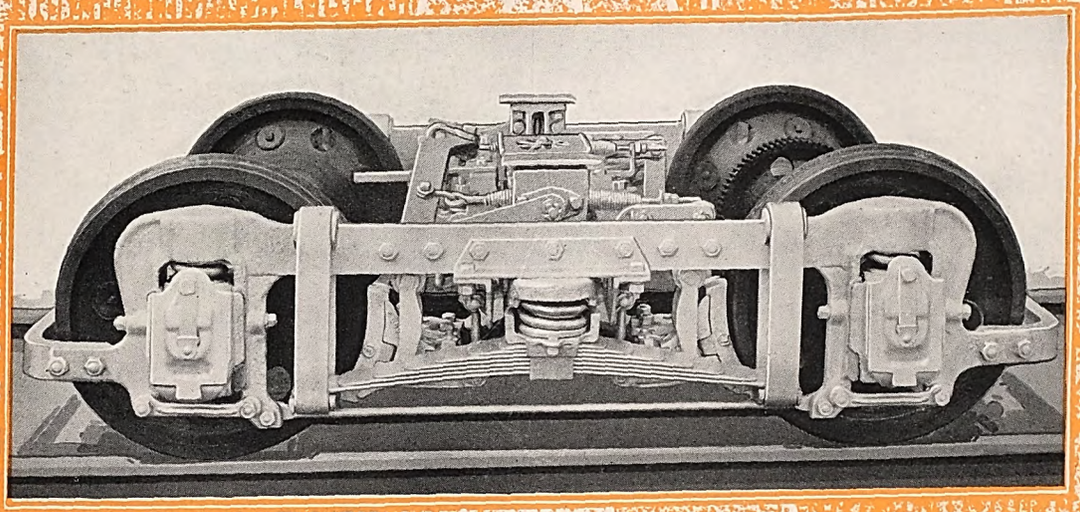

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Brill 177-E Trucks are well known for their comparatively light weight and comfortable riding action. They will out-last the life of a car if given ordinary attention and continue to remain "in square."

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Brill 17-E Truck for Light Weight Cars

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MAINTENANCE AND CONSTRUCTION ISSUE

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. AUGUST 18, 1928 Twenty Cents Per Copy

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Time saving, operating economy and Timken Bearings are inseparable.

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A Record *through* RELIABLE RENEWALS *and* SYSTEMATIC OVERHAUL

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2. A reduction in maintenance and operating costs—1.89c. per car mile.

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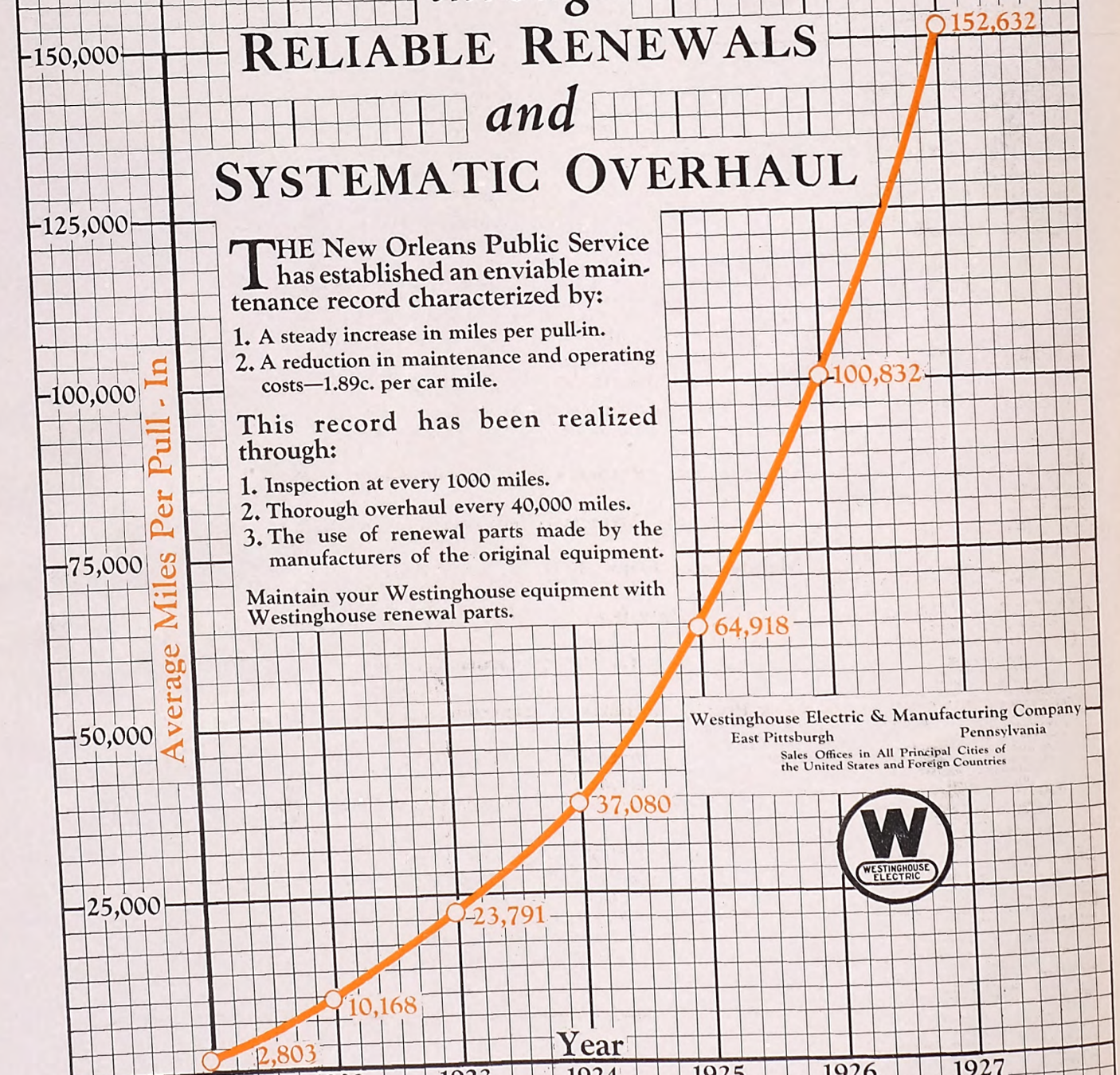
1. Inspection at every 1000 miles.
2. Thorough overhaul every 40,000 miles.
3. The use of renewal parts made by the manufacturers of the original equipment.

Maintain your Westinghouse equipment with Westinghouse renewal parts.



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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of Street Railway Journal and Electric Railway Review
CHARLES GORDON, *Editor*

LOUIS F. STOLL,
General Manager

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Mr. Hoover Expresses His Views on Business

FOR the first time in American history since Washington, an engineer is a candidate for the highest office in the land. The engineering profession and American business men have therefore had reason to expect in this Presidential campaign an unusually practical and comprehensive interpretation of the relation between economic and social problems. Though business men have for several years known something of the views of Herbert Hoover on the relation between government and business, and have experienced the results of the application of those views in the functioning of the Department of Commerce under his guidance, there is, nevertheless, a new significance in their expression to the nation as the policy of a candidate for the Presidency at the opening of a great political campaign.

In his speech on Aug. 11, accepting the nomination as the Republican candidate, Mr. Hoover lost no time in justifying the confidence of those who looked to him for a straightforward expression of sound governmental policy regarding business. In a few short paragraphs he lays down a business creed, not alone for the nation and the government, but for business itself. He recognizes first that increasing complexity of our economic life tends to multiply the relations between government and business. It is the government's function to maintain equality of opportunity and to protect public rights. Beyond that it should not go. It should not extinguish enterprise and initiative by going into competition with its own citizens. "The production and distribution of goods on a large scale is not wrong," said Mr. Hoover. "The test of business is not its size—the test is whether there is honest competition, whether there is freedom from domination, whether there is integrity and usefulness of purpose."

Upon business itself Mr. Hoover places the responsibility for regulating its own conduct so as to make unnecessary government regulation or competition. Business is founded upon public faith and a high sense of moral responsibility within business itself, he maintained. In the fact that self-regulation of business has grown rapidly he found great promise for the future. He refrained from elaborating on the part which the Department of Commerce, under his guidance, has played in helping business and government to work co-operatively in bringing about higher standards of business practice. But business men themselves know from their experience with the Department of Commerce, Mr. Hoover's capacity to put into practice the ideals and principles which he expressed in his speech.

American business, non-partisan in the past, should be most reluctant to abandon this policy, the wisdom of which has been proved by experience. The powers of the nation's chief executive are so circumscribed that business has little to expect from the election of any particular candidate. In Mr. Hoover and Mr. Smith, the country is fortunate in having a choice between two strong and able men. But under our system of government we elect a president through a great national political campaign in which views on questions affecting the country's economic welfare are given the widest possible circulation. Unfortunately, sound principles are sometimes submerged in the heat of partisanship. When, therefore, for the first time, we find an engineer engaged in a campaign for the presidency it is not surprising that something of the unusual has entered the proceedings. It was to be expected that the passion for accuracy and straight thinking which are cultivated in the mind of the engineer from early training, when seasoned by world wide experience in many lands and under many economic and social systems, would reflect itself under the glaring spotlight to which a presidential aspirant is subjected. This evidence we find at the very beginning of Mr. Hoover's campaign in the blunt statement, "We shall use words to convey our meaning, not to hide it." Surely, American business will indorse this unique procedure in a political campaign. It is to be hoped that Mr. Smith will follow the same policy, and that his views on economics and business will be equally sound and as frankly expressed.

Much for the Maintenance Man at the Convention

PERHAPS no other group will find so much of interest and value in the exhibits and proceedings at the forthcoming Cleveland convention as those men who have to do with maintenance of cars, buses, track and overhead. This is the group to whom the problem of keeping the wheels turning is not a matter of casual interest but of constant concern. The men responsible for maintenance activity are everlastingly on the firing line, and are quick to respond to any suggestions for improving their practices or methods. Ideas which a shop foreman, a roadmaster or a master mechanic might pick up from the exhibit itself, or from contact with others engaged in the same line of work, often can be translated into tangible results with little delay and with little or no expense.

It is particularly desirable that the minor executive attend. None is quicker to grasp the value of a new shop kink or mechanical device than the man directly in charge of any one of the numerous jobs that are included in the daily routine of the average maintenance force. After all has been said and done, it is often the foreman or minor executive who carries the real burden of keeping things going, and in no phase of operation is this more true than in the maintenance department.

At Cleveland there will be displayed not only the regular line of tools and machinery that have featured

This is the issue in August that is devoted essentially to maintenance and construction subjects

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the exhibits in years past, but a number of appliances more recently developed and not previously shown. The car and truck exhibit is to be particularly interesting, illustrating the latest advances in improving the street car to meet the present-day standard of transportation. The bus display, as heretofore, will include the latest refinements in body and chassis design. Manufacturers of garage and shop equipment have promised a noteworthy display of their products.

The property of the Cleveland Railway in itself constitutes an exhibit of no mean order. Here are to be seen modern shops, cars of the latest design, excellent track and roadway, and an up-to-the-minute operating organization. The city is the center of an extensive network of interurban lines and bus routes. Also in Cleveland and its immediate environs are the plants of a number of the leading manufacturers of electric railway materials and of buses and bus bodies.

As to the proceedings at the convention meetings, it is enough to say that a diversified program of interest to maintenance men has been arranged under the auspices of the Engineering Association of the A.E.R.A., with discussions led and participated in by prominent figures in the industry. A foreign observer has said that one of the most potent sources of American supremacy in industrial achievement is the free exchange of ideas among industrial leaders. Of great value to those operating and maintenance men fortunate enough to attend the Cleveland convention will be the opportunity afforded to meet and exchange ideas with men engaged in similar work from all parts of the land. The meeting is not sectional; it is national in scope. The operator from the Pacific Coast is given an opportunity to make contact with men busy with similar activities and confronted with the same problems from the Gulf states and the Atlantic seaboard. In the hotel lobbies, among the exhibits, at the regular sessions and at committee meetings acquaintances are made and ideas assimilated of lasting value to the individual and to the company he represents. A single improvement suggested by a casual conversation or the discussion in one of the regular sessions may lead to a saving worth many times the cost of the trip. In no industry is there a freer exchange of thoughts than among members of the electric railway fraternity, and the annual convention is a recognized clearing house for these ideas.

Preventive Maintenance Methods Applied to Rail Corrugation

IN LINE with the modern medical theory that it is better to prevent disease than merely to cure it, W. W. Wysor, chief engineer of the United Railways & Electric Company of Baltimore, has developed a system of removing rail corrugation before it has become serious. Details of the method used to accomplish this are given in an article appearing elsewhere in this issue. The essence of his plan is rapidity in grinding. This is effected by using a car equipped with two reciprocating grinders, one for each rail. A twofold grinding effect is produced—that resulting from the reciprocating apparatus itself and that from the movement of the car along the track.

Prior to the adoption of this method of removing corrugation the company's maintenance-of-way force was able to do no more than keep pace with the development of corrugation. While the crews were busy grinding in some places, corrugations were multiplying in other places. At the end of the year the total amount of corrugation on the system was about the same as at the beginning. Now, however, by means of the grinding, corrugations are removed much more rapidly than they are being formed. Minor corrugations are ground down before they have a chance to become serious. The grinding of new rail immediately after its installation, to forstall the development of incipient corrugation, is under consideration. It is hoped ultimately to be able to keep the entire system practically free from rail corrugation.

Factors That Affect Motor Life

MAINTENANCE of motors after they are installed under cars consists chiefly of brush replacements, brush-holder inspection, tension adjustments, gaging distance between armature and pole faces to check bearing wear and the addition of oil to the bearings. Of these, brush replacements and oiling ordinarily determine the period between inspections.

Repairs become necessary due to grounding or short circuiting of armatures or fields, excessive wear of bearings and gearing, looseness or breakage of armature bands and need for reslotting commutators. It is at the time such repairs are made or when the motors are given a general overhauling that things may be done which affect the ultimate life of the motor.

The insulation may have become dried out and baked, due to overloading, but whether or not the armature is rewound completely usually will depend on the judgment of the armature room foreman. By far the easiest procedure is to clean the armature and place a coat of insulating varnish on the exposed parts of the winding, fix up the string band, reslot the commutator and return the armature to service. If the foreman could look ahead and see the armature coming back into the shop in a few weeks due to grounded coils, he would rewind it and a service failure would be avoided.

How can exact knowledge replace guesswork in motor maintenance? In the particular instance just given severe routine shop tests afford the probable remedy. Giving the armature the overloads in current and voltage that it will have in service is not sufficient. The tests should be so severe and exhaustive that if the armature gets by, it will be sure to stay out until the next scheduled overhauling.

The useful life of a railway motor generally is determined by the frequency with which troubles occur. To eliminate the troubles, repairs must be made with the best material that it is possible to obtain and the work must be well done. It is by doing things that may seem to be not absolutely necessary, that the ultimate life is extended. Thus it is considered advisable to reband a newly-wound armature after about one year's service, as bands stretch and the insulation shrinks due to the high temperature to which it is subjected. Manufacturers recommend that armatures be dipped in insulating varnish and baked about every second year. Excessively worn bearings cause much motor trouble. Vibration and pounding cause rapid deterioration, and improper meshing of gears may cause overloads. Limits of wear should be small and bearings should be checked frequently.

There are many outside factors that influence the life of an armature. Dirt and moisture cause rapid electrical deterioration. They must be kept out. Rough track not only causes excessive vibration but overloads and severe electrical stresses due to carbons being jarred off the commutator.

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The price of freedom from service failures is eternal vigilance. The best of materials are by far the cheapest in the long run. A carefully trained organization must be created to do the work, and a definite and systematic program of overhaul must be rigidly maintained. Then the pull-in record will quickly tell the rest of the story.

Real News Still in Demand

PUBLIC utility news, if it is genuine news, frank, honest and constructive in character, is wanted today by the newspapers just as much as it ever was. There may have been some feeling in the electric railway industry that public utility news had lost its standing as a result of the recent Federal Trade Commission inquiry in Washington, and that it would be useless to make it available to the press. This is not true. The demand that has always existed still exists among high-class publications and news services. The instructions recently sent out by the Associated Press to its correspondents, as printed in the *Editor and Publisher*, reveal this clearly. These instructions say in part: "It is the business of the Associated Press to carry news. We will continue to receive press agents or anyone who has news to offer until such time as they are shown to be unworthy. . . . Letters from some correspondents indicate a feeling of resentment against publicity men and a disposition to shun them. . . . We expect our correspondents to be ready to pit their news judgment against anything that may be offered by any press agent, regardless of its disguise. If there is news in what is offered, the correspondent should not be afraid to handle it just as he would news from any other source."

The position taken by the Associated Press is in complete harmony with that of progressive railway managements. When something occurs to make real news, the alert newspapers will be glad to hear of it. No intelligent publicity man can expect to secure space in the news columns for any other kind of material. When he has real news to offer he will find himself just as welcome in the newspaper editor's office in the future as he has been in the past. When he has no real news to offer, the best thing he can do is to keep away from the newspaper office.

Southern Properties Better Their Pull-In Records

PROMINENT among the activities of the Electric Railway Association of Equipment Men, Southern Properties, is the keeping of records of pull-ins and maintenance of equipment costs of the various properties. These are prepared in chart form and distributed to the delegates in attendance at the annual meetings. At the meeting held in Cincinnati July 25-27, 1928, analysis of the reports submitted showed a pronounced improvement for each of the seven years since the organization of the association. For the first time since the institution of the graphical analysis of pull-ins the New Orleans Public Service, Inc., yields first place to another property, the Nashville Railway & Light Company. Their respective records of 111,699 miles and 112,987 miles per pull-in not only are remarkably close, but are some 46,000 miles per pull-in ahead of the next highest property.

Almost without exception the companies in the association show an improvement in their average miles per pull-in this year over last, while in only two instances has the comparative maintenance cost per car-mile increased over the 1927 figure. While equipment, maintenance methods and organization are partly responsible there is no question but that the real secret of decreased pull-ins lies in the closer co-operation which most of the properties concerned are obtaining between their mechanical and transportation departments. To the pride of workmanship of the former must be coupled a considerate handling of equipment by the latter. There must be that type of co-operation that scorns formality where the situation justifies it, that sees eye to eye and works shoulder to shoulder for the accomplishment of the greater good.

In no small measure the excellence of programs and the close attention to business which have characterized the meetings of the equipment men's association since its inception in 1921 have been reflected in service betterment on the Southern properties. The work of better informed, more forward-thinking maintenance men is bound to play an important part in making records such as have been cited here.

Record Machine Tool Performance

FOR determining the efficiency of the various machines used on different classes of work and to make proper recommendations to the management for the purchase of machine tools, the shop superintendent in every electric railway should have available at all times a complete history and performance record of every machine and tool in the shop. Too often the only record kept is in the head of the shop foreman, leaving the choice of new equipment to be determined by his unsupported opinion or by the manufacturer's representative having the best sales talk. Such slipshod methods are often one of the causes of high maintenance costs, resulting in the discouragement of proper maintenance programs.

A large industrial plant has worked out a system of records from which data can be secured on any of its machine tools employed to handle job work. Every machine is numbered and indexed so that a check upon it can be made at any time. Every five years the whole record is gone over and a study made of the tools taken out of service during that period. The records show why each machine is removed or changed from one service to another, how much is spent on each of them, how long they have been in use, the type of operator employed, whether they are on night or day work and whether they were employed in heavy or fine work.

Time studies are included with the records which show what make or type of machine does a particular job most efficiently and what men are best suited for each machine. Particular attention is paid to the life of each machine. From these records it is possible to determine whether a machine is obsolete for a particular type of work, and whether it should be scrapped or transferred to another shop where the service required is lighter. The records also show the weaknesses of various designs and construction of machines and the frequency and cost of repairs on each.

Not only will such records assist in purchasing new machines of the most suitable design but they will assist greatly in the efficiency of the machine shop. Such a system can be worked out as well for an electric railway as for a contract shop. By this means it is possible to eliminate the guess work. Cold facts on machine operation would pave the way to lower maintenance costs.

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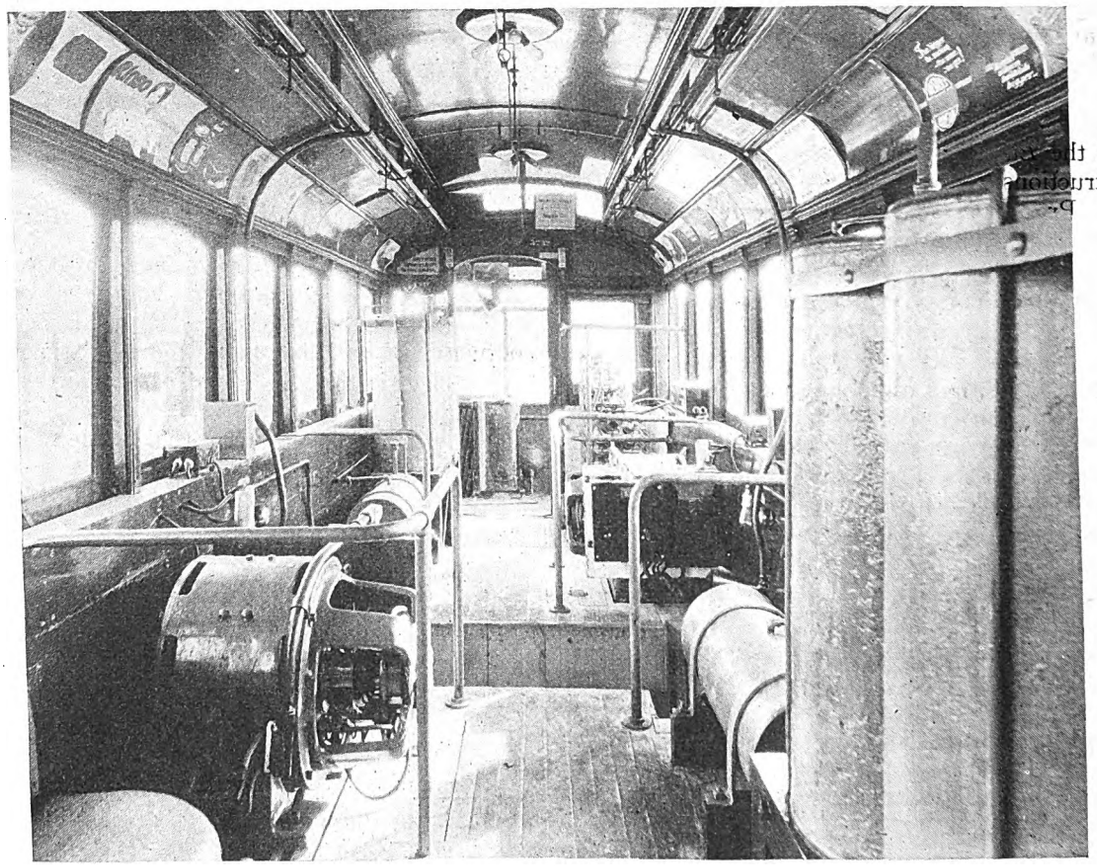
Keeping Ahead of Corrugation

Use of a special car, equipped with reciprocating grinders, enabled the United Railways & Electric Company of Baltimore to grind as much rail during the first six months of 1928 as was covered formerly in a year's time

By W. W. Wysor
Chief Engineer United Railways & Electric Company, Baltimore, Md.



Interior of car showing motors for operating the grinders, storage tanks for water, and at the far end of the car the resistance grids for operating the car at low speed

The speaking tube for communicating with the motorman may also be seen against the side of car where the grinder sits and in the motorman's vestibule directly over the controller.

RAIL corrugation is a problem that has harassed the electric railway industry for many years. It has been studied by many committees of scientific bodies and various theories have been advanced to account for it. While the scientists have been busy endeavoring to locate the cause of this trouble the way engineer has been faced with the task of removing the corrugations already in existence.

It has been the practice of the United Railways & Electric Company of Baltimore to remove corrugations by means of reciprocating grinders. The rotary type, however, has been used sometimes on very heavy corrugation for doing the rough work, being followed by the reciprocating grinder for the finishing. It is felt that better work can be done with the reciprocating type of grinder since the grinding brick moves in a plane parallel with the rail surface and there is no tendency to grind cups in the rail as is sometimes the case with the rotary grinders.

On this property we have about 250 miles of paved track on which most of our corrugation occurs. All of the corrugation that is really serious occurs in paved track. For a number of years we have ground out an average of 100,000 ft. of corrugation per year but we have never been able to catch up with the work. In other words, at the end of each year there appears to be as much corrugation as there was at the beginning. The reason is that we have been grinding only the heaviest corrugation because that is the most important, and by the time we got around to grinding the lighter corrugations, they had become heavy. With this situation facing us we began to seek some way of removing corrugation

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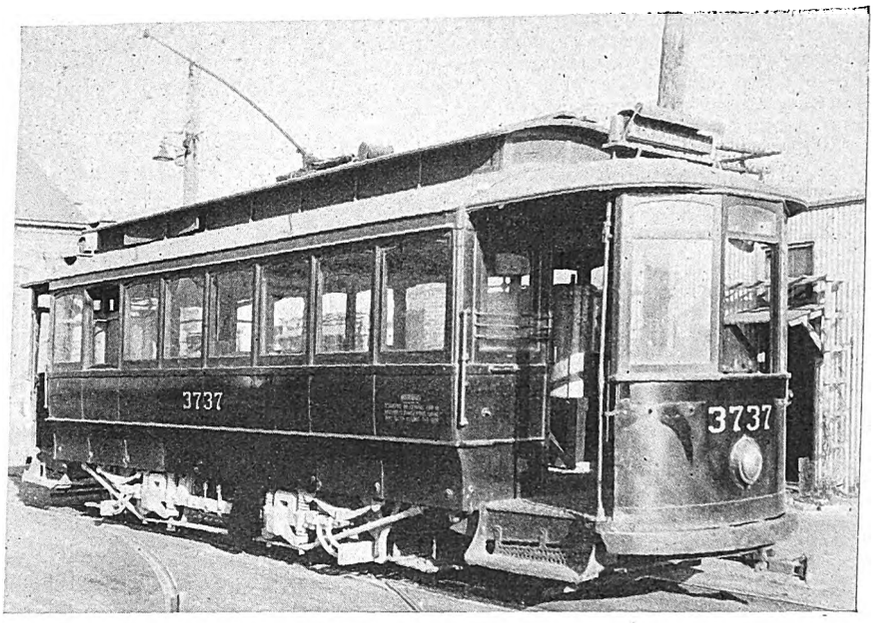
more rapidly and, if possible, with less expense. With this end in view we considered the construction of grinding equipment which might be attached to a car and operated over tracks along with other equipment.

At that time several grinding cars had been constructed and were in operation on various electric railways. Most of these we examined before undertaking the construction of a car for this property. On these cars the grinding bricks were stationary and the cutting action was obtained by dragging the car along the track. We were convinced that this was not the proper method because it did not give sufficient grinding action, and moreover, did not permit intensive grinding at spots where heavy corrugation occurred. At this stage in our deliberations we conferred with the Railway Track-Work Company of Philadelphia. This concern undertook the design of special reciprocating grinders which could be installed on one of our obsolete single-truck passenger cars. The equipment which they designed and which has been installed in a car has proved to be very efficient and satisfactory in the removal of corrugation.



General view of the exterior of the grinding car

Grinders Operated at High Speed

This equipment, which was described in Electric Railway Journal for June 23, 1928, consists of two independent reciprocating units installed one on each side of a single-truck passenger car having a wheelbase of 7 ft. 6 in. Such alterations were made to the car floor as were necessary to accommodate the grinding equipment. Each grinding unit consists of a frame carrying four grinding bricks and machinery similar to the reciprocating grinders which have been manufactured for many years by this company. The power for driving the bricks is delivered by a 10-hp. motor, through a silent chain drive. The speed at which the bricks reciprocate is 600 strokes per minute or about double the speed of the ordinary reciprocating grinder.

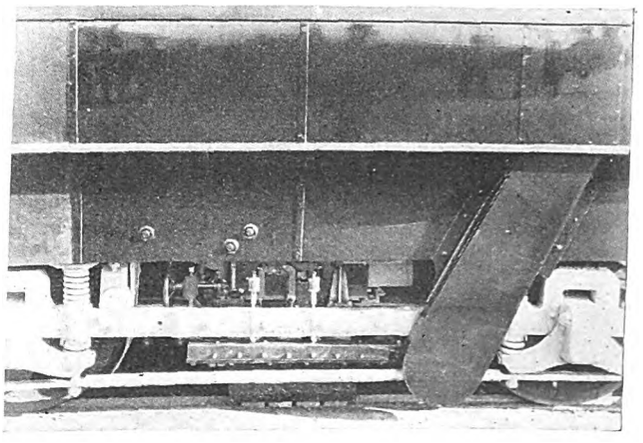
The car is equipped with tanks which supply water for grinding and with banks of resistance which make it possible to operate the car at any desired speed from a mere crawl up to the normal speed of passenger cars. Convenient seats are provided for the operators whose duty it is to raise and lower the bricks as may be necessary. This is done by a hand wheel. There is also a hand wheel for tightening the blocks in the holder after they have been raised or lowered. Nearby is a valve controlling the water supply. The car is equipped with lights for night grinding. A speaking tube for communicating with the motorman is provided and an electric bell which indicates when the maximum working pressure of the bricks on the rails has been reached. This car may be operated at full speed in between passenger cars which gives a double grinding action; that is, grinding action results from the car dragging the bricks over the rail in addition to the reciprocating motion. The car may stand still and grind or move at any desired speed.

Where there is light corrugation over a considerable stretch of track the car can be worked to advantage during the day, especially if the headway between passenger cars is not too great. The grinding car is shunted back and forth between permanent cross-overs or other forms of special work which will permit it to shift from one track to the other. Where heavy spots of corrugation occur the grinding car is brought to a standstill, or nearly so, and it then proceeds to grind until it is necessary to move out of the way of approaching passenger cars. Then the grinding car with the grinding machinery still in operation moves along to the nearest cross-over, crosses and proceeds to some heavily corrugated spot on the other track where it is again slowed down until necessary to move out of the way of traffic. By this means the light corrugation is all ground out during shifting operations and the heavy corrugation in between regular car movements. However, as a matter of course, the most efficient work can be done when there is the least traffic and consequently we do most of our grinding at night.

Better Work Can Be Done at Lower Cost

Some of the advantages of this type of grinder are as follows:

1. It is a standard piece of rolling stock, self-propelled and capable of making the same speed as passenger cars. It can, therefore, be stored readily at any convenient carhouse or yard and be moved to the job without difficulty or outside help of any kind.
2. It is not necessary to interrupt traffic as the grinder can move out of the way of approaching cars.



Close-up of the grinding brick and the operating mechanism. The housing covering the chain drive may be seen on bottom

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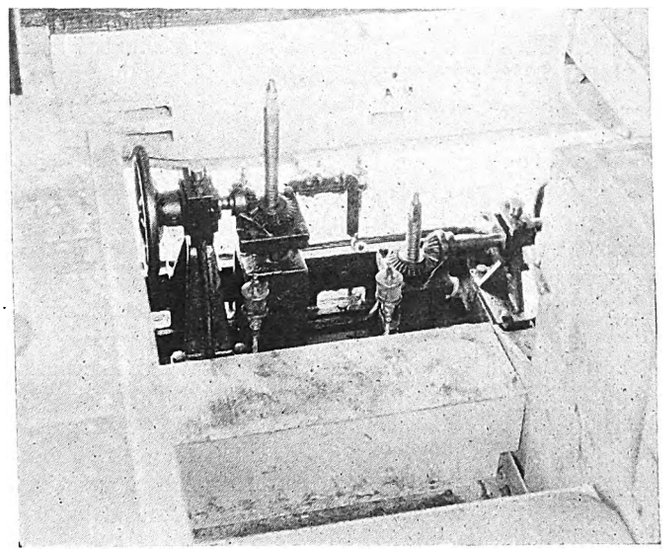
3. It is not necessary to remove the grinder from the track as is the case with other equipment when working under traffic, and consequently there is no obstruction to free wheel traffic.
4. The men using this equipment are better protected than those using other types of equipment as they are inside the car and are safe from being struck by passing automobiles, or by passenger cars as sometimes happens with small equipment.
5. Work can be carried on during cold or rainy weather, as the men are protected from the weather because they are inside the car. In fact, we find it advantageous to do grinding in rainy weather, as little cooling water is required.
6. Better work can be done because the truck with its wheels resting on the rail forms a perfect guide.
7. Work can be done much more rapidly with this grinder than with any other type with which we are familiar.
8. The cost is less.

For a number of years the equipment for grinding corrugation and joints on this property has consisted of four reciprocating grinders. It has been our custom to keep three of these in service, the fourth one being held as a spare. As it requires a crew of three men to handle each grinder our total corrugation grinder force consisted of nine men. The new grinding car requires a crew consisting of one motorman, one conductor and two grinders.



Inside the car, showing the operating mechanism for raising and lowering the bricks and for tightening them in the holder. The floor has been cut away to accommodate the grinders

This car was put in service Dec. 5, 1927, and has been in almost constant use ever since. During the first six months of 1928 we have ground as much rail with this car as we usually grind in a year's time with the ordinary reciprocating grinders. The average cost per foot of rail for work with this car is about one-third of the cost of grinding with the ordinary reciprocating grinders. The car has actually paid for itself the first six months it has been in service, and we expect not only permanently to reduce the unit cost of grinding, but also, to catch up with the work. Instead of grinding heavy corrugation all the time as has been necessary heretofore, we expect to catch it in its incipiency and prevent its ever becoming heavy.

Grinding New Rail Proposed

Sometimes in running this car over tracks where light corrugation appeared only in spots we discovered that the track was corrugated for its entire length. The first passage of the car brightened up the high spots so as to make the corrugation show up which was otherwise invisible. This has brought us to the conclusion that perhaps it would be a wise thing in laying new track not only to grind the joints, as has been our practice heretofore, but to run this car over the entire stretch so as to take out any mill corrugations or other irregularities that might exist in the rail surface and thus remove physical imperfections that may be the beginning of corrugation.

German State Railways Build Large Shops

In preparation for the electrical operation of the Stadtbahn large overhaul electric railway shops have been erected near Berlin

EQUIPPING of the Berlin Stadt- und Vorortbahnen with the 800-volt direct-current system is being pushed rapidly by the German State Railroads, the owner of the property. Particulars of the rolling stock and electrical distribution system of this railway were published in the issues of this paper for Nov. 3 and Nov. 27, 1927. In connection with this electrification, extensive shops are being built at Nieder-Schöneweide, in the neighborhood of Berlin. These shops were begun in August, 1926, and were so far along in the autumn of 1927 that some of the work of the electrical equipment of the cars was carried on in them at that time. The accompanying airplane photograph was taken in July, 1927. Being the latest large electric railway shops in Germany, the layout should prove of interest.

As will be seen from the plan, the car-body shop has three bays which together have accommodation for 66 car bodies, each bay being served by a traveling crane. There is space to the left for the later erection of another bay with accommodations for 24 more bodies.

On the opposite side of the body shops, extending the full length of the building, is the department for miscellaneous electrical equipment, then in turn, departments for motors, brake parts, and wheels and trucks. Beyond these sections is space for expansion and beyond this, in the open, are short storage tracks for trucks, axles and wheels. This open section is served by a transfer table.

The paint shop is in a building by itself on the eastern side of the main building. The offices are four and five stories in height, and are shown in the center of the airplane photograph. The storage buildings are at the opposite, or northern end.

As will be seen from the plan, cars for overhaul enter on one of the tracks on the left-hand or farther side of the shop and first pass through the wash room. They then proceed until they reach the body shop, where the bodies are lifted off the trucks by cranes and are set in any position desired in the shop. The trucks continue on the original track, but a little further along the motors and brake equipment are removed. The trucks are then taken to the cleaning tanks, after which they pass to their own appropriate section.

After overhaul, the car is assembled and passes out of the shop on a track on the southern end of the building.

After the completion of construction, it is the intention of the management to plant the area in front of the shops with shrubbery and flowers, so as to make the approach attractive.

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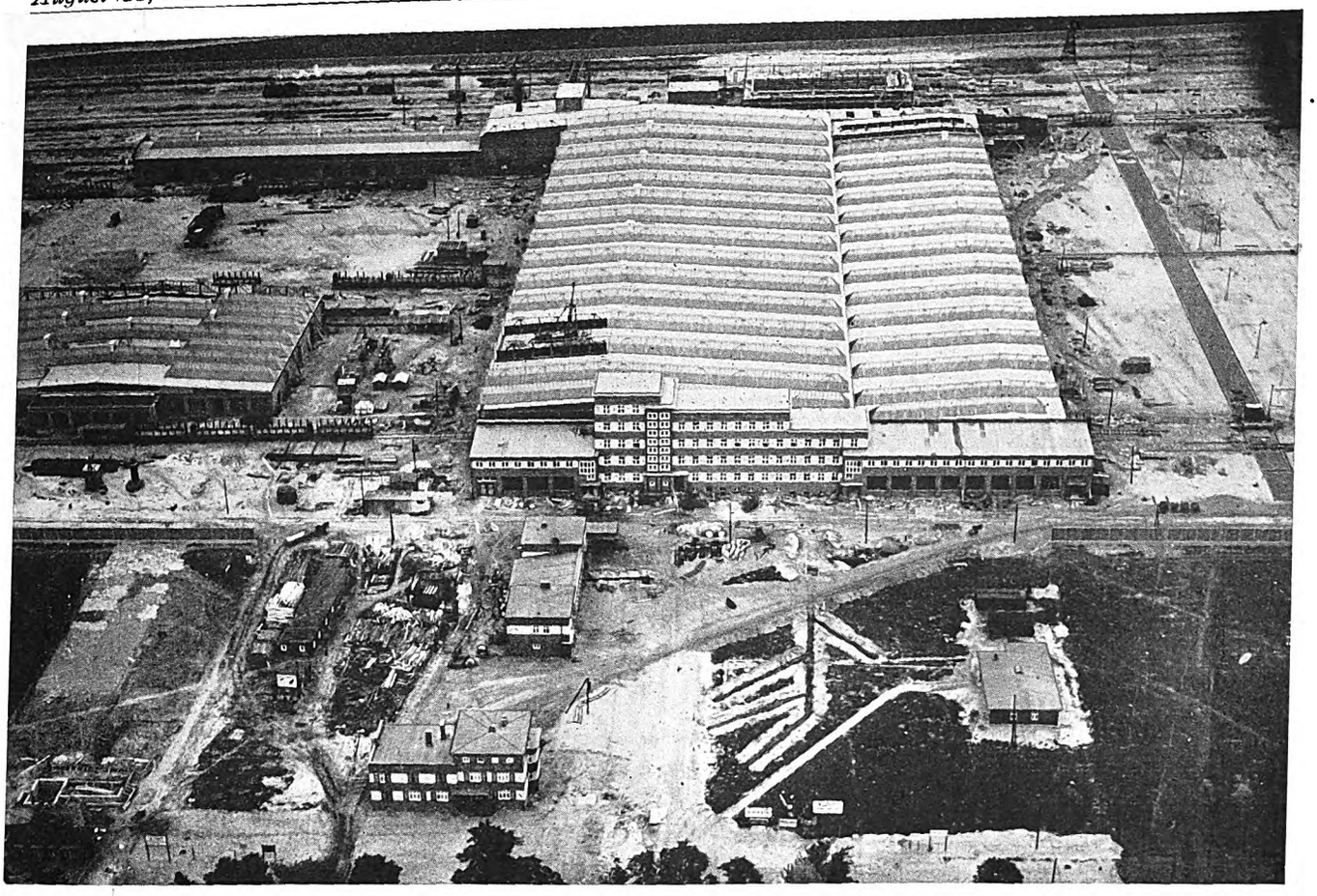
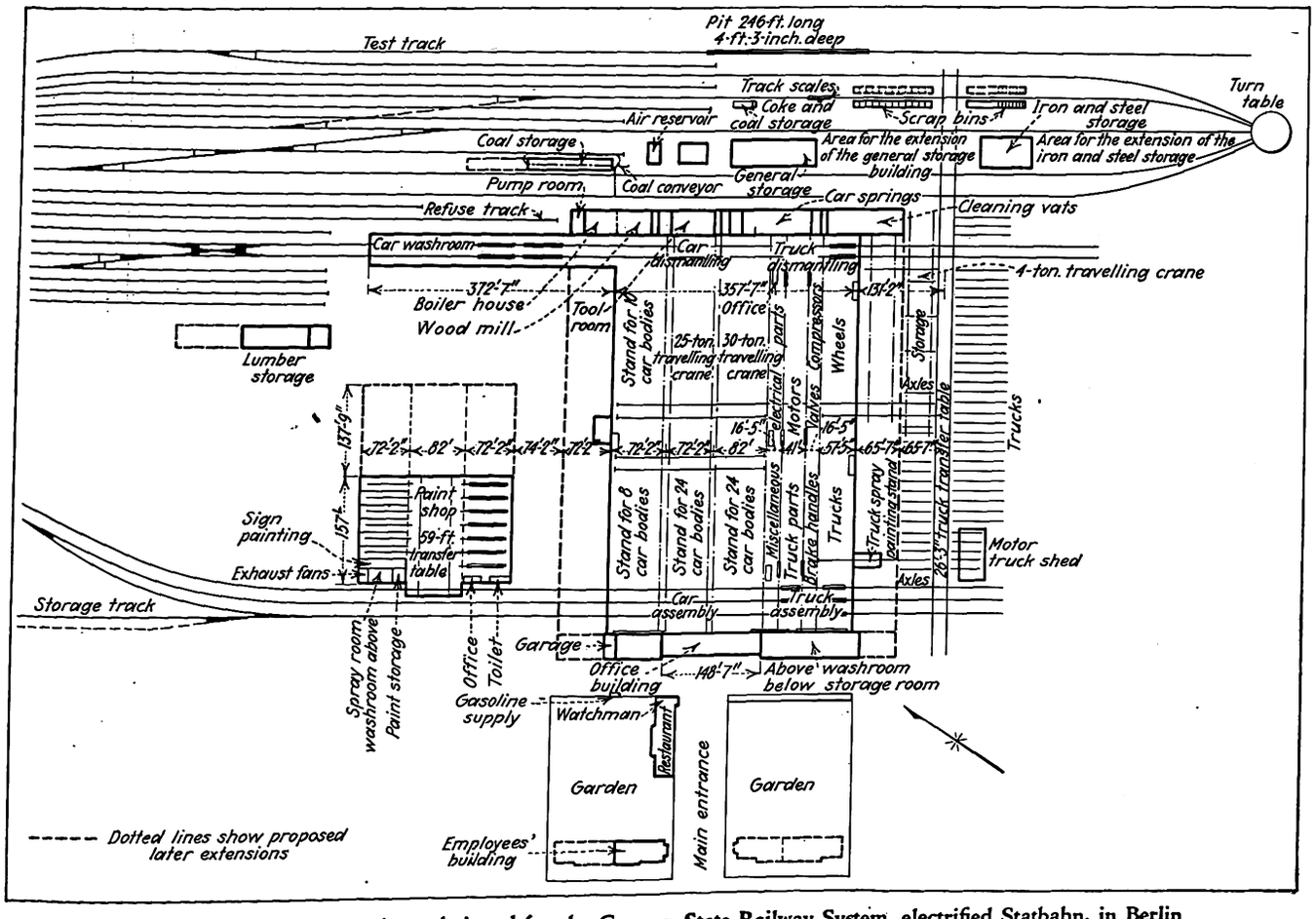


Airplane view of the new Stadtbahn shops serving the electrified Berlin system



These new large shops have been designed for the German State Railway System, electrified Statbahn, in Berlin

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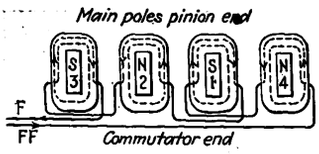


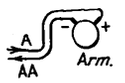
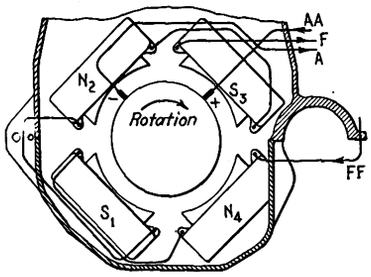
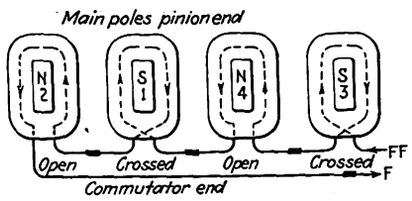
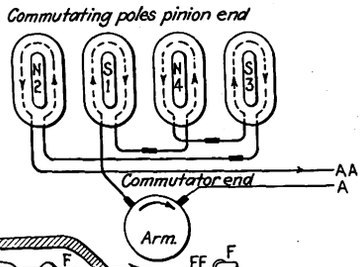


Fig. 5—Field connections for non-commutating pole motor







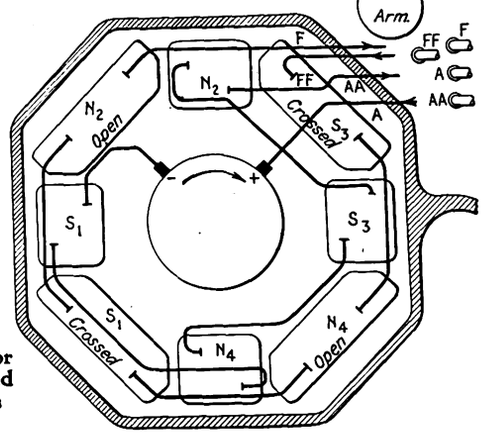
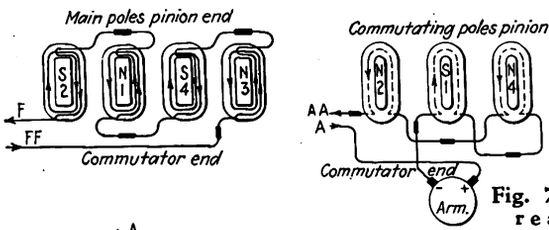


Fig. 6—Wiring for open and crossed main field coils



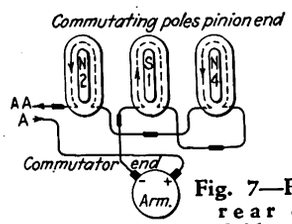
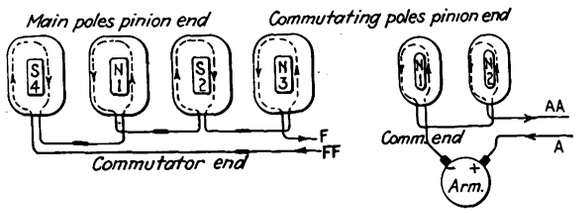


Fig. 7—Front and rear connected fields in motor with three commutating field coils



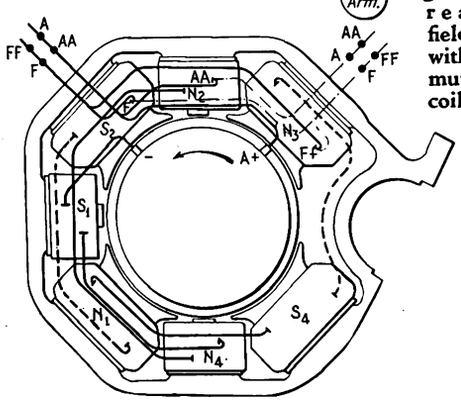
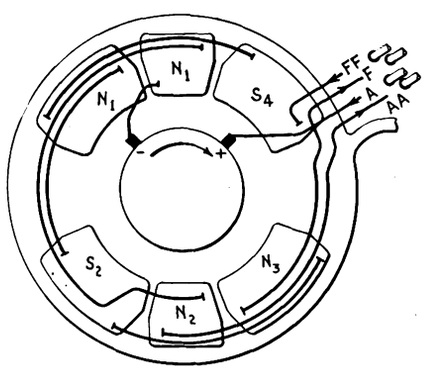


Fig. 8—Field connections for motor with two commutating field coils



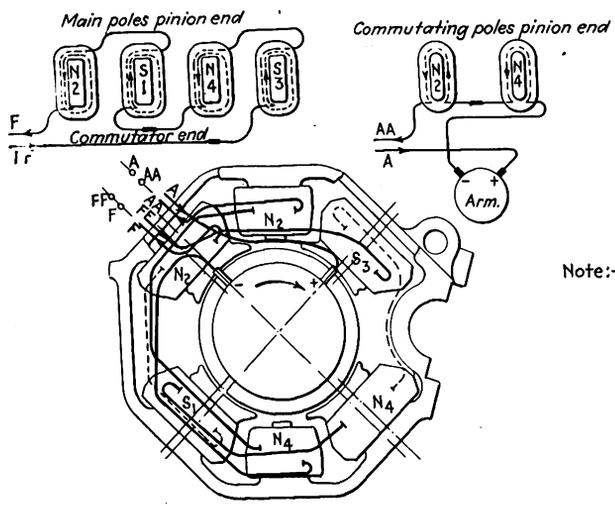


Fig. 9—Front and rear connections used on motor with two commutating field coils

Note:- Dotted lines show connections at pinion end Full lines show connections at commutator end

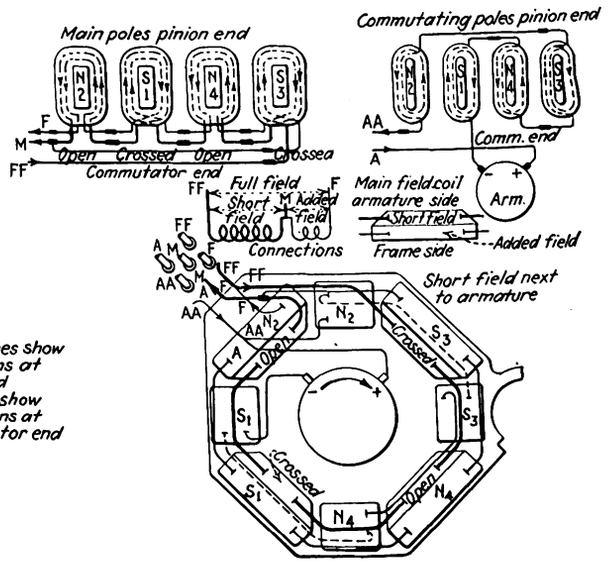


Fig. 10—Diagram of field connections for motor with short and added field windings

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Making Certain That Field Coils

Are Assembled Correctly

Motors with a main field coil or a commutating field coil reversed will have poor commutation with resultant overheating and flashing. Some simple precautions will insure that all connections are made properly

By Jesse M. Zimmerman

Maintenance Sales Engineer Westinghouse Electric & Manufacturing Company

LACK of proper knowledge of assembling field coils in the motor frame has caused many motor failures. If one or more of the main field coils are connected so the current passes through them in the wrong direction the total magnetic field flux will be decreased. This will cause the motor to turn at a higher speed than normal and when placed under a car it will hog the load, so that the armature soon will roast out. Motors having field control are connected up wrong even more easily. Reversed commutating field coil connections cause the motor to commutate poorly and flash easily.

In the non-commutating pole motor there is ample room to bring the leads of the field coil out of the side near the end. The advent of field coils with cable leads has made it easy to trace the winding in the coils. This type of coil, shown in Fig. 1,* is known as the open coil with side end leads. The wiring around the frame is on the commutator end of the motor, as shown in Fig. 5.

The commutating pole type of railway motor usually has four commutating poles. The space between the coils is so small that the leads must be brought out at the front end of the coil. The wiring around the frame may be simplified and loose crossing of the main field connections eliminated by using alternate open and crossed main field coils with front leads, soldered and tied inside of the coil. However, it is very important that the principle used in these coils be understood thoroughly and that they be connected carefully to obtain the proper polarity. Open and crossed types of coils are thus explained:

1. The open coil with front leads shown in Fig. 2 has the cable connected to the end of the field coil, so that the cables and the conductors to which they are connected are less than a full turn. It is marked by a letter O to identify it. Unless this identification is preserved, the coil is liable to be used as a crossed coil, thereby reversing the polarity.

2. In order to alternate the direction of the flow of current through adjacent field coils without reversing the external connections the crossed field coil is used. The cable leads are so connected to the coil ends that the cables and the conductors to which they are connected complete more than a full turn. It received its name because the cable leads cross inside the coil.

**All field diagrams show coils as laid out on a work bench with the armature side up. All diagrams of coils assembled are shown looking at the commutator end.*

The method of placing the open and crossed main field coils is shown in Fig. 6. Here the wiring around the frame is done at the commutator end. With this type of connection the commutating coils may either be open with front cable leads, or have front and rear cable connections.

Due to mechanical limitations it often is necessary to make part of the main field coil connections at the pinion end of the frame. This necessitates the use of the front and rear connected main field coil shown in Fig. 4. The open type of commutating field coil is used. First the two north pole coils are connected together, then they are connected to the south pole coil to the AA side of the armature. See Fig. 7.

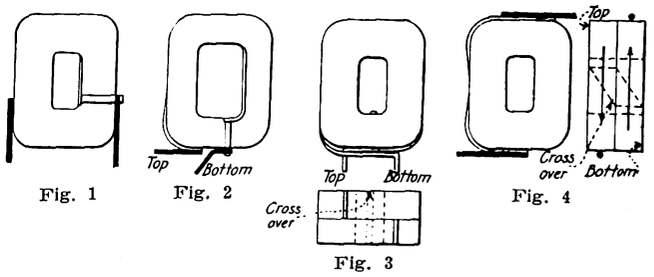

Fig. 1 Fig. 2 Fig. 3 Fig. 4

Fig. 1—Open type field coil with side end leads
Fig. 2—Open type field coil with front end leads
Fig. 3—Closed type field coil
Fig. 4—Strap-wound field coil with front and rear leads

Sometimes only two commutating poles are used. This type of motor generally uses the open type commutating field coils with front cable leads. On some motors of this type the main field coils are all of the same type, the current being reversed through them by crossing the leads on the exterior of the coil as shown in Fig. 8. On others the front and rear cable lead construction is used. See Fig. 9.

The wiring around the frame of a motor having field control is very complicated. Therefore it is important that the internal wiring of the field coils be understood thoroughly so that correct polarity may be obtained. Coils designed for field control motors have two sections, namely: (1) Short or permanent field, which is connected continuously during the use of the motor and (2)

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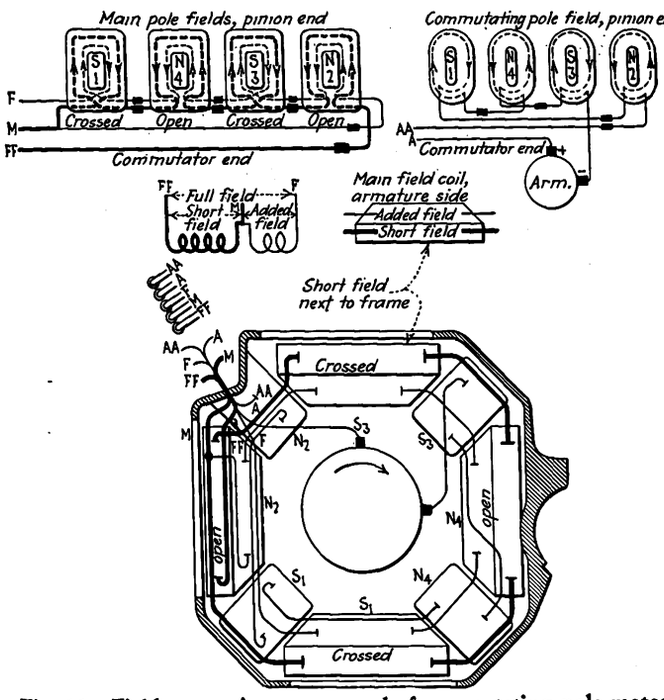

Fig. 11—Field connection on one end of commutating pole motor with short and added field windings

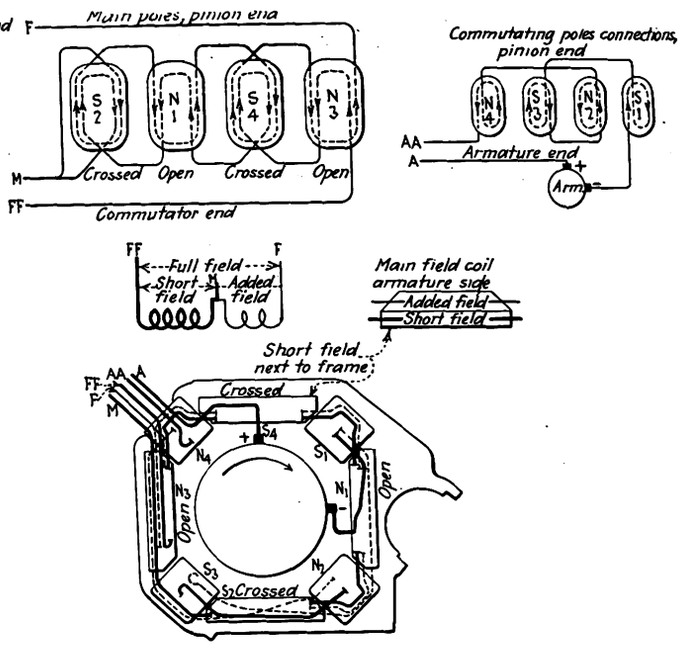

Fig. 12—Crossed and open construction used to reverse current in alternate coils

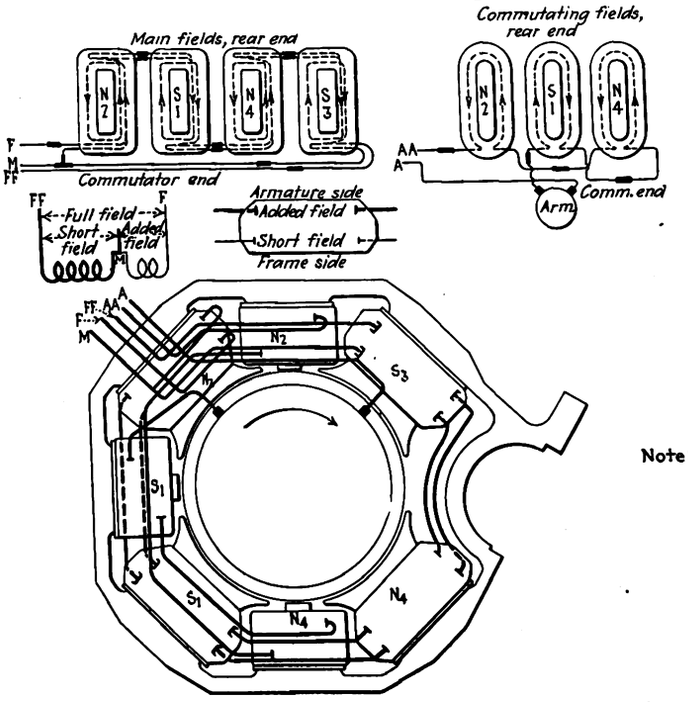

Fig. 13—Leads brought out on suspension side of field control motor

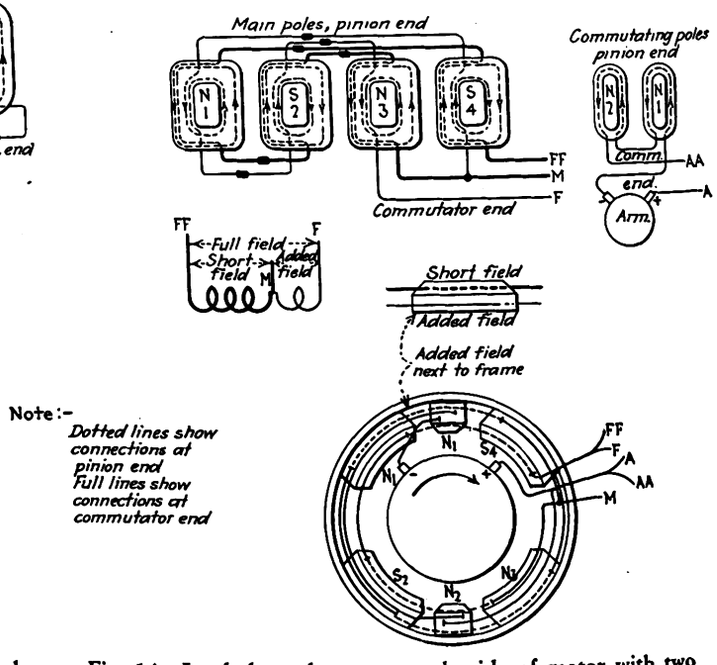

Fig. 14—Leads brought out on axle side of motor with two commutating field coils

additional field, which is used only to increase the field flux to give a higher torque at starting without excessive armature current.

The short field which is usually next to the motor frame, is shown in the schematic diagram by heavy lines because the size of the conductor is larger. The additional field is usually next to the pole face and is shown in the schematic diagram by lighter lines. Since this part of the field is used only during starting the size of the conductor can be made smaller in order to allow as much space as possible for the permanent section.

The short field and additional field leads are brought out at the front end of the coil, the current being reversed by using alternate open and crossed coils when the design permits. See Figs. 10 and 11. Where the design allows only a small space it is necessary to bring the short field leads out of one end of the coil, while the additional field leads are brought out at the opposite end. The crossed and open construction is used to reverse the current in alternate coils, as shown in Fig. 12. The front and rear method of bringing out the leads on field control motors seems very popular where it is necessary to use only two or three commutating poles. See Figs. 13 and 14. The design and method of connecting the commutating field coils for these different types of main field windings are shown in their respective diagrams.

There are several necessary precautions to follow when connecting up the coils in a field control motor. They are:

1. After the coils have been connected the polarity of the permanent field M-FF and of the addition field F-M should be checked separately to make certain that the

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polarity of the two parts of the main field are the same.

2. A check should be made to ascertain that the additional field FM is cut out for high running speed.

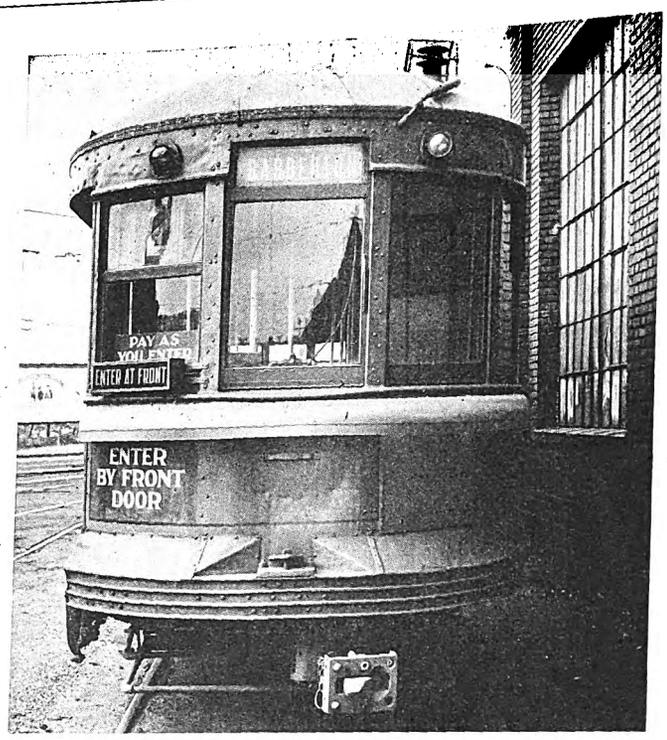
3. The additional field can not be distinguished from the short field by checking their resistances, as these results may be misleading. Sometimes the additional field may have a higher resistance than the permanent field, due to the difference in the copper cross sections.

4. The coil should be placed in the frame according to the diagram supplied by the manufacturer. Usually the permanent field is next to the frame; however, sometimes it is next to the armature.

Testing for Reversed Field Coil Connections

When the field coils are connected in the motor frame, a check is necessary to see that the current passes through them in the correct direction. If they are not connected properly the motor will tend to rotate at a higher speed, thereby taking more than its share of the load. The test can be made by passing current through the main field coils while holding a compass to the corresponding end of each coil and noticing which way the needle points. The polarity of the commutating poles should be checked in the same manner under a separate test. If the polarity of the main end commutating coil fields have been checked it is necessary then to check the polarity of the two poles together. If the motor does not have an armature in the frame it will be necessary to short-circuit the brush-holders. The negative side of the armature should be connected to the positive side of the main field, the negative side of the main field to ground and the positive side of the armature to trolley through a suitable resistance to limit the current. The polarity of the main pole should be the same as that of the commutating pole next to it in the direction of rotation when facing the commutator end of the motor.

Polarity may be tested by use of two iron rods with long wooden handles fastened to their centers. After the fields have been energized with a small current the ends of the rods are placed on two adjacent pole tips. If the rods are drawn together the polarity of these poles is opposite. If there is no attraction the polarity is the same. Therefore, when testing for polarity of adjacent main field poles the rods should be attracted to each other. But when testing to see if a main and commutating pole are of the same polarity there should be no attraction between the iron pieces.

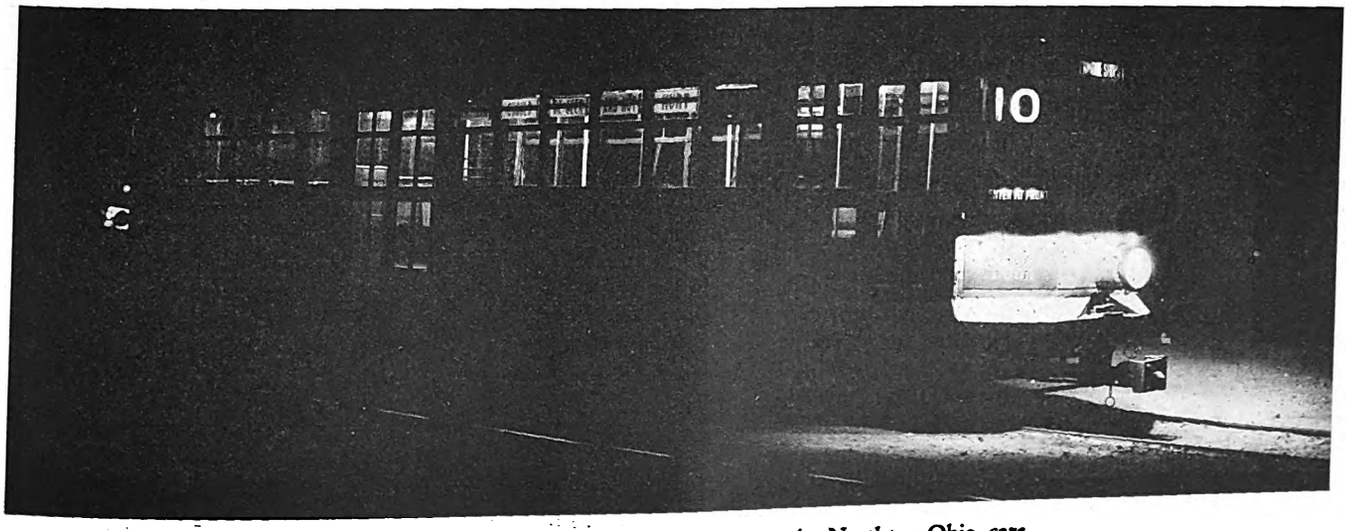


The reflector containing five 100-watt lamps is mounted under the belt rail of the car

Dash Lighting Attracts Attention

GLARE from powerful headlights such as are used frequently on interurban cars is objectionable on city streets. On the other hand, the headlights ordinarily used on city type cars are dull and dim and in stormy or foggy weather can hardly be seen.

The Northern Ohio Power & Light Company, Akron, Ohio, has developed a scheme of front illumination which not only makes the car visible in bad weather but adds considerably to the attractiveness of the car's appearance during the night hours. A covered-type reflector has been mounted under the belt on the front end of each car. In this reflector, which is made of 16-gage metal, are mounted five 100-watt lamps. It is so shaped as completely to conceal the lamps from the eye, thus eliminating any direct glare but illuminating the entire front dash of the car. As the standard color of the cars is orange the illumination gives a pleasing effect.



The effect at night of the illuminated dash on the Northern Ohio cars

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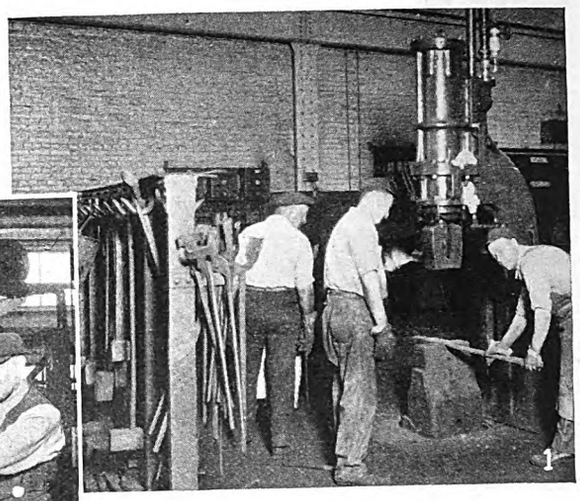
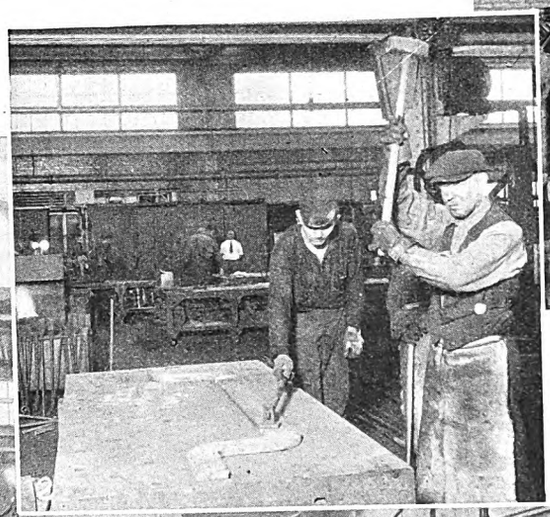
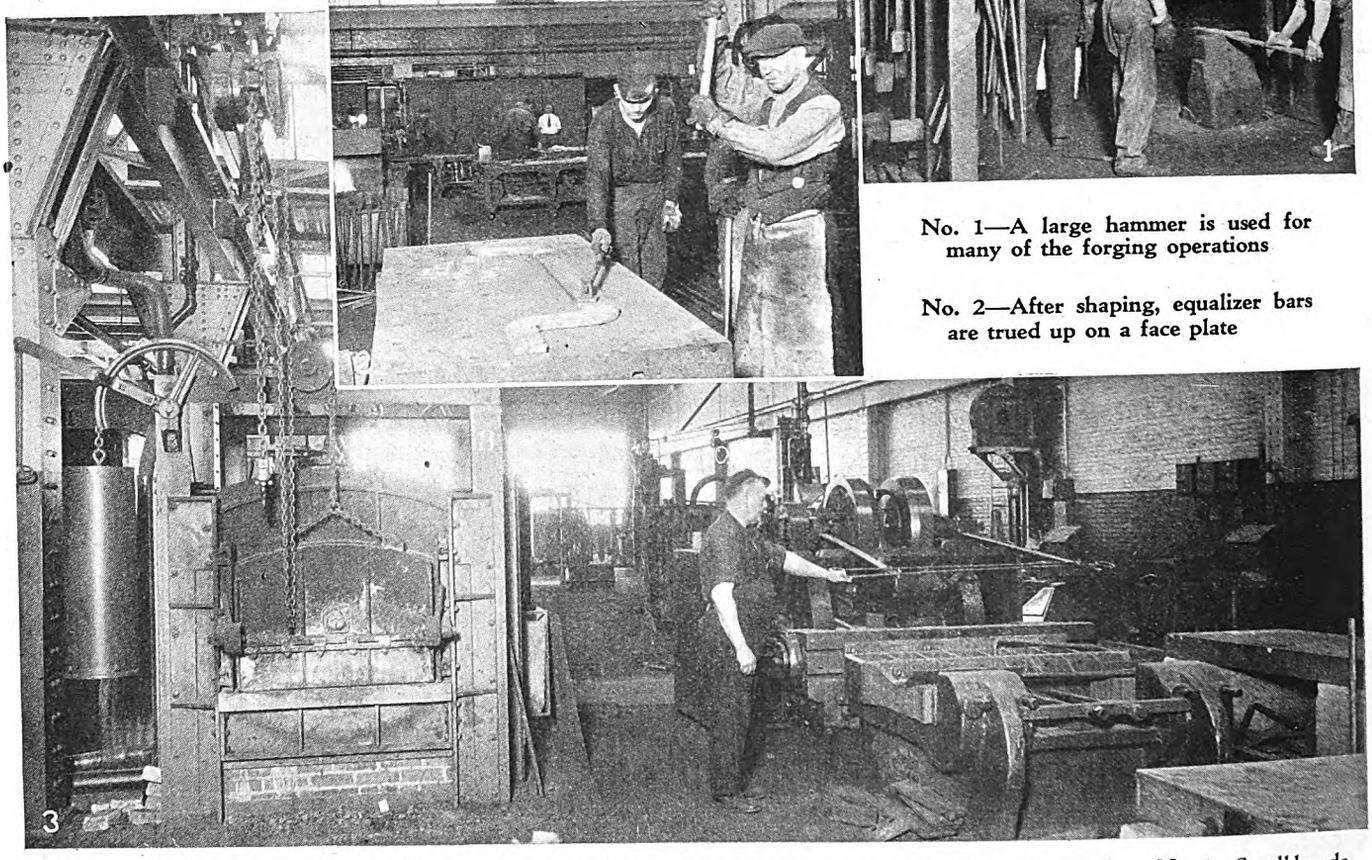
Some of the Tools That Lighten the Shop Man's Work



No. 1—A large hammer is used for many of the forging operations

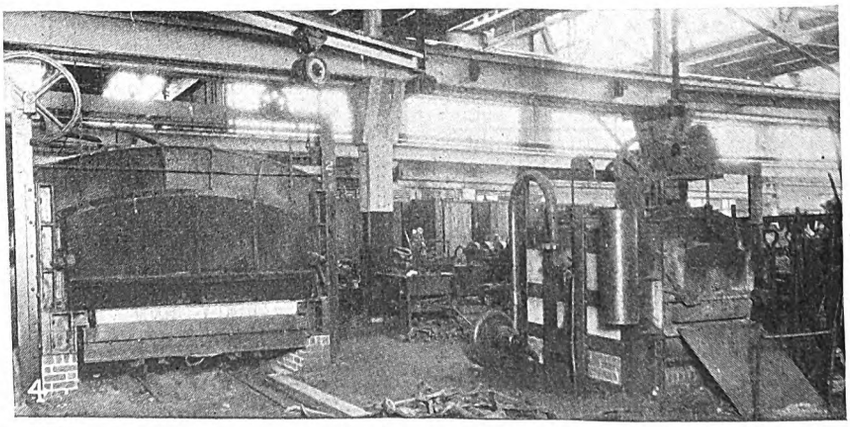


No. 2—After shaping, equalizer bars are trued up on a face plate



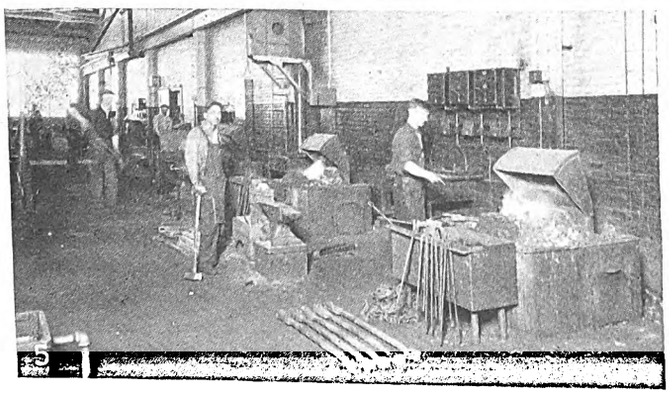
No. 3—A bulldozer is used for shaping various parts. The furnace on the left serves the bulldozer

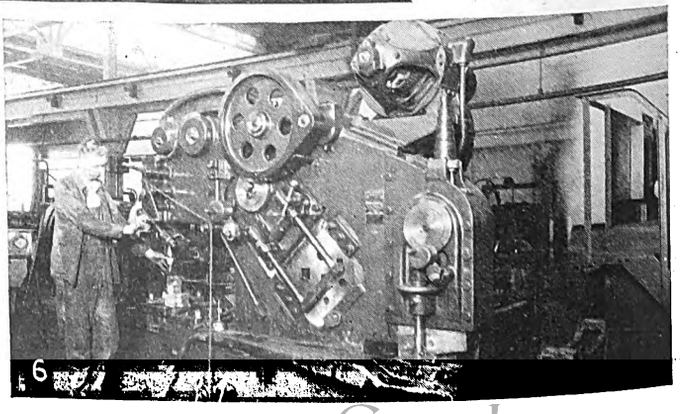
No. 4—The large annealing furnace at the left has tracks so that a small car can be rolled into it when loaded with material. A case-hardening furnace is shown at the right



No. 5—Small hoods at the back of forges remove all smoke and fumes so that the air in the room is clear

No. 6—A large punch and shear is used for cutting bar stock and various standard steel shapes to required lengths





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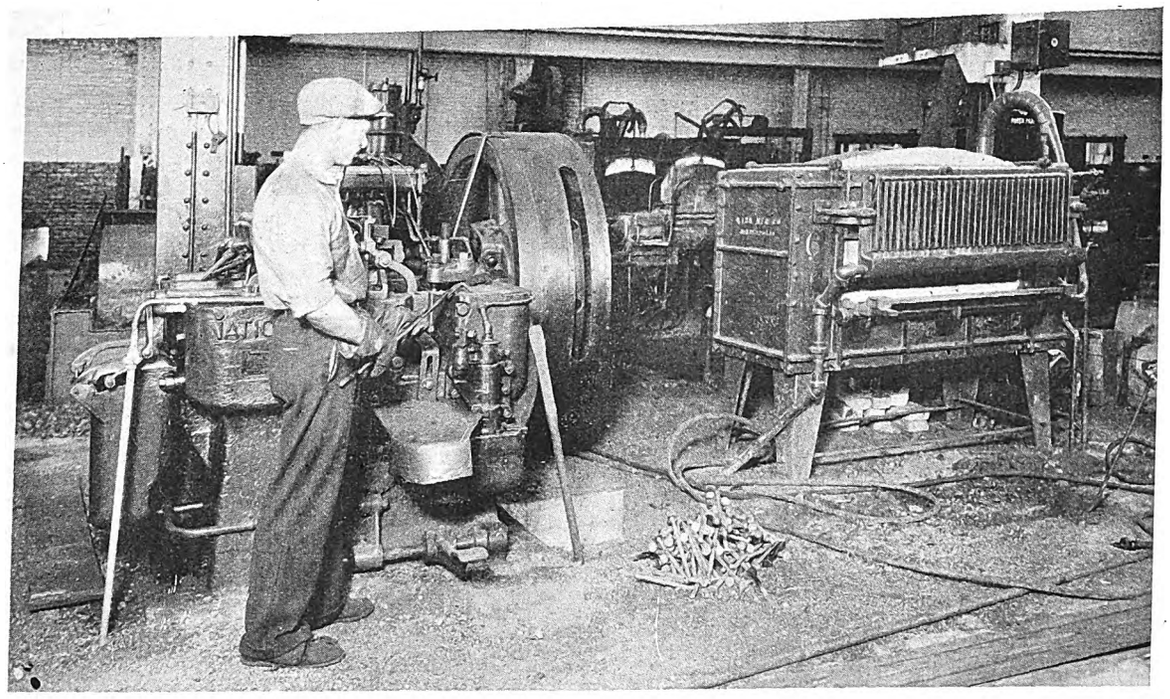
MODERN TOOLS

Make Forge Shop Attractive*

By Clarence W. Squier
Associate Editor *Electric Railway Journal*



A heading and upsetting machine is used for forming special bolts, rivets and putting heads on long bars. The furnace for serving this machine is shown at the right

In Coney Island shops of the Brooklyn-Manhattan Transit Lines heavy forgings are made with air hammers, bending and shaping of large parts is done with bulldozers and bars are cut with a punch and shear. Oil furnaces heat material for all heavy operations

BLACKSMITH shops of most electric railways are hot and dirty. An exception to such is that of the Brooklyn-Manhattan Transit Lines at the Coney Island shops. An efficient system of forced ventilation keeps the department cool even on hot days and the forges are of the latest design. Electrically driven blowers furnish the draft and all smoke is removed by an exhaust fan connected through underground ducts to hoods over the fires. Skylights in the roof make the department very light even on dark days. Drinking fountains and shower baths add to the comfort of the workmen, especially in hot weather.

The blacksmith shop occupies a floor space 200x80 ft. and the floor is of cinders around the forges and working tools, but two wide trucking aisles of concrete extend across the shop. The west side has a cement floor 10 ft. wide. The section around the electric welding booths also has a floor of cement. As all material is handled into and out of the department by electric trucks the cement flooring makes rapid movement possible.

The department storage for iron and steel is just outside. A space 7x20 ft. is used for this. There are two iron and steel racks, one 14 ft. 1 in. by 20 ft. by 7 ft. 3 in. and the other 18 ft. by 20 ft. by 7 ft. 3 in. The space adjacent to the racks is provided with an overhead traveling crane and heavy material is also handled very efficiently by electric crane trucks.

As mentioned in the previous articles describing equipment and methods used in these new shops, departmental storage of material and supplies is an outstanding feature. In the forge-shop section a space 20 ft. wide and 200 ft. long just outside the west wall of the shop is used for storage of blacksmith material. Coal is kept in two rooms with openings both outside and into the forge shop. The steel metal racks present a neat appearance and give convenient access to the material. Various special dies and tools used in the many

*This is the sixth article describing methods and equipment of the Coney Island shops of the B.-M.T. Lines. Others were, "Truck Overhauling," published April 21, 1928; "Intermediate Truck Repairs," published May 5, 1928; "Wheel Gear and Axle Maintenance," published May 19, 1928; "Motor Overhauling," published June 16, 1928; and "Bearing Practice," published July 21, 1928.

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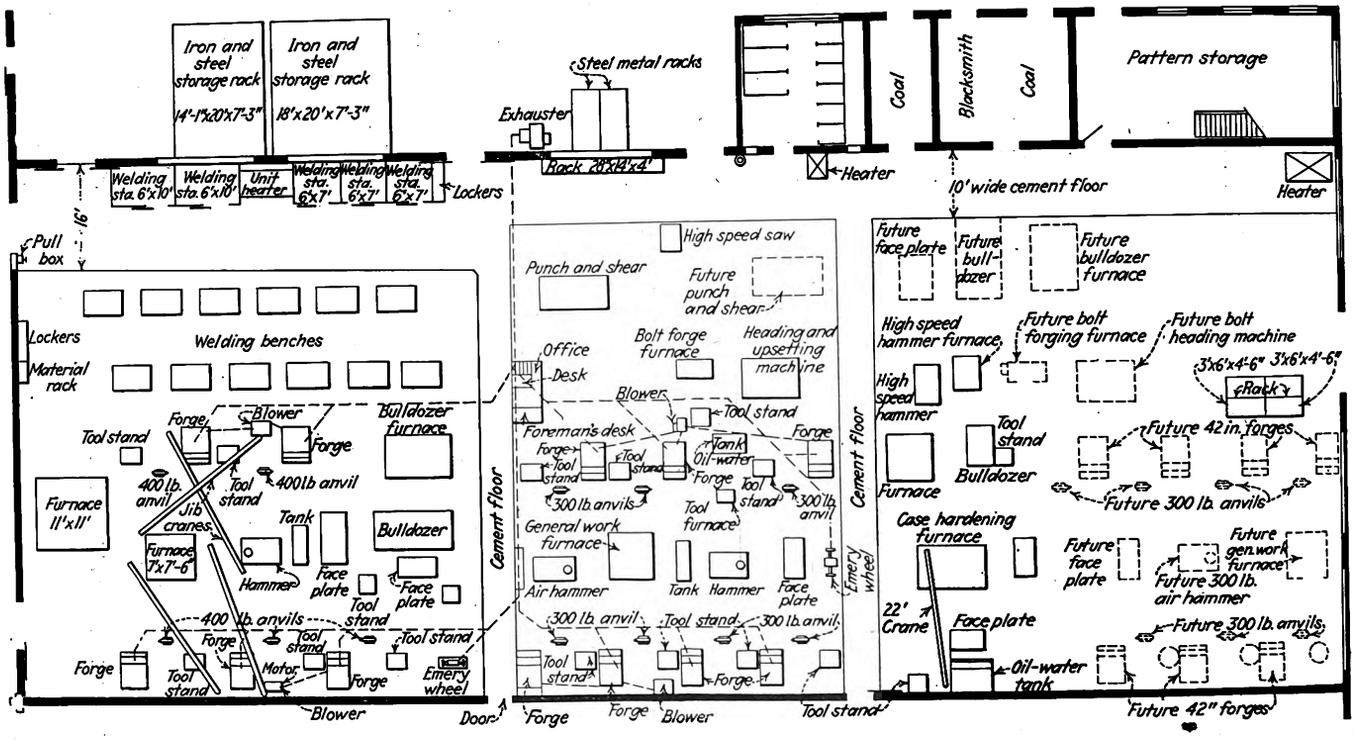
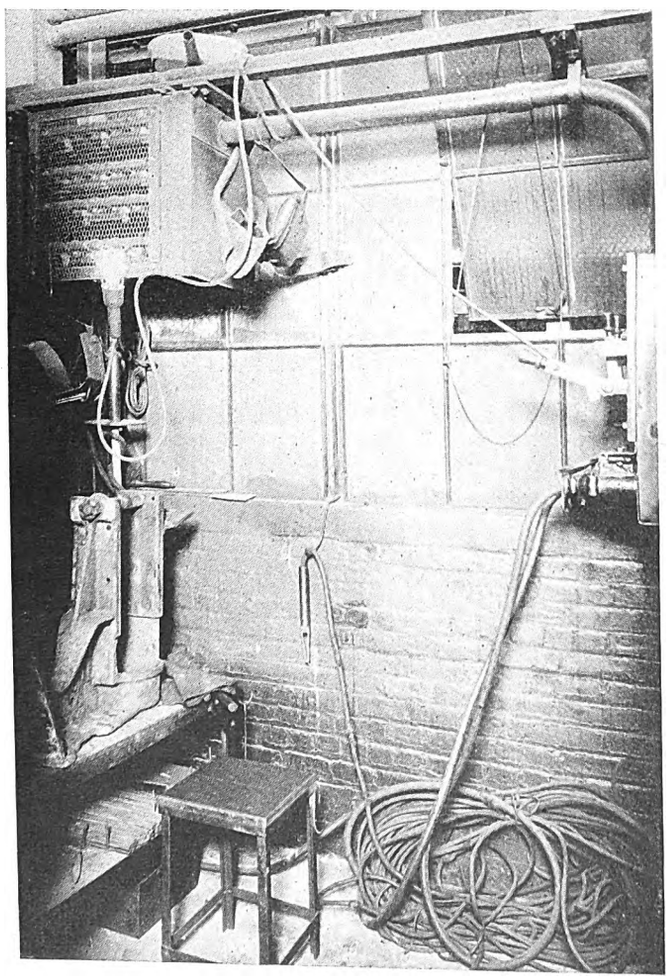


Floor plan of blacksmith shop, Coney Island shops of Brooklyn-Manhattan Transit Corporation

forging operations are kept close at hand in specially designed tool racks.



Interior of one of the electric welding booths. Control switches are shown at the right. Long leads can be plugged in so that welding repairs can be made at a considerable distance outside

In providing the equipment for the blacksmith shop the fact that repair work is the major requirement has been kept in mind. Most of the work done consists of filling in and building up worn surfaces, cutting out and setting in new sections in various parts and putting new ends on rods and levers.

A typical job with several operations, that of shaping a truck equalizer bar, illustrates the need for some of the equipment. Bar stock 6x1 in. is taken from the material racks to the punch and shear where it is cut to proper lengths. These go next to a furnace for heating and the center section is drawn to 5x1 in. under a steam hammer operated by compressed air. The ends are left 6 in. wide to provide necessary stock at corners of the curved sections. Next the ends are heated in a furnace and are shaped in a bulldozer. Then the bars are placed on a face plate and the sides are hammered at any points that are not absolutely true. They go next to the blacksmith forges and anvils to be trued up, and then into an annealing furnace. Small fractures are detected readily while the iron is hot but extra precautions are taken with parts that must withstand heavy loads. These are tested by dipping in oil, wiping this off carefully and then painting with whiting the same as was described for testing axles in a previous article on methods in these shops.

The punch and shear was manufactured by the Schatz Manufacturing Company, Poughkeepsie, N. Y. It cuts plates up to 1 in. thickness, shears $1\frac{3}{16}$-in. plates and flat bars, round bars, angles and special sections. Holes are punched up to $1\frac{3}{8}$ in. in plates 1 in. thick.

Furnaces for heating, annealing, case hardening, tempering, etc., form an important part of the equipment for the blacksmith shop. There are nine of these now in use and the shop layout provides for additional ones to meet future needs. Furnaces are provided for serving the hammers, bulldozers, heading, upsetting, and forging machines. Each furnace was selected for its particular service. Some are double-ended, others single-ended. A

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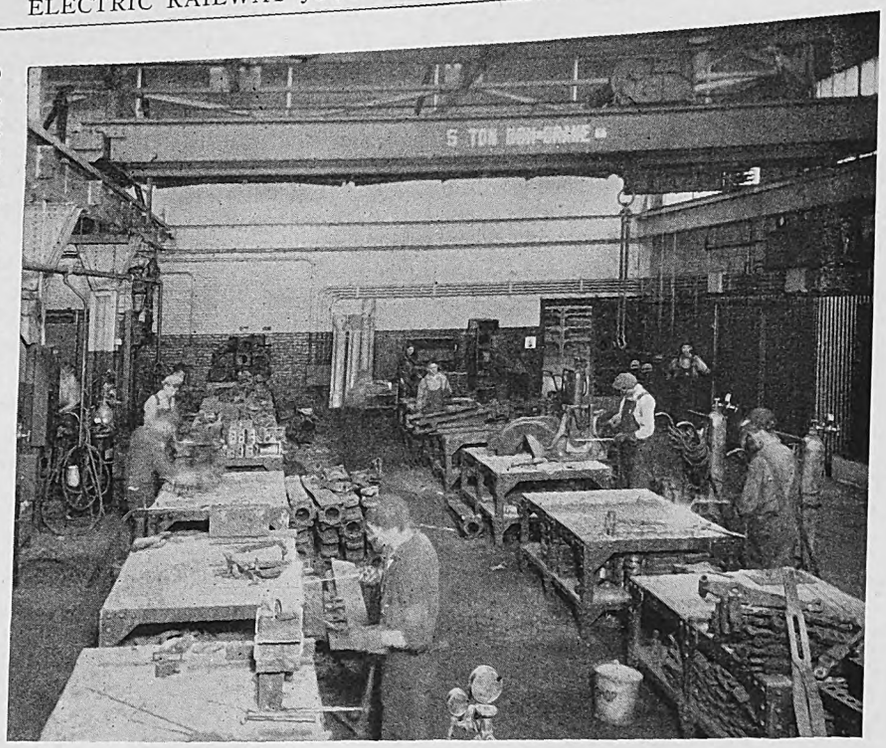
double chamber tool furnace is used to temper the special steels used for high-speed shop tools. Pyrometer equipment for this furnace records the furnace temperatures and insures the right working temperature for each kind of steel. Material can be heated to 3,000 deg. F. if desired. Oil and water quenching tanks are used in this work.

A large annealing furnace is arranged so that material can be placed on cars and be run into and out of it for easy handling. Another furnace 5 ft. by 2 ft. is used for heat-treating various materials. These furnaces are equipped with recording pyrometers to give accurate heat records.

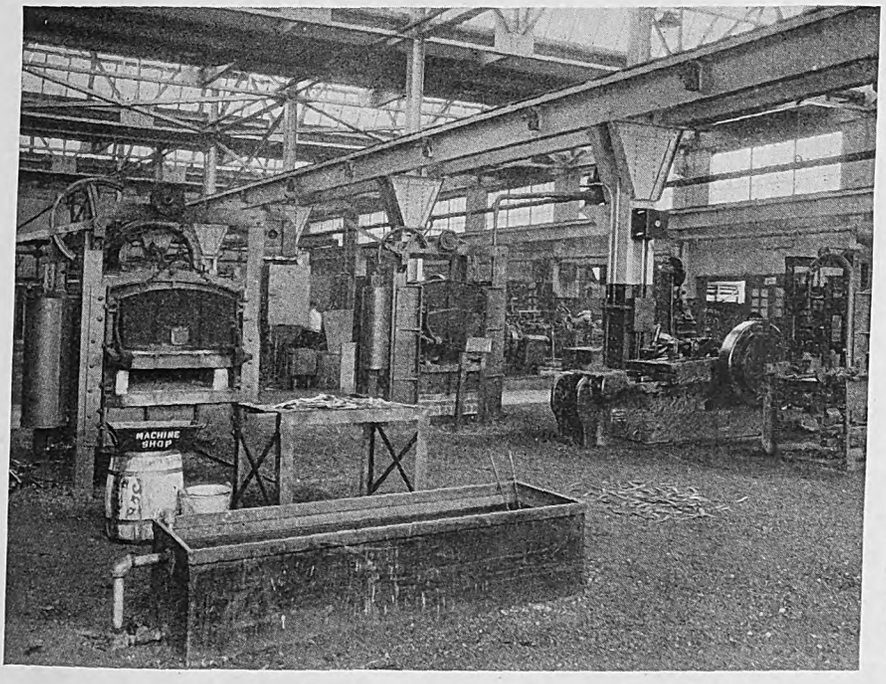
All furnaces were furnished by the Mahr Manufacturing Company, Minneapolis, Minn., and each has its own electrically driven blower. The sizes of the nine furnaces are as follows:

Heat treating furnace	15x24x48 in.
General work furnace	12x24x36 in.
Small bulldozer furnace	12x18x24 in.
Hammer furnace	12x18x24 in.
Case hardening furnace	12x24x60 in.
Bolt forge furnace	12x18x30 in.
Large bulldozer furnace	15x24x72 in.
Tool furnace	12x16x20 in.
Annealing furnace	24x72x96 in.

Fuel oil is burned in all furnaces. It is stored in two 5,300-gal. underground tanks in the yard and from these it is pumped through underground pipes with branches to the burners of each furnace.

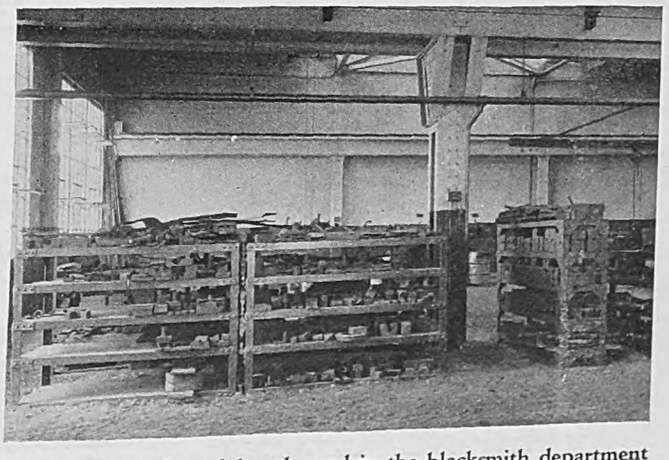


A group of furnaces in the Coney Island shops. The case hardening furnace with tempering trough is shown at the left. A small bulldozer is in the center and a furnace for serving the high speed hammer is at the extreme right



Welding repairs by acetylene are made on brick-topped welding benches. A shelf on the underside of these provides convenient storage space

Bar material for use in the blacksmith shop is stored conveniently just outside the department



Various dies and special tools used in the blacksmith department are stored in racks convenient to the machine tools

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There are twelve Buffalo down-draft forges. Eight of these are 42 in. square and four are 48 in. square. Water boxes, fuel bins and electrically-driven blowers are provided for each. Soft coal is used for fuel but the exhauster draws the smoke away from the fires and leaves the air clear and fresh.

Forgings which are too heavy for hand work are handled by three McDougal-Potter steam hammers. Compressed air at 90 lb. pressure, furnished from the shop air compressors, is used for operating these. Two of the hammers are of 900-lb. capacity and one of 1,200-lb. The hammers rest on timbers supported on concrete foundations, and separate cushioned foundations are provided under the anvil blocks.

Shaping and forming of bars and rods are done with two Ajax bulldozers. One of these is a long-stroke, slow-speed type for bending heavy sections and the other a high-speed, short-stroke and stop-motion type for light work.

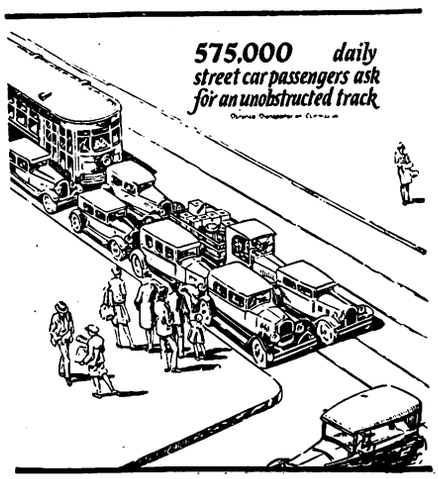
A National forging, heading and upsetting machine is used for making all kinds of special bolts and forming the heads on special rods. It handles work up to 1½ in. diameter. This machine is equipped with dies to forge bolts and rivets of various lengths and sizes. The operator feeds a hot bar into the machine and at each push of the pedal a complete part drops into the pit.

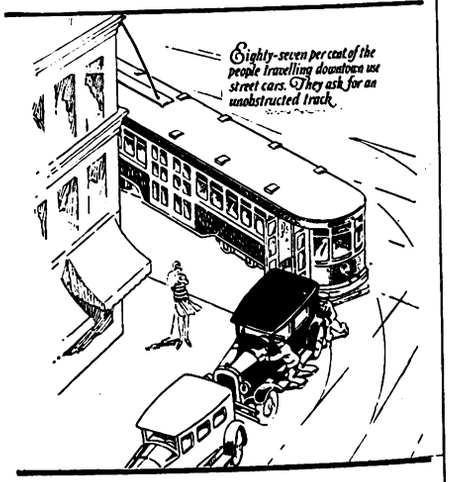
Both electric and gas welding have wide applications in the repair work done in the blacksmith shop. There are twelve brick-topped tables for gas welding and five welding rooms are used for electric welding. Two of these rooms are 6x10 ft. and three rooms are 6x7 ft. Each room has a welding bench and a stool for the workman. Above the bench at one end are the resistors and control of the welding current is by switches within easy reach of the operator. The front of each room has a sliding door, so that other workmen are protected from the glare of of the electric arc. Special receptacles are provided to plug in cables for supplying the welding current. Work is done outside the booths by using long leads and lines run to other departments so leads can be plugged in and welding repairs made there.

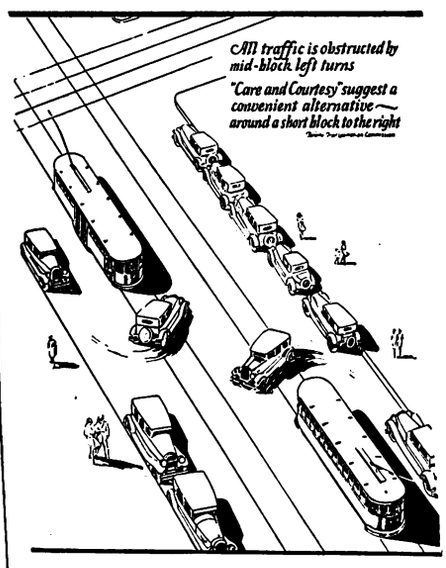
Equipment is handled to the hammers and forges by four jib cranes and a 5-ton, floor-controlled, electric traveling crane operates over the welding benches.

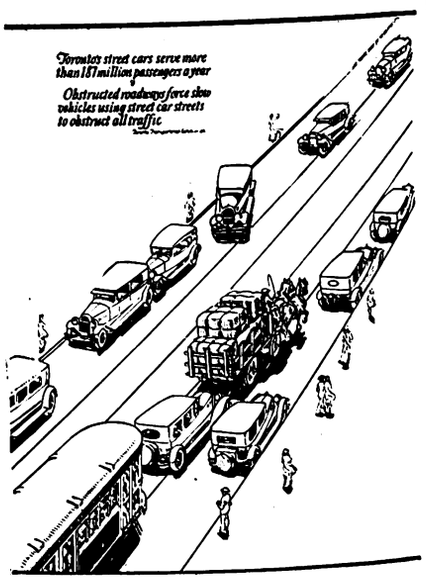
Toronto Campaigns for Clear Car Tracks

PLEADING for an unobstructed track, the Toronto Transportation Commission, Toronto, Ont., has published a series of pictorial advertisements in the local papers. Since the series of advertisements was in the nature of an appeal from the car riders to the drivers of vehicles and others concerned, the name of the commission was not featured.









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Electric Railway Journal Maintenance Data Sheet

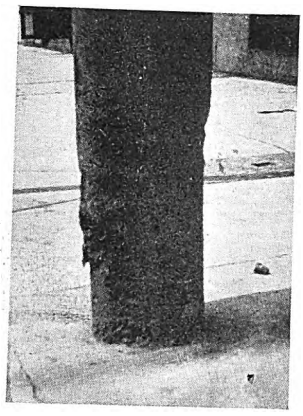
LINE DEPARTMENT—8

Reinforcing Steel Poles*

By H. G. Engelhardt
Engineer Railway Overhead Line Department
New Orleans Public Service, Inc., New Orleans, La.

CORROSION that will render a steel pole unfit for a particular class of service is hard to determine A local study is needed to determine the time when a corroded pole should be renewed, and the characteristics of loading of the particular pole must be taken into account. As a precautionary measure, the New Orleans Public Service, Inc., has adopted a very simple and inexpensive method of reinforcing steel poles.

Before setting the pole, a piece of worn T-rail 9 ft. long is inserted in the butt section. A wooden plug is driven into the butt and the pole is set 6 ft. deep, in the usual manner.



Reinforced steel pole which has corroded entirely away at the base and still keeps in alignment

After setting, a very wet 1 : 3 : 5 mix of cement, sand and gravel, sufficient to surround and cover the rail completely, is poured into the pole from the top. This method of reinforcing can also be used on existing poles by dropping the rail through the top.

Reinforcing in this manner will eliminate any danger of a pole breaking off and falling. If the strain and the corrosion at the base of the pole are sufficient to cause a failure, the rail will bend but not break. A pole thus deflected is detected easily and can be replaced with very little trouble and without great expense.

**Submitted in* Electric Railway Journal *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—32

Keeping Moisture Out of Track Switch Coils*

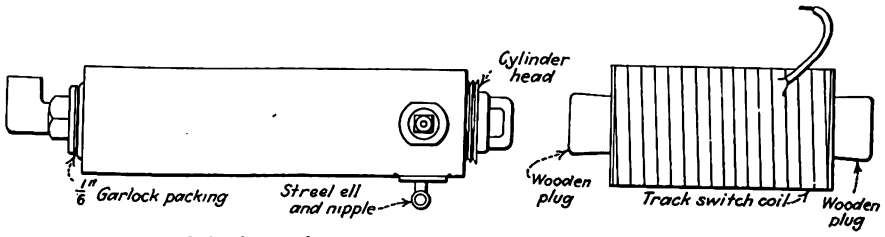
By Charles Herms
General Foreman San Diego Electric Railway,
San Diego, Cal.

CONSIDERABLE trouble was experienced from magnet coils of Cheatham electric track switches on the lines of the San Diego Electric Railway becoming short circuited and burnt out due to moisture getting into the switch cylinder. Various tests and methods were tried for keeping the moisture out and finally the following one was adopted.

Coils are dipped and baked. Westinghouse No. 335 varnish is used. To keep the varnish out of the coil core, a tapered wooden plug is slipped on to each end. The brass nut is sealed on the plunger by use of Garlock packing.

The conduit connection on the side of the cylinder was a frequent source of trouble. This was filled with General Electric Company's No. 227 sealing compound. This makes a perfect seal, which remains intact in all weathers. The compound will not run in hot weather, or crack when cold. Coil failures have been reduced 70 per cent since this method of treating the various parts was started and delays to service are avoided.

The accompanying sketch shows a cylinder and operating magnet coil for a Cheatham electric track switch as developed on the property.



Cylinder and operating coil for electric track switch

**Submitted in* Electric Railway Journal *Prize Contest.*

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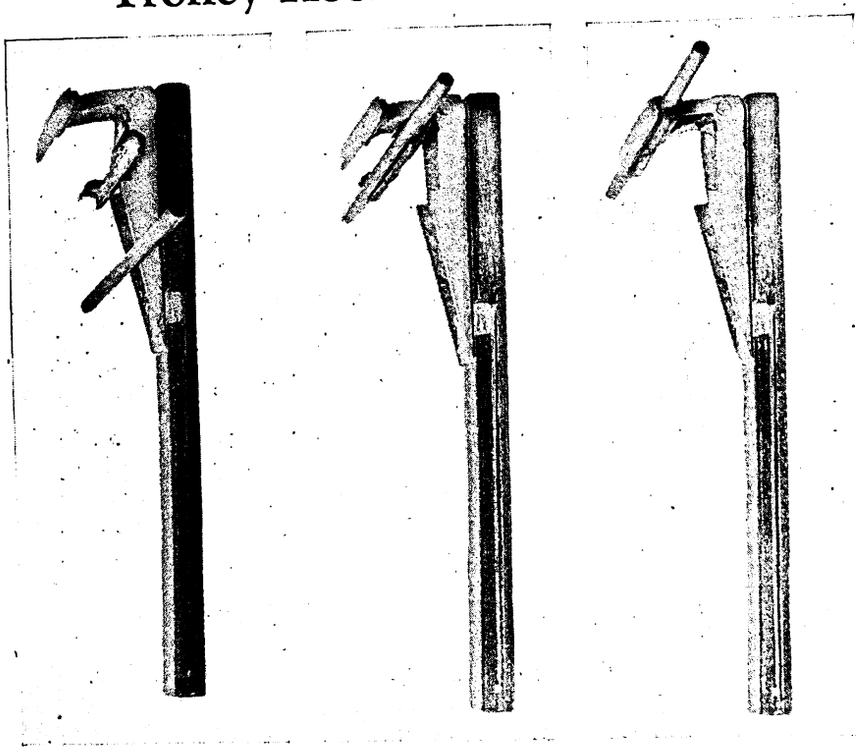
Electric Railway Journal Maintenance Data Sheet

LINE DEPARTMENT—9

Trolley Hook Connector for Portable Equipment*



By GEORGE E. MCEWEN
Electrician Way Department
Toronto Transportation Commission,
Toronto, Canada

A TROLLEY hook connector which allows uninterrupted passage of trolley wheels and which can be applied readily at any point on the wire is used on the lines of the Toronto Transportation System, Toronto, Canada. As shown in the accompanying illustration, the guide on the hook is drawn down over the trolley wire so that it enters a locking lever. A further pull brings the hook into operating position. The wooden pole is then drawn over to the side of the roadway and tied up high enough to clear vehicular traffic.

The hook is cast in bronze and is fashioned so that direct contact is made through the body of the casting and not by way of the locking lever joint.

At left—Trolley hook being applied to wire. Guide placed over trolley wire. In center—Hook drawn down over the wire so that it enters the locking lever. At right—Trolley wire clamped in locking lever

**Submitted in* ELECTRIC RAILWAY JOURNAL *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

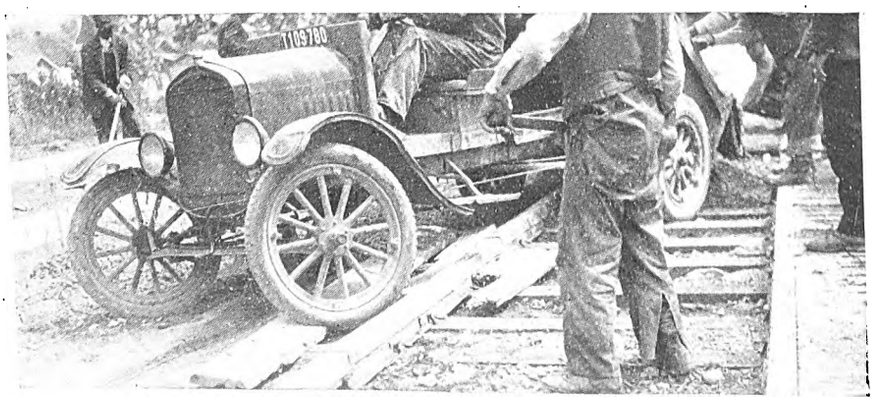
TRACK AND WAY DEPARTMENT—33

Protecting Rail Filler*

By D. H. WALKER
Chief Engineer Terre Haute,
Indianapolis & Eastern Traction Company;
Indianapolis, Ind.

IN SEVERAL locations streets occupied by tracks of the Terre Haute, Indianapolis & Eastern Traction Company have been paved by the city or county from curb to curb, including the track area. In such cases the railway track is prepared to receive the paving laid by the contractor. Usually this pavement is a monolithic concrete slab and rail filler is used to protect the paving.

Guards over rails prevent the trucks from knocking out or breaking down the filler



Concrete is placed directly from the paver bucket to the track area

While the concrete is being poured it is essential to maintain the rail filler tightly against the rail and to prevent the concrete from forcing its way between the filler and the head of the rail.

A small sheet metal guard is applied over the rails. This is made in U shape to fit over the head of the rail and extends down far enough on either side to prevent entrance of material between rail and filler. The guards are about 8 to 12 ft. long of No. 20 gage metal and easy to handle.

**Submitted in* ELECTRIC RAILWAY JOURNAL *Prize Contest.*

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Electric Railway Journal Maintenance Data Sheet

POWER AND ELECTRICAL DEPARTMENT—5

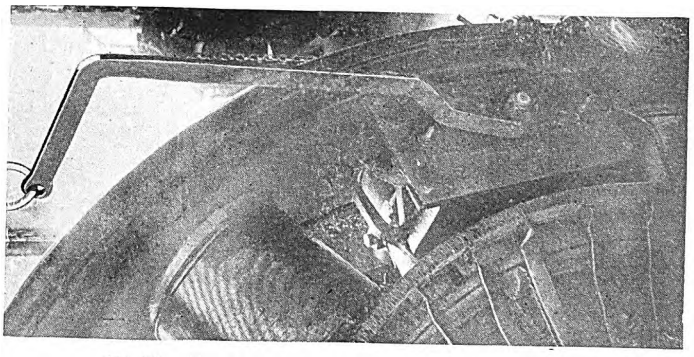
Field Coil Changing Device*

By H. Kowin

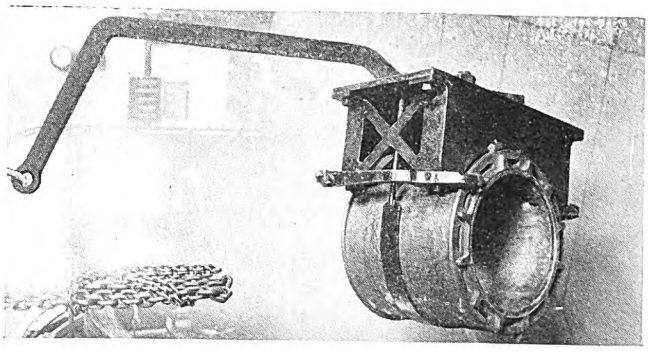
Electrical Department Toronto Transportation Commission, Toronto, Canada

When changing defective field coils on a rotary converter difficulties arise owing to the confined space and the awkward angles at which they have to be taken out and replaced. The electrical department of the Toronto Transportation Commission has developed a device by means of which much time and labor may be saved.

This device consists of a clamp which fits around the coil and which is fastened by means of one heavy bolt to a hook-shaped bar. This enables the coil to be suspended at a point immediately above its center of gravity. The coil may then be slid out at the proper angle, and when a new coil has been placed in the clamp it is at exactly the correct angle to be slid back into place. The pole piece, during the changing of the coil, is held in its place by two adjustable dogs which are fastened to the clamp. This device enables a field coil to be changed in about one-half hour, where previously at least three to four hours were required for the operation.



Field coil in place with testing device attached



Method of suspending field coil by clamping arrangement

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

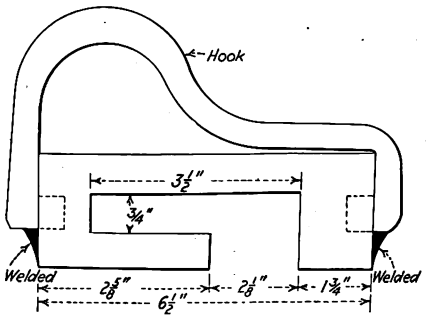
ROLLING STOCK—TRUCKS—28

Handy Attachment for Lifting Truck Frames*

By H. J. Beadle

Engineer of Equipment Dallas Railway & Terminal Company, Dallas, Tex.

For some time the truck foreman of the Dallas Railway & Terminal Company, Dallas, Tex., was confronted with the problem of doing away with the old-fashioned method of lifting truck frames by use of a chain sling, or hook, around the end angle frame of the truck. Often in putting a hook or chain over the end frame angle a sand pipe would be broken or bent. The difficulty was solved by use of the attachment shown in the accompanying illustration. A $2\frac{3}{8}$-in. steel bar is slotted and drilled with a $\frac{3}{4}$-in. hole at each end. A hook was forged and welded to the $6\frac{1}{2}$-in. bar. When this is attached to the truck frame, all the weight of the truck comes at the end of the device, due to its shape. It cocks to such an extent as to prevent slippage and so makes it safe and dependable. The tool slips over the end frame angle piece on the motor or trailer end of the truck, and the air hoist with its hook in the device does the lifting.



Handy attachment for lifting truck frame

*Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

POWER AND ELECTRICAL DEPARTMENT—6

Pilot Lamps on Tie Feeders in Substations*

By C. R. Norton

Electrical Department Toronto Transportation Commission, Toronto, Canada

PLACING of pilot lamps on all the d.c. tie feeders in each substation of the Toronto Transportation Commission has proved of distinct advantage during partial or complete interruptions on the system. The lamp is connected between the tie feeder and ground outside of both the knife switch and circuit breaker. Should the bus in any station become dead due to interruption of that station, the operator can tell immediately which stations are alive and by which tie feeders he may proceed to make his own bus alive, if necessary.

In the event that there is a total interruption to the system, the first station to get back in on load is indicated by the lighted pilot lamps in the other stations. It is often of great help to a station which is experiencing difficulty in getting a machine to build up after an interruption to know that its bus can be made alive from a tie feeder and used for excitation.

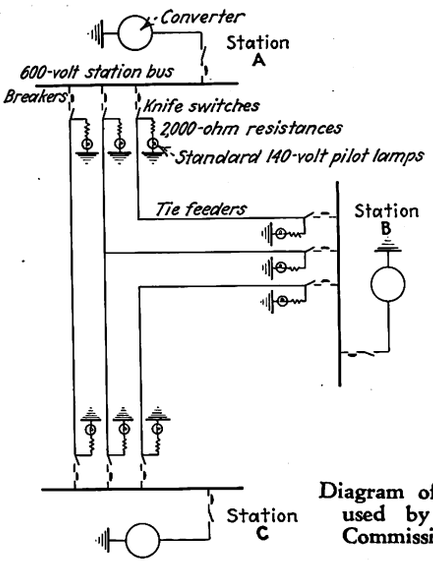


Diagram of pilot lights on tie feeders as used by the Toronto Transportation Commission

Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—29

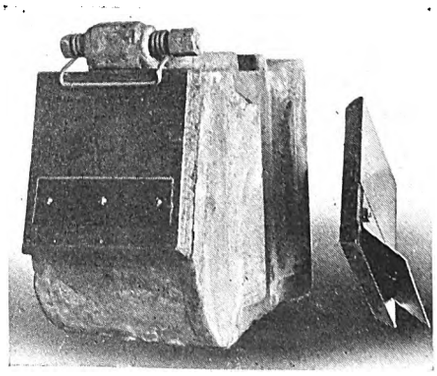
Wooden Journal Box Covers*

By Julian M. Scott

Assistant Superintendent of Rolling Stock Montreal Tramways, Montreal, Canada

MAINTAINING journal box covers in good condition has always been one of the smaller, but constant problems to be taken care of by every electric railway. An important consideration is to keep the packing in good condition and to eliminate noise due to rattling while the car is in motion.

For renewals on old type boxes, a cover of the type shown in the accompanying illustration is used. This is made of maple and has a reinforcement strip outside and a tapering spring strip inside. The action of the sturdy spiral spring forces the cover inward and downward. Jolting assists in this, so that a very satisfactory joint is maintained. The cover is light and is held securely from destructive vibration. The holding bolt cannot rattle as it is a fulcrum between the inner and outer ends of the spring.



Type of wooden cover used for journal boxes on cars of the Montreal Tramways

Submitted in Electric Railway Journal Prize Contest.

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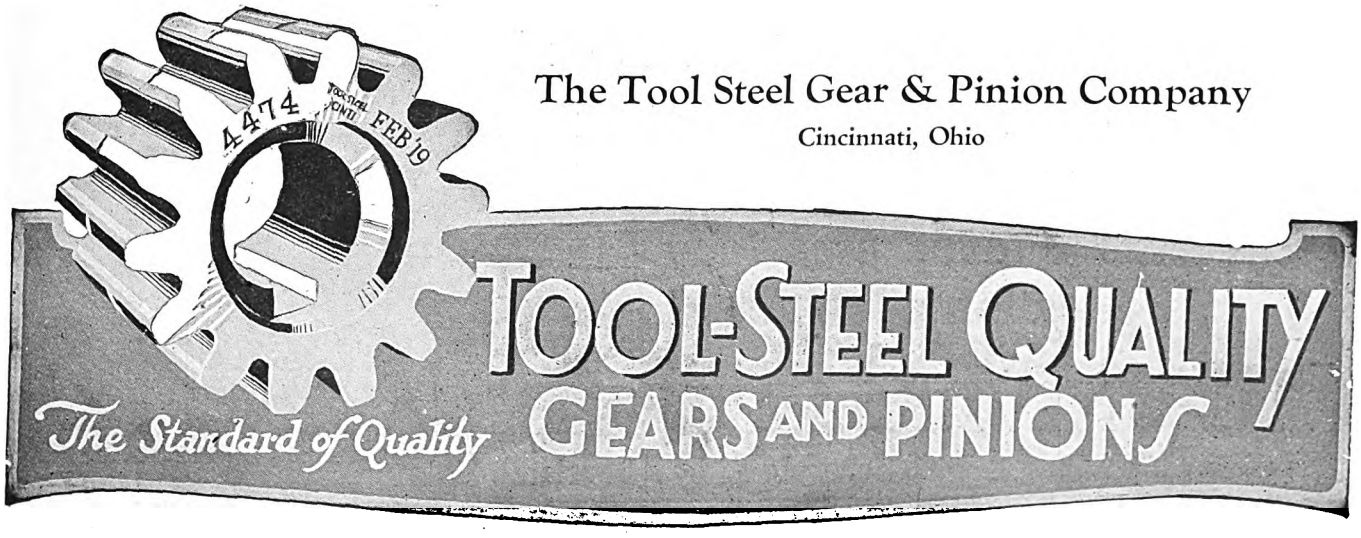
POURING SILENCE

POURING SILENCE
Machinists William Pitt (left) and Manuel Lawrence, pouring in the thin stream of lead which makes gears quiet.

After thoroughly testing "Tool Steel" QUIET GEARS and profiting by our experience in this direction, the Market Street Railway, San Francisco, Calif., show the accompanying photo in their house organ, "Inside Track."

Evidently they discovered, from actual tests, that "Tool Steel" QUIET GEARS are really quiet and worthy of publicity.

Specify "Tool Steel" QUIET GEARS *the next time you buy—either replacements or new equipment—*



The Tool Steel Gear & Pinion Company
Cincinnati, Ohio

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OVEN DETAILS ARE IMPORTANT

From years of constant contact with the design, manufacture and operation of industrial ovens, our experience indicates that low cost oven operation is seldom the result of any spectacular design features, but rather the rational application of a host of engineering fundamentals—it is the careful co-ordination of all the seemingly negligible factors in oven practice that makes the big difference in fuel and labor costs after the installation is put in commission.

It may further be said from an engineering standpoint that knowing what not to do in oven practice is fully as important as knowing what may be done.

Oven building is a specialty that calls for a maximum of experience and engineering judgment.

Because of the high degree of specialization required, it has usually proven more desirable for the oven user to delegate to an organization of experienced oven engineers the entire layout and installation of all the elements that go to make up the baking department. In doing so he relieves his own engineering department of an unfamiliar task and at the same time is assured that the completed department will meet his specifications both as to quality of production and economy of operation.

Young Brothers Company has a significant record of accomplishment in this type of service, as well as in the field of individual oven design and installation.

YOUNG BROTHERS COMPANY
6520 MACK AVENUE, DETROIT, MICHIGAN

DISTRICT SALES OFFICES
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1424 Guarantee Title Bldg., Cleveland
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20 E. Jackson Blvd. - - - Chicago
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Hiram Walker & Sons, Metal Products Limited, Walkerville, Ont.

OVENS FOR
Core and mold baking — Low temperature heat treating — Drying — Japanning and Enameling — Electrical appliance baking — Adapted to all methods of heating.

YOUNG BROS. CO. OVENS OUR BOLTLESS JOINT DETROIT

INDUSTRIAL OVENS

A STANDARDIZED LUBRICANT

TULC A LUBRICANT

TULC is used by many Electric Railway properties as standard lubricant

TULC will eliminate many lubricating problems

TULC will prolong the life of bearings

TULC will show a reduction in power consumption

TULC is made especially for the lubrication of rolling stock.

THE UNIVERSAL LUBRICATING CO.

1400 Schofield Bldg., Cleveland, Ohio

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Electric Railway Journal Maintenance Data Sheet.

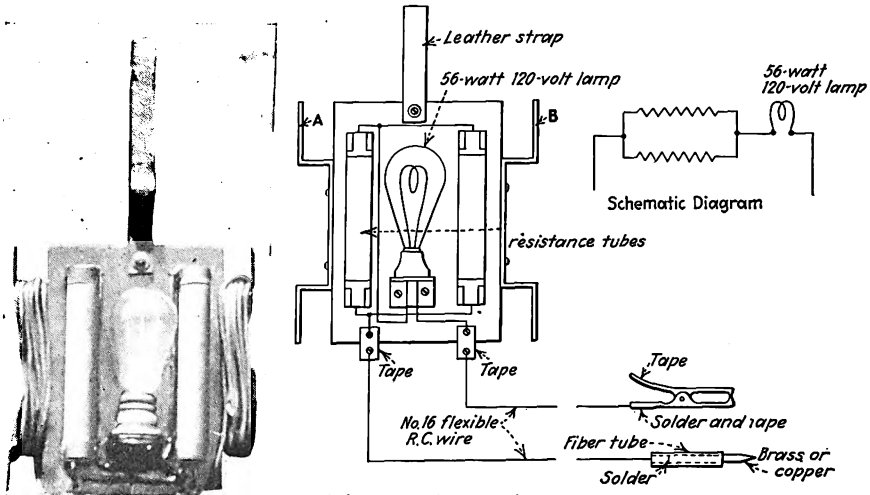
ROLLING STOCK—ELECTRICAL—54

Convenient Lighting-Out Test Block*

By Arthur E. Clegg
Foreman Electrical Department San Diego Electric Railway, San Diego, Cal.

TESTING of electrical circuits and apparatus for short circuits and grounds is done conveniently by a lamp test block in the electrical department of the San Diego Electric Railway. Accompanying illustrations show the construction.

A 56-watt 120-volt lamp, together with two 22,000-ohm resistance tubes, is mounted on a block. The bottom is fitted with terminals for the leads, and the top has a leather strap to be used when the equipment is hung up. One lead has a test clip and the other a copper contact with a fiber handle, this latter being used for the testing. Side pieces designated as *A* and *B* in the accompanying sketch are used to wind up the leads so as to make the apparatus convenient for carrying.



At left, general view of lamp testing equipment. At right, details of construction of lamp tester used by San Diego Electric Railway

**Submitted in* Electric Railway Journal *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

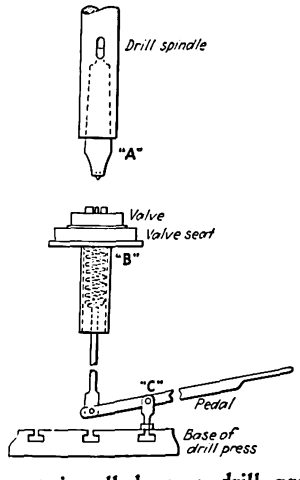
ROLLING STOCK—MISCELLANEOUS—38

Drill Press Attachment for Grinding Rotary Brake Valves*

By E. C. Kelley
Shop Foreman Virginia Public Service Company, Hampton, Va.

GRINDING rotary brake valves by hand is tedious and expensive. Modern valve-grinding machines have improved matters, but in small shops where there is but a limited amount of this work a simple grinding device can be attached to a drill press. The accompanying sketch shows the equipment as used in the shops of the Virginia Public Service Company, Hampton, Va., which has given very satisfactory results.

The upper portion of the grinding tool may have a Morse taper shank or it can be held in a drill chuck. The lower portion is shaped like the bottom of the valve stem with the addition of a conical boss in the center to permit the valve to adjust itself to the seat and provide for equalization of the pressure on its face.



Equipment installed on a drill press for grinding rotary brake valves

The table to support the valve seat consists of a flat plate with a short piece of pipe attached. This forms a spring box and guide. The spring gives uniform pressure and flexibility to compensate for any inaccuracy in setting up. A pedal lever and connecting rod are used for raising the work into position. The fulcrum is attached to the base of the drill press and the connecting rod is aligned to the center of the drill spindle just above it.

When grinding a valve the operator depresses the pedal, which raises the work into position. The valve is rotated from the drill as the operator moves the valve seat in a circle. An average of from five to seven minutes is required to grind a valve unless it is very badly worn.

**Submitted in* Electric Railway Journal *Prize Contest.*

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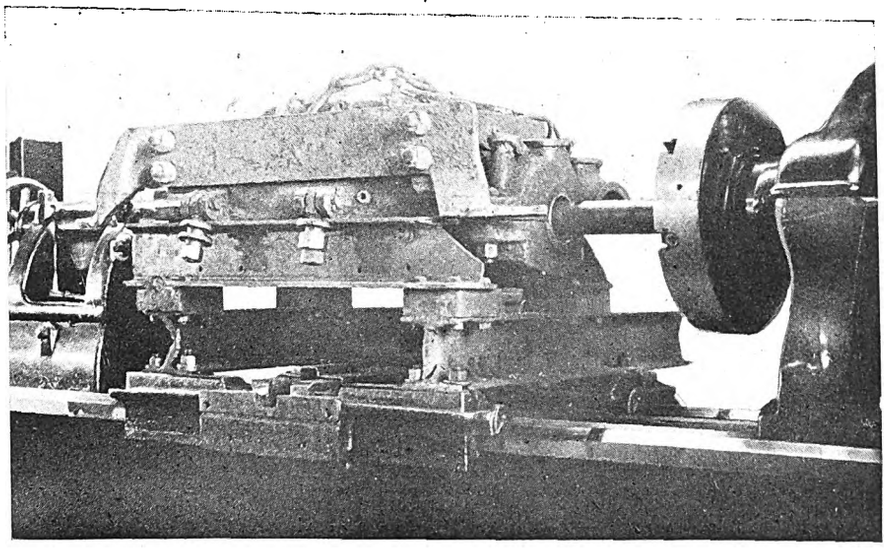
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—55

Boring of Motors Increases Bearing Life*

By C. B. Hall
Chief Clerk Mechanical Department Virginia Electric & Power Company, Norfolk, Va.

EXCESSIVE wear on bearings, the resulting noise, brought about a gears and pinions, together with grave situation on the lines of the Virginia Electric & Power Company, Norfolk, Va. Study of the problem showed that reboring of the motors operated by the company was desirable as, in some instances, on the GE-210 motors there was from $\frac{1}{8}$ in. to $\frac{3}{16}$ in. play, and on the GE-87 motors as much as $\frac{5}{16}$ in. play.



GE-87 motor in position for reboring in the Norfolk shops of the Virginia Electric & Power Company

At first the work of reboring was awarded to an outside machine shop under contract, $20 per motor being paid. Later, a new lathe arranged for the reboring was purchased by the company, so that the remaining work was carried out at a cost of approximately $2.75 per motor.

The reboring solves the difficulty in excessive wear of bearings so that now the service obtained has been increased from three months to three years. Decreased wear has also resulted on gears and pinions, and the noisy condition has been overcome.

**Submitted in* Electric Railway Journal *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

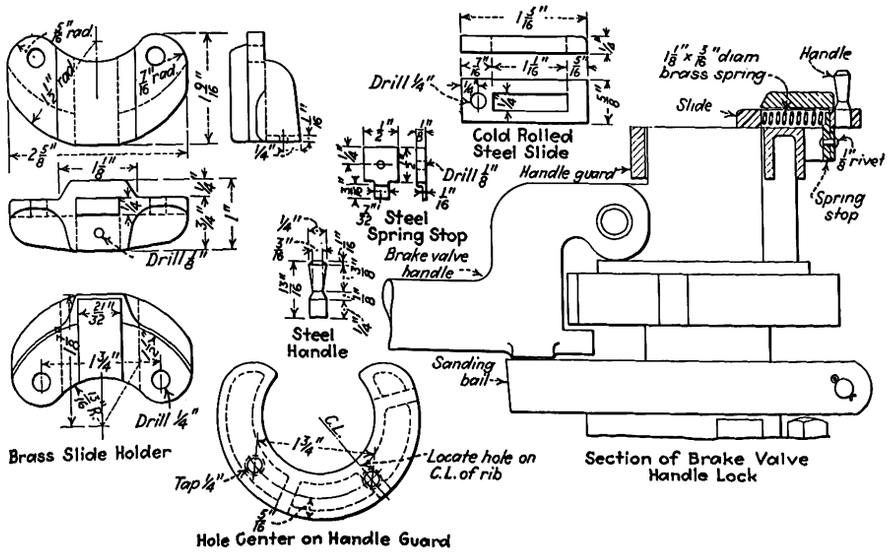
ROLLING STOCK—MISCELLANEOUS—39

Making Sanding Easier*

By W. H. McAloney
Superintendent of Equipment
Georgia Power Company, Atlanta, Ga.

WHEN the brakes were set with the M-28 brake valves with sanding features, continuous difficulty was experienced in sanding the rail on lines operated by the Georgia Power Company. This was due to the handle socket for the brake valve hitting against the handle guard, and the handle body rubbing against the latch cam. To overcome this difficulty, a lock was devised to prevent any excess vertical motion of the handle socket.

The lock consists essentially of a slide which extends partially over the top of a handle socket, the slide guide, which is fastened to the top of the handle guard, and a spring to hold the slide in position as shown in the accompanying illustration. By pushing the slide forward, the brake handle can be put on or removed easily. This device has proved very satisfactory. Details were worked out by J. H. Squires, machine shop foreman of the company.



Brake valve handle lock

**Submitted in* Electric Railway Journal *Prize Contest.*

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Prize Winner for July Is E. C. Kelly

Shop foreman of Virginia Public Service Company gets $25 monthly prize for July in *Electric Railway Journal's* maintenance contest for his description of a truck for handling car wheels and axles. H. S. Williams of Detroit receives honorable mention for adjustable pit light

SOME simple, durable, light conveyance for handling the heavy wheels and axles used by street cars is a desirable adjunct to any electric railway shop. A two-wheeled truck arranged for handling such material is used by the Virginia Public Service Company of Hampton, Va. A description of this by E. C. Kelly, shop foreman, was awarded the $25 monthly prize for July, by the judges in ELECTRIC RAILWAY JOURNAL'S maintenance contest. The common method of rolling the car wheels is interesting to watch when performed by a skilled operator. But accidents sometimes occur and it requires a considerable knack to be able to handle wheels efficiently in this manner. The truck for handling car wheels and axles, as used in the shop of the Virginia Public Service Company, requires no particular skill from the workman, and wheels and axles can be handled quickly by one man.

An adjustable pit light, as described by H. S. Williams, assistant superintendent of equipment Department of Street Railways, Detroit, Mich., was awarded honorable mention by the judges. This is a simple contrivance but one which fills an urgent need.

Although the time for submitting items eligible for the $25 monthly prize expired at midnight on July 31, the JOURNAL will continue to pay $5 each for maintenance ideas submitted and accepted for publication. In addition to the July prize which was awarded to Mr. Kelly, the judges will be asked to select the best of the items published in this issue and in the other issues of the JOURNAL since the July maintenance number. The material was all submitted before July 31, and therefore an additional award of $25 will be made and announced in September.

PAYMENT FOR ITEMS CONTINUES

There is still on hand a considerable number of items submitted in the contest, most of which are, nevertheless, first-class maintenance ideas that offer valuable suggestions for application in the shop, track or electrical departments. These will be published as fast as space permits, and the author of each item will be entitled to the regular payment of $5 per item.

The maintenance contest has shown what a wealth of ideas are available in the industry. It has also served to impress upon maintenance men themselves the value of establishing the habit of interchanging their own practices with other properties throughout the country, through publication in the pages of the JOURNAL. Although the contest has brought to light many "shop kinks" that were ingenious and new to most of the industry, there is still a great wealth of this material that remains unpublished because the man responsible for the idea has never thought it worth while to send it to the JOURNAL.

It is therefore to be hoped that the habit established by many maintenance men through this contest will be continued. Many new devices and methods are being developed every day. Send these to the JOURNAL. It is a good plan for department heads to discuss this subject with the foremen, either individually or at staff meetings. Take a photograph or make a sketch illustrating the construction and operation of the device or the method of carrying out an unusual maintenance operation. Write a letter telling about it. This can be in long hand if a typist is not handy. Sketches may be in pencil or blueprints. They do not need to be finished drawings. All that is necessary is that they illustrate clearly the construction or operation of the device. Mail your material to ELECTRIC RAILWAY JOURNAL, Tenth Avenue and 36th Street, New York City, and the JOURNAL editors will do the rest.

E. C. Kelly

Edgar C. Kelly, who is awarded the monthly maintenance prize of $25 for July, is at present shop foreman of the Virginia Public Service Company at Hampton, Va. He is a veteran of railway work, with some 30 years of practical experience on several properties.

Previous to his present position with the Virginia Public Service Company, Mr. Kelly was master mechanic of the Chester, Kennett & Wilmington Railway & Electric Company. Before that he occupied the same position with the Hampton Roads Traction Company. His first connection with the Virginia Public Service Company was in the position of head electrician and pit foreman in the company's car shops.

Mr. Kelly takes a keen interest in the improvement of electric railway practice and in group activity for bringing about greater teamwork among the men of several departments. Some ten years ago he served several terms as chairman of Company Section No. 10 on his property. He is a native of Huntingdon, Pa. After obtaining a public school education he took a course of study at the Coast Artillery School, Fortress Monroe, Va.

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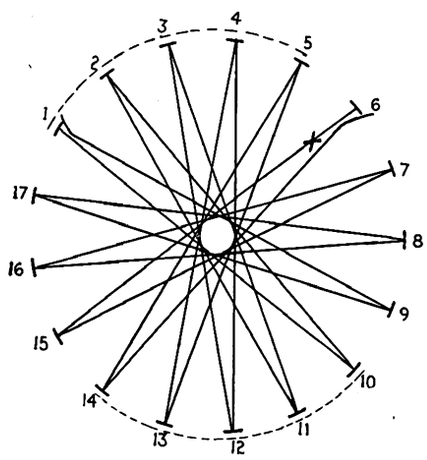
PRACTICAL HELPS *for the* Armature

Elimination Method of Locating a Ground

ONE method of locating a ground on a four-pole, series-connected armature, is to eliminate the coils that are not grounded by subdividing the armature coil in sections and testing each section with a lamp circuit. The entire winding is first divided into two insulated sections, and the section containing the fault determined with a lamp circuit. This section is subdivided into two insulated sections and another test is made. The subdividing is continued until the possible field of fault is reduced to a single coil connected at one end to a single bar.



Connections for a four-pole, series-wound armature

The winding is separated into insulated sections by lifting top leads from the commutator at the specified points. On a multiple-connected armature the lifting of two diametrically opposite leads will divide the winding into equal, insulated, halves. On a series-connected armature, however, the two leads to be lifted first are approximately on the quarter.

The accompanying diagram shows, conventionally, the connection of a four-pole, series-connected armature as used in railway motors. Assume that a ground exists at X and it is desired to locate the faulty bar or coil. Lifting any two top leads that lie on the quarter, the top leads of bars 1 and 6, for example, divides the winding into two sections. One of these sections includes bars 1, 10, 2, 11, 3, 12, 4, 13, 5, 14 and their dependent coils. The other section includes bars 9, 17, 8, 16, 7, 15, 6, and their dependent coils. All bars of the first or faulty section, as indicated by the broken line outside of the bars in the illustration, are marked with a chalk line, and are to be ignored in subsequent tests. Lifting the top lead from bar 16, the faulty section is divided into two subsections, one of which includes bars 8, 17 and 9, and the other of which includes bars 16, 7, 15 and 6. On testing, the latter group is found to contain the fault. The remaining top leads are now lifted and the field is finally limited to bar 6 and a bottom lead. Lifting this bottom lead and testing it and bar 6 determines the coil of that lead as the one containing the fault.

Locating Short-Circuits by the Bar-to-Bar Test

IN A bar-to-bar test for short circuits and open circuits, current is passed through the armature by means of spring contacts that touch the commutator on the quarter, 90 deg. apart, just as the brushes do when the armature is in operation. With current flowing, test points from a voltmeter are touched successively to all parts of adjacent bars, the armature being turned through 360 deg. in the course of the test.

In the accompanying conventional diagrams, one of the paths through an armature is represented. The diagonal lines represent the armature coils, while the short horizontal lines represent the commutator bars. The bars numbered 1, 2, 3, 4 and 5 are diametrically opposite from the corresponding bars, lettered a, b, c, d and e. As may be seen, it is necessary in passing from any bar to an adjacent bar, to pass through two coils in series.

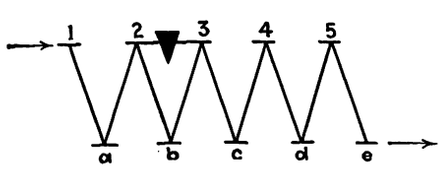


Fig. 1—Short-circuit between commutator bars

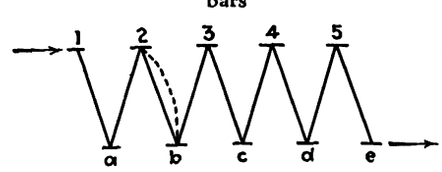


Fig. 2—Short-circuit in one of the coils

In conducting the test, if all coils are alike and the commutator has no defects, all deflections will be the same as the test progresses around the commutator. However, with a dead short between two bars, as indicated between bars 2 and 3 in Fig. 1, a zero reading will result when the voltmeter is connected to bars 2 and 3. With a partial short between the two bars, a deflection less than normal will be obtained.

If a coil is shorted, as indicated in Fig. 2, a deflection less than normal will result when the voltmeter test points are touched to bars 2 and 3 and also to the bars a and b on the opposite side of the commutator.

Two Armature Paths Are Same Length

CONTRARY to the belief of many electrical repair men, the two electrical paths in a two-circuit or series-wound armature are of the same length, even when the brushes are set at the quarter, or 90 deg. apart. Since the mechanical distance between the brushes, when they are set at the quarter, is in the ratio of three to one, measuring around the bottom of the commutator and around the top of it, many believe that the paths are in the ratio of three to one.

In the accompanying diagram a conventional series-connected, four-pole armature having fifteen coils and fifteen commutator bars is shown. The two brushes are shown on the quarter, the usual position. The current, entering at the positive brush and leaving at the negative one,

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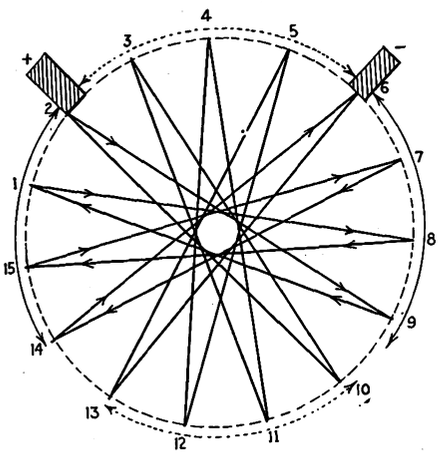
Winder



This diagram of a series-connected, four-pole, armature shows that the two electrical paths are equal, even though the brushes are set at the quarter

divides between two paths which are in parallel. One path, as traced in the illustration by arrowheads, includes bars, 2, 9, 1, 8, 15, 7, 14 and 6; the alternate path, not traced, includes bars 2, 10, 3, 11, 4, 12, 5, 13 and 6.

Both paths cross back and forth on the commutator, so that each path includes two quarters of the commutator. The two quarters, however, are diametrically opposite each other, as indicated in the diagram by the double-headed arrows outside of the bars.

Precautions for Testing With Lamp Circuits

TESTING armatures with a lamp testing circuit is a simple procedure but wrong results may be obtained unknown to the tester, if he is unaware of the possibilities of error. There are several precautions, therefore, that he must observe to avoid these errors.

To illustrate how incorrect results can be obtained, consider an armature resting upon an iron truck, which in turn is resting upon an iron floor. It is very likely that any iron floor, such as the floor of an electric oven, would be grounded to the track rail. With a circuit established through the truck and floor, the lamp circuit test would consist simply in touching test point T, indicated in Fig. 1, to the commutator. A ground between the copper and iron would permit the test current to reach the earth by way of the truck and floor and the test lamp would be fully lighted.

If, however, there should be insulating varnish on the floor or in the truck bearings that support the armature shaft the testing circuit would be interrupted and would indicate that the armature was free of ground faults, even though a fault might exist. To make certain that the shaft of each armature is grounded, the test point should be set to the shaft before attaching it to the commutator.

To minimize the possibility of an error of this kind, sometimes two test lines are provided, as indicated in Fig. 2. The line including the test lamp is connected to the trolley and the other line is connected to a positive ground. The use of two lines, however, introduces another possibility of error. If the workman reverses the leads and touches the line from the trolley to the armature shaft, assuming the trucks to be grounded the lamp will glow and a grounded fault will be indicated although none may exist. The precaution to be taken here is to touch both test points, one after the other, to the armature shaft. If the lamps do not

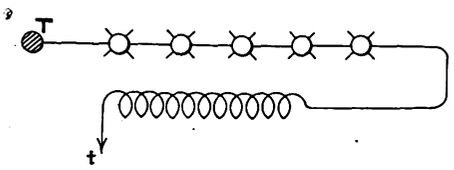


Fig. 1—Method of connecting single test circuit

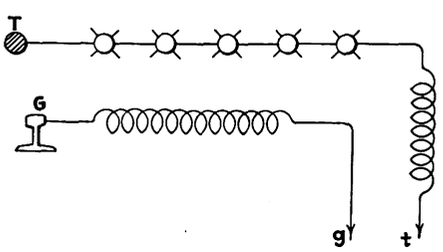


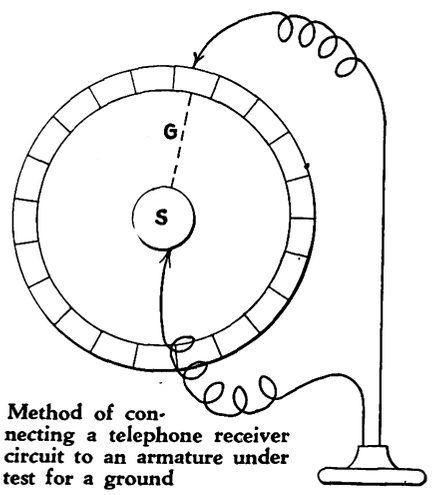
Fig. 2—Connections for two test circuits

light in either case the truck is not grounded. If they are lighted by one test line and not by the other, the one that lights the lamp should be touched to the commutator when making the test for a ground.

Telephone Receiver Test for Locating Grounds

DEAD GROUNDS in four-pole, series-connected armatures can be located approximately by using a telephone receiver test circuit. Although the bar or coil in which the ground is located cannot be determined by this method, the approximate location can be found and the lamp test circuit used to determine the exact location. This method frequently saves much time over testing each individual path of the armature.

In conducting a test, a current of



Method of connecting a telephone receiver circuit to an armature under test for a ground

three or four amp. is sent through the armature by connecting the supply circuit at points 90 deg. apart on the commutator. One end of the receiver circuit is then connected to the armature shaft, indicated as S in the accompanying illustration. Tapping the other end of the circuit on a commutator bar produces a click in the receiver.

Assuming that a ground exists in the armature, the intensity of the click as the contact is moved from bar to bar varies from a loud hammering noise to a barely audible click. The maximum intensity of the click occurs at the farthest point from the ground, while the minimum click occurs at the bar nearest the ground. It is necessary, therefore, to find the bar which produces the least audible click.

With the ground located approximately, the top leads of two diametrically opposite bars in the vicinity of the ground may be raised, and a lamp test circuit used for determining whether or not the ground is in that particular isolated unit. When the faulty unit, composed of a bar and coil, is found, the bottom lead of the unit may be disconnected and the exact location determined.

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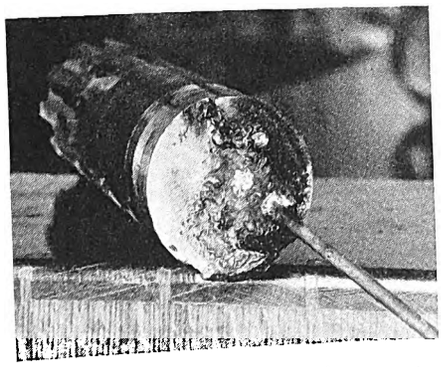
Water Under High Pressure Substituted for Sandblast

EXCELLENT results in cleaning car trucks brought in for overhaul have been obtained by the Market Street Railway, San Francisco, Cal., by the substitution of washing for sandblasting. The outfit consists of a hot-water heater and high-pressure pump. Six pounds of cleaning compound are added to 100 gal. of water, which is heated to 135 deg. and brought by the pump to a pressure of 300 lb. It has been found that the time required to do the work has been reduced by one-third, in addition to which the job is better and the shop is kept cleaner. Small parts of car equipment are cleaned in a large tank in which water is heated by steam to about 180 deg. The sandblast is still used for cleaning rough castings, controller parts and armature cores.

Welding Rod Captures Broken Axle Piece

WHEN the axle of one of the gasoline-electric motor buses of the International Bus Company, a subsidiary of the International Railway, broke in two in Buffalo not long ago the hardness of the metal at the point of the break was so great that the usual methods of drilling the short section of the shaft as a means of withdrawing it could not be used.

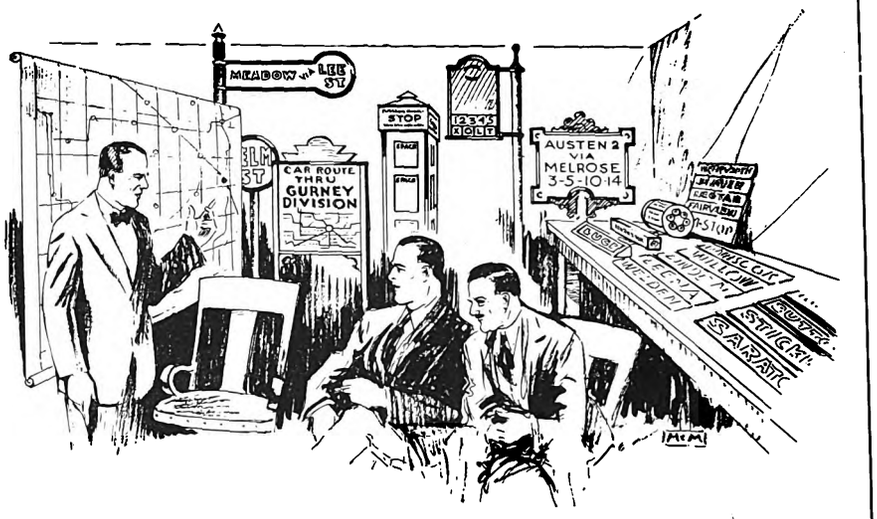


Current furnished by the electric generator of a gasoline-electric motor bus was sufficient to affix a welding rod securely to end of broken axle

The situation was solved ingeniously, however, by grounding one lead of the electric generator to the bus frame and fastening the other lead to a 2-ft. piece of $\frac{3}{8}$-in. welding rod. With the bus motor driving the generator the welding rod was touched to the end of the broken axle section and are welded to the shaft. The leverage afforded by the rod then made it a simple matter to withdraw the short piece of elusive shaft.

Dick Prescott Reports an Experience

and Learns the Reason



WHEN Dick Prescott, superintendent of equipment of the Consolidated Railway & Light Company, and his assistant, Steve White, called at the office of the Grand City Railway, they were received by Mr. Robins, the general manager. Their experience with the street car service in this city had been a pleasant surprise, and since the purpose of their inspection trip was to pick up new ideas for application on their own property, Dick was intent upon finding the causes behind the unusually courteous and accommodating car operator in charge of the car on which they had traveled from the station to the hotel.

As the two visitors entered Mr. Robins' office they could not avoid a hasty glance around the room before explaining the purpose of their visit. It was the strangest looking railway manager's office they had ever seen and resembled a display room in a sign manufacturing plant. On stands, brackets, walls and tables were signs of many varieties and colors.

"Well, gentlemen, I can see that you are impressed by our little sign shop," said Mr. Robins with a smile, voicing the thought in the minds of our two friends.

"This certainly looks very interesting," replied Dick. "We are naturally wondering what it's all about."

"That's very simple to explain; we're trying to make it easy for the public to use our service."

"We were impressed by that fact on our arrival this morning," again replied Dick with enthusiasm. "Those maps you have in your cars are an immense help to a stranger; and the operator we rode with to the hotel was as efficient and accommodating as any street car man I ever met."

"Have any trouble finding out how to reach the hotel by street car?"

"Not a bit."

"Ask anybody how to get there?"

"No, there were signs at the station and on the cars that gave us the information."

"All right, gentlemen, that's what we're trying to do all over this system, and that explains this little sign exhibit that attracted your attention when you came in. All we're trying to do here is to answer questions before they are asked."

"That sounds interesting in its possibilities," remarked Dick. "Does that mean that you try to tell a passenger by signs how to find his way about on your property, so that he doesn't need to ask questions regarding what cars or routes to use in getting to his destination?"

"You've hit it right on the head. We assume that not only strangers in the city, but many of the permanent residents here do not know their way around town on our cars. We constantly try to put ourselves in the position of a prospective car rider, and we try to imagine all the questions that would arise in his mind in making a trip from one point to any other point in town on our system. Then we try to answer those questions by maps, signs, route numbers and stop indicators. We try to tell him where to find the route he should use in reaching his destination."

"Doesn't that run into a lot of money for signs and their maintenance?" queried Dick.

"Yes, that's true, but we consider this the best possible kind of advertising, for in every one of these signs mounted on poles, at street corners and at strategic locations, besides those mounted in the cars themselves, there is a silent invitation to prospective passengers to use our service."

"That certainly sounds convincing," remarked Dick.

"Come over to this map," replied Mr. Robins, "and I'll explain our idea in more detail."

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Association Activities

Detecting High-Accident Men*

By Dr. C. S. Slocombe
Safety Adviser Boston Elevated Railway

ONE advantage in safety work in street railway companies possibly does not obtain so much in industrial plants, namely that every accident, no matter how small or whatever its nature, must be reported; even if it is only that a car scrapes paint off an automobile fender or an automobile scrapes paint off a street car. The more accident reports there are, the more chance there is of accurately finding out causes by statistical analysis and treatment.

The first thing noticed when the situation on the Boston Elevated Railway was investigated was that a certain number of men seemed to have many more accidents than others, even though operating over the same routes and under approximately identical conditions. It seemed that those men with a large number of accidents needed to be dealt with first.

Any occupation may be regarded as hazardous or non-hazardous according to the average number of accidents that occur in it. But whether it is hazardous or not, accidents may be due to two different circumstances. Either there is a small number of employees who have a large number of the accidents and thus boost the average, or the accidents may be spread pretty evenly, none seeming to have many more than the others.

In the second instance the conditions of work would be regarded as particularly hazardous. Safety work then should be devoted to improving the lighting or ventilation, putting up guards, organizing committees, etc.—generally using means which will affect the whole group more or less the same way. Both of these conditions may occur together, as they seem to in the street railway business. That is to say, there are a large number of accidents due first to the large number of automobiles, narrow, crowded streets and operating conditions affecting all men, and second, the large number is due to a small number of high-accident men.

It is quite possible to find out statistically without any detailed examination of records whether there is present in any group of workers a proportion who are accident-prone. The only two figures that need be known are (1) the per cent who had no accidents during a period and (2) the average number of accidents per employee. Curves based on the work of English statisticians are then used for the purpose of telling whether there are accident-prone men in a group.

Assuming that these conditions exist, that is, that there are high-accident men and others with a general medium average, the employees can be split into two groups: 75 per cent having a comparatively low number each, say averaging three, and 25 per cent having a high number of accidents each, say averaging eight. The percentages might, of course, be 80 and 20 or 67 and 33, according to where the dividing line is put.

In what way are we to deal with accidents? Which group is to be dealt with first? You may knock off one accident from each man in the 75 per cent and get a reduction of 75 accidents, or you can knock off three accidents from each of the 25 per cent and get the same reduction.

In Boston, work was started on the

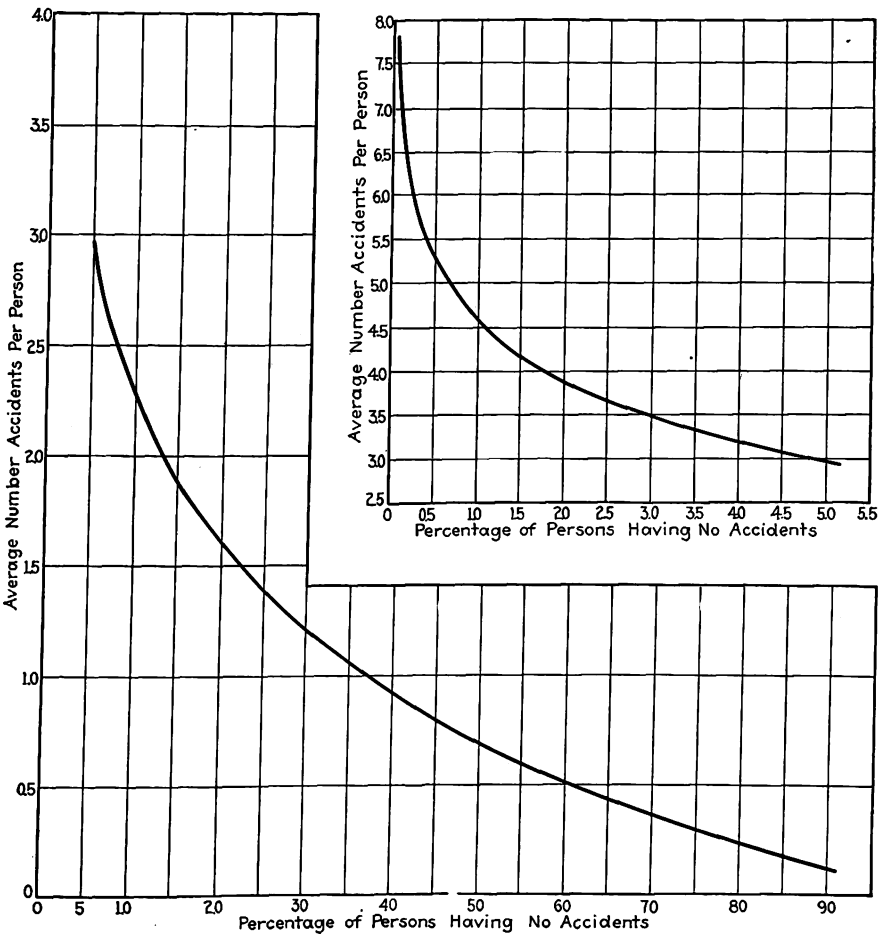

Chart used to determine whether a group contains men who are particularly susceptible to accidents

The chart at the upper right shows on a larger scale the upper end of the chart at the left. Owing to the steepness of the curve, when the percentage of persons having no accidents is less than 5 per cent, the readings can be obtained more accurately on the right-hand chart. To use this chart: (1) Find out how many motormen had no accidents in the period studied; (2) then read from this curve what the average number of accidents per man should be if there are no accident-prone men; (3) then divide the total number of accidents by the total number of motormen; (4) if (3) is greater than (2) it shows the presence of accident-prone men. The greater the difference the worse they are and the more there are of them.

These charts are drawn from tables published in the report of the Industrial Fatigue Research Board 34, of London, As they are based on the theory of probability, they are applicable to any industrial plant or department of a plant, and for any period, say one month, three months, or a year.

Of a large number of operators in Boston, it was found 4.6 per cent had no accidents during 1927. From the chart it should be expected then that the average number of accidents per man would be 3.1. Actually, it was found to be 5.45. This showed that a number of men required special treatment, and the next step was to find these men. If the actual average had been 3.1, the probabilities were that all men were equally careful and accidents might be reduced by stimulating all to increased care.

Abstract of paper presented at the annual conference of the Massachusetts Safety Council, Boston, Mass., April 30, 1928.

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small group of high-accident men for three reasons: (1) They seemed to be doing the best they could to avoid accidents and were fully as careful as the others. There was a general feeling that their accidents—and consequently all accidents—were due to bad luck. (2) It seemed that the use of any general methods applying to all the men—such as safety committees, rivalries between carhouses, bonus plans, etc., could not affect the high-accident men. (3) The effect of the work on the 25 per cent is likely to spread to the 75 per cent.

It was decided to treat certain men who had five accidents or more for the twelve months previous. The number could have been put at four or more, but it was a matter of how many could be dealt with in a reasonable length of time. The decision also depended to a certain extent on the statistical distribution. Previously there had been a tendency to deal with the men who had two or more accidents in one month, and no attempt made to try to find out from a man's accidents over a long period why he was having them. Little can be found out from one or two accidents about a man's actions, but from a number one can find what type of accident he is likely to have and what causes him to have accidents at all. Keeping records or even studying them, of course, isn't accident reduction. But records are essential in showing the men who are most likely to have accidents and in helping to prevent them from having more.

This is most important, particularly in view of the English finding, which is confirmed in Boston, that the man who has minor accidents is the man who tends to have major accidents. The English also found—this is likewise confirmed—that the man who has many accidents one year will generally have many in any other year. Quite often such a man runs along for an extended period, having a number of minor accidents which lead up to an accident costing the company $25,000 or more, its cause being exactly the same as that of the small accidents.

The methods in dealing with the high-accident men will not be detailed here. Each man has to be treated as an individual and dealt with differently. There were 181 men and they were treated 181 different ways.

Work was started on them in November and every man was tackled by Dec. 31. Their accidents started coming down in December and have kept down. Last year these men averaged 7.5 accidents each, making a total of 418 accidents during the first four months of the year. Up to the end of April in this year (one-third of a year) they had averaged 1.1 each or 3.3 per man per year, and the total number of accidents they had was 205. When the statistical curve was applied to the group it was found that 90 per cent of the high-accident men had been cured and were down among the average of the whole group. From the first of May they were no longer treated as a special group, but safety efforts were spread over all the operators, different methods being used, of course, in an attempt to obtain a general reduction. However, a statistical curve will be used each month all the time to check up on the high-accident group to see whether the practice of discontinuing treating them specially has caused them to slip back.

Organization and Value of Safety Committees*

By J. H. Handlon
Claim Agent, Market Street Railway, San Francisco, Cal.

UNTIL recently it was the practice of street railway companies, in their accident prevention work, to establish but one safety committee. This was known as a central or general safety committee. Serving on that committee was but one representative from each department, division, carhouse, repair shop, power station and office of that company. Changes were made in the personnel of this committee, monthly, quarterly, semi-annually or annually, or upon the resignation or death of a member of the committee.

In theory, this was an ideal arrangement, giving a full representation on the committee of all branches of the service. It was also thought that by inviting committeemen to monthly dinner meetings at the expense of the company there would be created a spirit of co-operation and fraternalism that would result beneficially. Many companies, impressed with that plan, adopted it.

When the task was undertaken of forming new committees to replace the old, it was found difficult to locate employees who were well qualified to serve as committeemen. Men who had other good qualities lacked the ability to obtain the hearty co-operation of fellow employees in safety work. Others were not sufficiently observant to detect weaknesses or defects that should have been readily discernable. There were still others who, while enthusiastic at the start, allowed their interest in accident prevention to abate, as time progressed.

It was also discovered that a committee composed of but one representative from each department was handicapped in attempting to consider intelligently ideas submitted to them, because each committeeman, while familiar with the workings of his own department, was not informed of the work of the other company departments. Therefore, he could not always visualize the conditions that prevailed in departments foreign to his own.

Under modern methods, general safety committees are composed of heads of all departments. The chairman of such a committee is usually the claim agent, safety engineer, or safety director of the company, although often that official merely acts in an advisory capacity.

Reporting to the general or central safety committee are the departmental safety committees, whose meetings are usually presided over by the assistant to the head of the department, general foreman or similar officer. These departmental committees have the advantage of being able to thresh out among themselves all safety ideas or safety suggestions that particularly involve the department in which they are employed. They are composed of division superintendents, inspectors, instructors, follow-up men, foremen, etc.

All committees meet monthly. The meetings of the departmental committees precede the meetings of the general safety committee, so that the latter committee, at its monthly meeting, has confronting it the reports of the various subordinate committees and their recom-

**Abstract of paper read at annual convention of Pacific Claim Agents' Association, San Diego, Cal., July 19-21, 1928.*

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Sept. 7*—Maryland Utilities Association, mid-year meeting, Braddock Hotel, Braddock Heights, Md.**

***Sept. 7-8*—Central Electric Traffic Association, Potawatomi Inn, Angola, Ind.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

***Sept. 25*—Central Electric Railway Master Mechanics' Association, Cleveland, Ohio.**

***Oct. 1-5*—National Safety Council, safety congress, New York, N. Y.**

***Oct. 8-12*—American Welding Society, fall meeting, Philadelphia, Pa.**

***Oct. 24-25*—Public Utilities Association of West Virginia, annual meeting, Huntington, W. Va.**

***Nov. 7-8*—Iowa Electric Railway Association, operating meeting, Roosevelt Hotel, Cedar Rapids, Iowa.**

***Nov. 14-15*—Public Utilities Association of Virginia, Roanoke, Va.**

***Jan. 23-25, 1929*—Electric Railway Association of Equipment Men, Southern Properties, Houston, Tex.**

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mendations. The departmental committees also review at their meetings the minutes of the previous meeting of the general safety committee.

On some properties, the general safety committee makes a tour of inspection the day of the meeting, but this is not always feasible.

The general safety committee is usually authorized by the management to place in effect all approved safety suggestions, provided the expense does not exceed a fixed sum, and the departmental safety committees are permitted to adopt any safety idea, the cost of which is nominal, or where the changes are minor in character, subject, however, to the approval of the head of the department.

All accidents occurring during the previous month that resulted in injury to employees within the department are reviewed by the departmental safety committee. All public accidents of an unusual nature, or which might have been prevented by the company or its employees, are likewise discussed by the general safety committee and measures for preventing a repetition of such an occurrence are either placed in effect or recommended to the management for adoption.

Proposed changes in traffic laws are advanced and reviewed, and support is given by the committee to those changes which they consider advantageous from a safety standpoint.

New safety devices are investigated and experimented with, and the experience of other street railway companies in the use of such devices is ascertained.

The committee is kept informed in a general way of what new methods are placed in effect by other street railway companies in their work of accident prevention, and serious accidents that occur on other properties, which come to the attention of the committee, are commented upon and steps are taken, if necessary, to prevent such accidents from happening.

The education of employees in first aid work is promoted through the general safety committee.

A continual watch is kept for new street hazards that arise from time to time as traffic is diverted or unusual conditions that present themselves on the thoroughfares traversed by the company's cars, and through this committee the aid of the police department is enlisted.

Safety Suggestions Solicited

Safety suggestions are earnestly solicited from all employees, and the public is encouraged to offer suggestions in accident prevention by being kept informed in a general way of the work the company is doing in that direction and of the willingness of the company to adopt any reasonable precautionary measures.

For the convenience of employees, some companies install suggestion boxes. Other companies invite their employees to submit their suggestions direct to the departmental safety committees or to the division superintendent, foreman, etc., either verbally or in writing.

Members of departmental safety committees and employees whose suggestions for safety have been put in effect are sometimes rewarded by the company for their efforts by being presented with badges, watch fobs, or similar tokens, indicative of the company's appreciation.

All persons making safety suggestions are informed of the action taken with their suggestion, so that if it is not approved they are made aware of the fact that the suggestion has received the fullest consideration and the reason for not adopting the suggestion is revealed to them.

On the properties of the Market Street Railway, San Francisco, employees are not restricted to making safety suggestions. All suggestions which are of a constructive and practical character and which consist of ideas, methods, practices or improvements not now in effect, are not only welcome but employees are urged to make such suggestions. If adopted, the suggestor is suitably rewarded with a cash prize. This policy has created a vast amount of interest among the men in the subject of safety, as well as a spirit of co-operation that is today one of the principal assets of that company.

Many unique yet practical ideas which were presented have been put into effect on these properties with splendid results, and they are still being received daily.

American Association News

Annual Convention Luncheon Conferences

PERSONAL invitations are being sent out by President Stevens to company members of the American Electric Railway Association, asking them to participate in the group luncheon conferences to be held at the hotels in Cleveland on Monday, Tuesday, Wednesday and Thursday, Sept. 24-27, during the annual convention of the association.

Attendance has been limited to 50 at each luncheon, because of the desirability of informal discussion. Tickets will be sold in advance at association headquarters. The luncheons will start promptly at 1 p.m., and the discussion will follow immediately thereafter, lasting until 2:30, so that there will be no interference with the afternoon sessions.

The following subjects will be discussed:

Monday—Safety, fares, taxation, manufactures.

Tuesday—Interurbans, traffic, education, merchandising.

Wednesday—Financing, public relations, new cars, small city transportation problems.

Thursday—Freight, management, motor bus.

Bulletins in Preparation

SPECIAL reports on several subjects are in preparation by the bureau of information and service of the American Electric Railway Association. They will be available to member companies on request. Following is the list:

Bulletin 212: Motor Bus Franchises—This contains complete copies of 27 street bus franchises granted to electric railways or their subsidiary bus companies and nine so-called car bus franchises (including two car-trolley bus franchises) providing for the joint operation of street railways and buses. Included in the bulletin is also a detailed analytical index permitting ready reference to any subject covered by the various franchises.

Bulletin 213: Motor Bus Operating Reports—This contains copies of the annual reports of a number of independent motor bus companies and summaries of the reports of large groups of companies to the state public service commissions, together with miscellaneous financing data on motor bus operations compiled from various sources.

Bulletin 214: Comparison of Electric Railway Operating Conditions, Operating Expenses, and Results of Operations on Various Unit Bases—1927. Part III Combination city and interurban lines—A tabulation of ratios and unit figures derived from the operating reports of combination city and interurban companies permitting an accurate comparison of their fundamental operating conditions and the results of their operations. Included in the data tabulated are average speed; number of passengers per mile of track, per car-mile and per car operated; operating ratio; gross and net revenue per mile of track; cost of maintaining plant and equipment per car-mile and per unit of property maintained; and operating costs on various unit bases of comparison.

Bulletin 215: Independent Motor Bus Lines—This is a tentative list of independent companies operating motor bus lines and has been limited to the companies operating ten or more buses or having a capitalization of more than $100,000. In each case there is given the name of the company and address, number of buses operated, location of routes and other available data descriptive of the operations.

The following supplements also have been prepared, bringing the information they cover down to date:

Supplement 10 to bulletins 163 and 164: Electric Railway Fares.

Supplement 5 to bulletin 188: Wages of Trainmen.

Supplement 5 to bulletin 189: Wages of Bus Men.

Bulletin 216: Cost of Living Studies.

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News of the Industry

St. Louis Appeals Fare and Valuation Issues

An appeal has been made by the City of St. Louis, Mo., to the Circuit Court of Cole County against the decision of the Missouri Public Service Commission granting the St. Louis Public Service Company an 8-cent fare and a rate-base valuation of $65,500,000. It also contends the 7.14 per cent return allowed the company on the $65,500,000 valuation is excessive.

The chief reliance of the city in its suit is that the valuation allowed is virtually that which the commission found would be the cost of reproducing the property. That the valuation should not exceed $53,000,000 and that the return should be limited to 7 per cent on that valuation are the views of the city. Eight cents is charged on all the bus lines operated by the company as part of its general system. Buses and cars interchange transfers without extra cost to the rider.

Extension of Time in Shreveport

Louisiana Commission is now studying application of company for 10-cent cash fare

ATTORNEYS for the Shreveport Railways, Shreveport, La., have requested the United States Court to grant a further extension until Sept. 17 to give the Public Service Commission ample time to consider the fare application of the company now under consideration by the Public Service Commission.

The fare issue affecting Shreveport dates back to Feb. 25, 1928, when the company applied to the Louisiana Public Service Commission for a 10-cent cash fare with a weekly permit to ride for 5 cents, three tickets for 25 cents and 4 cents for school children. At that time the company prepared statements showing the value of the property, taking an inventory and appraisal made by F. A. Jones of Dallas in 1922 and J. F. Coleman of New Orleans in 1923, brought up to date by additions and deductions, and a statement of earnings and expenses showing that the net earnings based on book value were only 2.83 per cent for the year 1927.

When on June 16 the commission failed to take any action upon the application, the company applied to the United States District Court for the eastern district at New Orleans for an injunction restraining the Louisiana commission from interfering with the collection of the rate. This application was set for hearing at New Orleans on July 9 at which time the chairman of the Louisiana Public Service Commission appeared and explained why the commission had not acted upon the application. The court continued the case until Aug. 6 in order that the commission might act. The commission set July 26 for hearing at Shreveport. After this hearing had proceeded it was adjourned until Aug. 6 by the chairman, who was called to New Orleans. Meanwhile he instructed the company to get additional explanatory statements which were prepared and furnished at the Aug. 6 hearing after the first adjournment.

The Mayor and commissioners of Shreveport intervened in opposition to the request for an increase and employed Colbert & Snider, a firm of public accountants, to check the accounts. Their findings substantiated the company's statements. The chairman of the commission expressed doubt as to the benefits that would accrue to the company by the adjustment of fare, complaining that when the rates were made too high the public would seek other means of transportation.

Changing Aspects of Transportation

Boston system furnishes striking example. Car riding for pleasure is still to be cultivated

AN ARTICLE, illustrated with graphs, in a recent number of *Co-Operation*, published by the Boston Elevated Railway, Boston, Mass., reflects the effect of the auto on the number and character of passengers carried on that system and quotes figures which as the Boston *Herald* sees them "will astonish those who have been reading about expansion programs entailing an outlay of $25,000,000 or $50,000,000."

Back in 1915, the "L" carried about 352,500,000 passengers, and last year the total was only 366,900,000, an increase of 14,400,000, or about 4 per cent in twelve years. More surprising still, back in 1917 the total was 381,000,000, or about 14,100,000 more than in 1927. That is, the traffic in 1917 was as much greater than in 1927 as the traffic of 1927 was greater than that of 1915. Of particular interest is the change in the kind of passengers. *Co-Operation* says:

> Pleasure riding has practically disappeared and business riding has apparently increased. The automobile has taken passengers away on Saturday and Sunday and in the summer months. The summer vacation has become prevalent in practically all industries.

Experts of the company cite figures showing that, Saturday and Sunday riding excluded, the "L" averaged about 1,074,000 passengers weekly in 1917; 1,087,000 weekly in 1926, and 1,079,000 in 1927. On Sundays in 1917, the average was 728,800; in 1926 it was 576,700, and in 1927 it was 555,300. The Sunday decrease between 1917 and 1927 was therefore about 173,500. The weekday traffic of August, 1927, was less than that of August, 1917; the weekday traffic of January, 1927 was slightly greater than in 1917. The number of holiday passengers was smaller by almost 200,000 in 1927 than in 1917. The company thus concludes:

> The railway service is becoming more and more a business service. Its main and primary function is taking people to work in the morning and home at night. There has been an accentuation of the peak hour of the day.

As the *Herald* interprets these facts the automobile has been the main influence in these changes, no doubt, and other agencies also are at work. The 10-cent fare has probably had some effect. The disappearance of cars from the surface in various places has been another factor. Many old lines have been discontinued and the end has not come yet. Old tracks are coming up and few new ones are going down. There was a time when it was said that more street cars passed Milk and Washington Streets than any other corner in the United States. No cars at all pass that corner today. Again, the short haul has not bulked nearly so big in recent years. The *Herald* concludes:

> It is not safe to assume, however, that car riding for pleasure has gone definitely. The elevated, we notice, is advertising in newspapers, by billboards and on the cars themselves, the pleasure spots which are within easy reach of the city by trolley. At the same time the builders are themselves doing considerable to win back the pleasure-riding passengers by improving both the outside appearance and the inner comfort of cars. While the drift from the street cars to the automobile was at its height railway men seemed to the layman to be a little bit dazed by the tendency. But now they seem to have got their second wind. Strangely enough, the railroads are also making efforts to induce the people to use the trains more often. The steam road stresses the dovetailing of the automobile and the train. Governor Fuller, it has been pointed out, uses his automobile to go to the North Station, takes the Boston & Maine to Rye Beach and there proceeds by another automobile to his house. Similarly it is not at all unusual for persons who work in Boston and live some distance away, to drive in to a point where they can board a street car.

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Higher Fares Filed by Queens Road

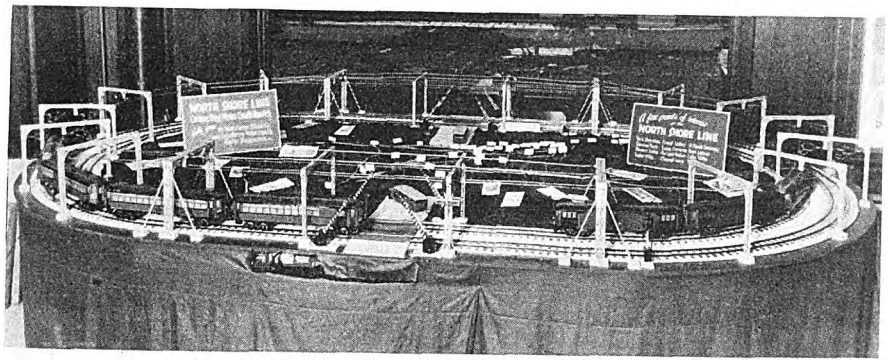
Seven cent fare schedules, effective Sept. 10, have been filed with the Transit Commission by the receivers of the Steinway Railways, comprising a group of surface lines in Queens.

The Steinway Railways group includes the Dutch Kills, Jackson Avenue, Steinway, Ravenswood, Flushing Avenue and Broadway lines in Queens. A 5-cent fare is now in force on all these routes. The group of surface lines originally included in the New York & Queens County system, became a separate unit several years ago.

It's All There for the Observer

A miniature replica of a modern electric interurban railway is being used effectively for exhibition purposes by the Chicago, North Shore & Milwaukee Railroad as a graphic illustration of North Shore Line service. The model is built on the scale of one-half inch to the foot, and faithfully reproduces the entire North Shore Line system, including both rail lines and auxiliary Marigold motor coach routes, with cards designating all important points served.

The exhibit was recently displayed in the window of the Outing and Recreation Bureau at 72 W. Adams Street, Chicago, a public information service maintained by the North Shore Line and associated public utility companies serving the Chicago metropolitan area. According to John J. Moran, commercial manager of the North Shore Line, it is planned to use the model at various fairs and other public gatherings in the territory served by the railroad.



Ingenious device to show North Shore service

Survey Reported in Houston

Mayor Holcombe, of Houston, Tex., has taken up the matter of a survey to be made of the entire street railway situation in that city and is reported to have consulted with J. A. Beeler, traction expert, New York, looking toward retaining of experts for a transportation study in the interests of the city.

This action follows the proposition made by Jeff Alexander, manager of the company, at a hearing before the City Council, to sell the railway system of the Houston Electric Company to the city. The hearing was for the purpose of considering the removal of the car tracks from one of the principal streets, and the substitution of bus service. At that time, Mr. Alexander said that the city must buy the company, subsidize it, or the matter would end in the courts, for it was impossible for any private corporation to continue to give something that cost more to operate than it received for the service.

Change in Name of St. Louis Loan Association

The name of the building and loan association of the employees of the St. Louis Public Service Company, St. Louis, Mo., has been changed from the United Railways Savings & Loan Association to the Public Service Savings & Loan Association. Organized in 1915 the association has been successful in promoting thrift and home-owning among the employees. It now has assets of $4,800,000 and is authorized to sell stock with a paid-up value of $12,000,000, compared with $1,000,000 when it was organized. The company has handled $18,000,000 of its members' money, and in 26 consecutive semi-annual dividends at the rate of 6 per cent per annum, has paid $1,187,000 in dividends to the savers.

details of equipment and operation.

The two-track right-of-way is ballasted with fine gravel. Overhead is catenary construction, with minature steel towers and copper trolley wires. Around the circular tracks run two four-car trains. One is a miniature duplicate of an all-steel passenger train, composed of two passenger coaches, a diner, and a parlor-observation car. The other is a merchandise dispatch train, including three cars used for handling regular less-than-carload freight shipments and one electric refrigerator car for handling perishables. All the cars are painted in the new North Shore Line colors of orange with maroon trimmings. The interiors of the passenger cars are illuminated by tiny electric bulbs.

There are two crossings, protected by the new type of electric automatic safety gates recently installed at several points on the North Shore Line. These gates are operated by completion of a track circuit by approaching trains and function without human assistance. For the passing motorist who disregards the warning lights and bells and strikes the gates, they swing horizontally and later return to their upright position without being damaged by the impact, thus insuring maximum crossing protection at all times. Automatic block signals also alternately flash green and red as the trains circle the tracks.

The Marigold motor coaches of the metropolitan system, which are operated extensively throughout North Shore territory in cross-country service as feeders to the rail lines, are stationed near the tracks. In the center of the oval formed by the tracks, laid out in colored rubber hose, is a bas-relief of

To Operate Between Ballston Spa and Saratoga Springs

There was no opposition at a hearing held Aug. 9 before the Public Service Commission on the petition of the Schenectady Railway for approval of contracts affecting it, the Hudson Valley Railway and the Delaware & Hudson Company, by which its cars may continue to operate in and between Ballston Spa and Saratoga Springs, N. Y. The Schenectady Railway proposes to lease two of the Delaware & Hudson Company tracks which it has used for several years past, .09 mile of track in Ballston Spa, from the Hudson Valley Company, and to use jointly the Hudson Valley Terminal in the city of Saratoga Springs. Attorneys for the Schenectady Railway stated that if this request is granted it would enable the Schenectady company to have through traffic from Albany to Saratoga Springs.

Increased Speed for Kansas City Cars Sought at Hearing

A recommendation that the speed of street cars be increased to 15 m.p.h. in the business district of Kansas City, Mo., and 25 m.p.h. in the residential section was made by the Council as the committee of the whole at a hearing on the revised and compiled general ordinances into one document. The present speed limit is 12 m.p.h. in the business district, and 20 in the residential district. Officials of the Kansas City Public Service Company asked for an increase at the hearing so the street cars could move with the flow of motor traffic.

Fare Hearing in New York Postponed

First of the public hearings on the 7-cent fare schedules filed recently by the Eighth and Ninth Avenues Railway has been postponed by the Transit Commission until Sept. 7. Formal objection by the city of New York, to the granting of the 7-cent fare was filed by Corporation Counsel Nicholson of the Transit Commission on Aug. 6. Mr. Nicholson contended that the Transit Commission had no jurisdiction or power to grant the requested increase.

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New Service for Chicago Travelers

The Chicago, North Shore & Milwaukee Railroad announces the completion of arrangements to sell Pullman tickets to all points throughout the country served by interconnecting steam lines operating out of Chicago. Purchasers travel by the North Shore Line to Chicago, where they transfer to the train on which their Pullman reservation has been made. The interurban is the first transportation system not under contract with the Pullman company to be granted this sales privilege.

R. S. Amis, general passenger agent, said that the addition of Pullman reservations to interline rail ticket sales service gave the North Shore Line a complete hook-up with other mediums of transportation.

Full Publicity but Not Propaganda

The *Security Owner*, organ of the National Association of Owners of Railroad and Public Utility Securities, declares that since newspaper comments on the Federal Trade Commission's utility inquiry have been almost exclusively devoted to one phase of the investigation, the impression has been erroneously created that the publicity practices of utilities are vicious. As this commentator sees it, inasmuch as the utilities furnish indispensable services which the industries of the country must have in ever-increasing quantities, it is important that a continuous knowledge of the facts concerning their management and operation should be furnished the public. This can be attained only through a proper use of publicity. The *Security Owner* says in part:

The utilities have been active in disseminating information so as to give the public a more intimate knowledge of public utility problems. This is a perfectly legitimate and even commendable practice to which no odium should attach. Indeed informative publicity is in the public interest in that it enables the public more clearly to understand the importance of public utility questions which constantly and vitally affect their daily lives.

An informed and intelligent opinion is essential to the welfare of utilities, which not only have a right frankly to explain their problems to the public but would be derelict in public duty if they did not do so. They must protect their stockholders and customers from the effects of unwarranted attacks based on misinformation and must voice an effective protest against unwise action by governmental officials. In other words they must appeal their case to public opinion and in order to do so information must be disseminated. This is not a corrupt practice or even misconduct but the exercise of a lawful right. No convincing reason has ever been urged against it.

For the most part publicity by utilities has been legitimate and by proper methods, but it appears that certain overzealous agents of the utilities have carried their campaigns too far. Publicity of this character must be distinguished from legitimate publicity, which has for its purpose the disclosing of factual data and accurate and dependable information. The industry should continue its splendid work in disseminating accurate information so as to insure public understanding but it should cease once and for all any attempt at propaganda which is not essential.

Subway Progress in New York

Appropriations made for $20,000,000 construction projects. Hearings scheduled for other work. Summary of Board's work

A PUBLIC hearing will be held on Aug. 31 by the Board of Transportation of New York to decide on the forms of contract to be issued for the construction of the city subway on Northern Boulevard from 36th Street to Broadway, Queens, and along Steinway Street from Northern Boulevard to 53rd Place, Long Island City. The boroughs of Brooklyn and Queens have almost as many miles of subway under construction as Manhattan. The entire new system will include 57 miles of track, and will cost in the vicinity of $700,000,000, of which nearly $70,000,000 is already under contract in Brooklyn and Queens. According to present plans the whole system will be finished some time in 1931.

On Aug. 16 an appropriation of $20,000,000 was authorized to the Board of Transportation by the New York City Board of Estimate to complete subway construction. The largest item was $10,000,000 to pay condemnation awards on property in Church Street already acquired for the Eighth Avenue subway. Other items included $5,295,000 for the construction of the Smith Street section of the Culver line subway in Brooklyn, and $3,400,000 for the extension of the Fourteenth Street-Eastern line from Sixth to Eighth Avenues, Manhattan.

Contracts have been awarded by the Board of Transportation of New York City in the last four years for rapid transit facilities totaling $261,049,854. Of this sum, Chairman Delaney points out in a summary of the board's achievements, $215,750,162 was for 22 miles of the city's new independent system, extending the length of Manhattan Island and under the Harlem River to the Bronx and across 53d Street to Long Island City as well as to downtown Brooklyn by way of Fulton Street and a new East River tube.

Under contracts No. 3 and No. 4 with the I.R.T. and the New York Rapid Transit Corporation, Chairman Delaney's summary says, $45,000,000 worth of contracts have been awarded for construction, most of the expenditure going into the 3½ miles of the Fourteenth Street-Eastern subway, the Nassau Street subway, Coney Island yards, the Flushing Extension from Corona, extension of the Queensboro subway to Times Square, platform extensions in 40 B.-M.T. stations and various yard construction jobs, transfer facilities, station entrance relocations and other enterprises.

During the past four years, Chairman Delaney announced, the following payments have been made by the city on vouchers certified by the Board of Transportation:

City's new system	$129,471,798
B.-M. T. system	32,954,653
I. R. T. system	14,027,036
Miscellaneous	631,020
Total	$177,084,510

This total represents about 38 per cent of the city's rapid transit construction cost of $457,728,680 in the past 28 years.

Chairman Delaney's summary shows that the board has awarded, in the six months ending June 30, 1928, contracts amounting to $28,991,054, divided as follows:

City's new system	$27,937,100
B. M. T. system	945,669
I. R. T. system	108,284
Total	$28,991,054

The addition to these figures of $5,255,751 in contracts not yet awarded brings the six months' total to $34,246,805.

The summary refers to the letting of the contract for additional transfer facilities at Union Square between the Fourteenth Street-Eastern and Broadway-Fourth Avenue lines of the B.-M.T., which are expected to afford material relief for congestion at Canal Street.

The Board of Transportation was created by act of the Legislature four years ago to enable New York City to design, construct and operate its own rapid transit system as well as to construct additions and extensions.

Rerouting in Columbus to Be Considered

The City Council of Columbus, Ohio, has set Sept. 10 for a public hearing on rerouting four street car lines operated by the Columbus Railway, Power & Light Company. The proposal arose out of the council's recent action in placing the Main-Neil cars back on High Street requested by business groups.

Wage Issue in London, Ont.

Demands from employees of the London Street Railway, London, Canada, for an increase in their wage of 7, 12 and 15 cents an hour and a reduction in hours have been refused by the management. The men are now applying for a conciliation board under the industrial disputes act. The London Street Railway is operating on a 5-cent fare and claims it is unable to pay any increase in wages, or satisfy the men's demands.

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Hail and Farewell in Augusta

The Aug. 9 *News Letter* published by the Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., is intended as an introduction to the Southeastern Power & Light Company, recent purchasers of the property. It carries the picture and a brief sketch of nearly all department heads, and also a few lines regarding some of the oldest employees. In this way new owners can become familiar "with the faces, records, capacities and other qualifications . . . ." The passing of the Augusta system into Southeastern hands was referred to in ELECTRIC RAILWAY JOURNAL, issue of Aug. 11, 1928. Under "Farewell and Greetings" a laudatory comment is made on the passing of the J. G. White Management Corporation and a welcome is tendered to the new associates.

Bridge Talk in Omaha Does Not Affect Submission of Ordinance

So far as the City Council of Omaha, Neb., is concerned there will be no amendment to the franchise ordinance for the Omaha & Council Bluffs Street Railway. Disregarding the demand of United States Senator Howell that the sale to the city at the original cost of the bridge across the Missouri River be made a part of the transaction, that body has ordered the question submitted to the voters at the November election exactly as drawn up in the final negotiations with President Shannahan. The bridge sale agitation has taken a new form, that of the filing of a petition for a voters' referendum on a proposal to issue $800,000 as the county's share of a free bridge across the river. This would have to be followed by a city bond issue, and when carried the authorities would be in a position to negotiate for the purchase of the company's bridge.

Treadle Exit Explained to Patrons

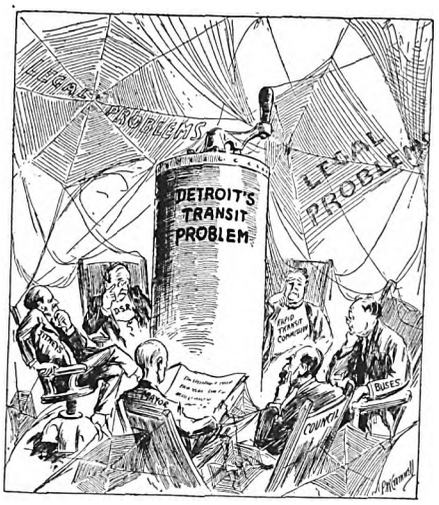
A four-page folder is being distributed by the East St. Louis Railway, East St. Louis, Ill., on the various city divisions having the automatic rear treadle exit doors. The folder called "Facts of Interest About This Safety Car," explains to patrons the convenience offered by the rear treadle and is illustrated by several pictures showing its use and operation. In introducing the treadle the company states that this is its first appearance in East St. Louis.

Aurora Line Announces Transfer Privileges in Chicago

The Chicago, Aurora & Elgin Railroad has announced that its patrons can transfer, free of charge, to any elevated train operating in the city of Chicago. At Marshfield Avenue, at Canal Street (Union Depot), or at the Wells Street Terminal the change may be made. Chicago, Aurora & Elgin trains enter Chicago and leave it over the tracks of the Garfield Park branch of the Chicago Rapid Transit Company.

Caution Suggested in Dealing With Detroit Commission

Members of the City Council of Detroit, Mich., favor doing away with the services of some or all persons connected with the rapid transit commission. Four Councilmen believe the people should have a chance to vote on the amendment eliminating the commission. Four others take the position that present defects in the Detroit Municipal Railway system could be remedied by reducing the allowance for the commission's operation. At a recent meeting of the Council William P. Bradley, asking that nothing be done until John C. Nagel, acting Mayor, is back in the Council, said:



—Detroit *Times*

Need of a superman pictured in Detroit

> Whenever a large building is erected or a large sewer installed, though, the transit commission studies the situation to see that nothing done will interfere with the building of subways. The commission has done most important work since it was founded in 1922, and its results far outweigh the $335,000 it has required to date or the $1,000 additional it costs each week. The commissioners are working tirelessly for the city's interests. I believe subways or elevated railways are bound to come as the city grows, and I would consider it a serious mistake to discharge the commissioners. One engineer and possibly an assistant or two should be enough of a staff for the present, however, in my opinion.

The commission consists of Col. Sidney D. Waldon, Col. H. W. Alden, Clarence W. Hubbel, Andrew H. Green, Jr., and Willard Pope. The commissioners serve without pay, the expenditure of $50,000 a year going mainly to the commission's employees. In 1923 it outlined a subway system on which nothing was done because of the tremendous cost. In 1926 it proposed its $28,000,000 "start" on a subway system, but this too was shelved. Since then the commission has made no new offer.

Fare Applications Before Virginia Commission

The petitions of the Lynchburg Traction & Light Company and Roanoke Railway & Electric Company for fare increases have been heard before the Virginia Corporation Commission, with most of the evidence dealing with the value of the company's traction properties. Increases have been suspended until Sept. 1. The cases are now under advisement. Both companies claim they are operating at a loss.

L. M. Zapp, Chicago engineer, who recently made a survey of the Lynchburg properties, has been on the stand. He was questioned on the value of the traction equipment and on the basis on which current expense figures were drawn. City Attorney T. G. Hobbs, of Lynchburg, questioned Mr. Zapp closely upon his evidence.

A financial statement covering the affairs of the Roanoke Railway & Electric Company for the past four years has been presented to the Roanoke City Council as an explanation of the necessity for increased revenue. The statement was in the form of a letter from C. B. Short, manager of the railway, and the Safety Motor Transit Corporation, recently consolidated. Coordinated service is proposed by the two companies under the plan for increased fares and revision of bus routes. One item in this statement is as follows: Net income or deficit, 1924—$8,513; 1925—$2,759; 1926—$44,365 (deficit); 1927—$79,114 (deficit).

Both companies have asked that the fares be raised from 5 to 7 cents, with four tokens for a quarter and unlimited transferable weekly pass for $1.

Justice Asked for Indiana Interurbans

A stand in support of interurban electric railways of Indiana in competition with buses and automobiles was taken recently in an order written by John W. McCardle, commissioner of the Indiana Public Service Commission, and approved by the commission in which a petition for extension of bus service of the Hoosier Transportation Company was denied. An investigation by David Matthews, railroad inspector for the commission, included in the order, showed the facilities offered by the Terre Haute, Indianapolis & Eastern Traction Company's line, which parallels the proposed route, were adequate. In his order, Mr. McCardle wrote that to operate a bus line not actually necessary, paralleling and in competition with an interurban railway was unsound, uneconomical and unfair, where extra taxes would have to be shifted to farmers and small home owners. He pointed out the difficulties under which electric lines have been operated, due largely to increased use of the automobile, and said that taxing officials, recognizing this handicap, have reduced the taxes on such utilities.

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Recent Bus Developments

Nineteen Miles of Bus Route in Connecticut Approved

Permission has been given the New Haven & Shore Line Railway by the Connecticut Utilities Commission to abandon approximately 19 miles between Guilford and Saybrook, and to substitute buses. Trolley operation between New Haven and Guilford is still retained.

This substitution has been brought about very largely by the fact that the company has many bridges on this particular part of its line and the repair and renewals, as well as the maintenance and rebuilding of track and overhead, which have been deferred to a large extent, would prove too burdensome. Moreover, the railway parallels the greater part of this route with bus operation so it was considered advisable to go to bus operation entirely.

The Groton & Stonington Traction Company, which is managed by C. O. Weidman, general manager of the New Haven & Shore Line Railway, was changed over from trolley to bus on July 29 last. This was due to heavy expenditures which would have to be met within the next year, brought about by highway improvements in which the company was heavily involved and also to heavy operation costs due to the use of old-fashioned car equipment.

Quicker and Shorter Service Into St. Louis

The recent completion of the two new Lewis and Clark Bridges over the Missouri and Mississippi Rivers pave the way for the Alton Railway to operate the new St. Louis-Alton motor coach route in connection with the Bellefontaine lines, giving Alton patrons a shorter and quicker route into St. Louis. Recently, the Alton Railway took over the operation of the Bellefontaine Bus Company, operators of bus lines from Baden, North Broadway, in St. Louis to Riverview Gardens, Spanish Lake, Chain of Rocks and Parkview Amusement Park. Purchase of the bus line by the Alton Railway includes the necessary certificates of convenience to operate buses on three routes. The district they serve is partly residential with numerous truck farms scattered in between small villages. S. A. Parnell, who organized the Bellefontaine Bus Company, has been retained by the Alton Railway as supervisor.

A New Love Proves False in Washington

IT NOW seems certain that the Independent Taxicab Association of the District of Columbia definitely has abandoned its intention of resuming its rush-hour jitney service, despite the representations of the drivers that they had merely suspended the service in order to make further studies. The opinion that the jitneys will appear no more is shared by officials of the Public Utilities Commission and others cognizant with Washington's transit situation.

The Independent Taxicab Association, which is composed of 160 taxi men each one of whom owns his own cab, tried the experiment of operating a jitney service during the morning rush hour. As there is little demand for taxicabs at this time of day, it was thought that it would prove profitable to fill the cabs with office workers and carry them to fixed points in the business center for 10 cents a head. The third morning of this service turned out to be very rainy. A sudden demand for taxicabs was created with the result that the drivers could not resist the temptation of going after the more profitable business. They accordingly hauled in their destination signs and left their newly-won patrons waiting on the street corners.

This sudden desertion of the public resulted in such a protest on the part of civic bodies that the Independent Taxicab Association decided to discontinue the jitney service. The officers of the association found that they could not compel the drivers to stick to their routes, since each cab is independently owned and operated.

At the same time, the District of Columbia Public Utilities Commission was not entirely powerless to deal with the situation. By taking advantage of a court decision which ruled that taxicabs operating between fixed points were common carriers, the utility authorities were confident that they could bring the jitney drivers to terms. It is admitted, however, that it would severely tax the facilities of the commission to have to impose regulations separately on each of the 160 drivers as common carriers.

It is therefore thought that matters would be greatly simplified if the commission could be given authority to regulate taxicabs. In accordance with this thought, legislation is now being drafted with the expectation of bringing it up before Congress during the next session.

Co-operation with Railway in White Plains

The Soundview Transportation Company, Inc., was given a certificate by the Public Service Commission on Aug. 10 for the operation of buses in White Plains on Old Mamaroneck Road from Soundview Avenue to the city line at Scarsdale. This route will be operated as an extension of the present system. The Commission held that convenience will be afforded residents of the Ridgeway Station section where the buses will operate in co-operation with the New York, Westchester & Boston Railway.

Marshalltown Turns to Bus

Bus service has supplanted the electric railway system of the Iowa Railway & Light Corporation, in Marshalltown, Iowa. In place of the seven electric cars the new schedule requires six buses. A bigger territory is covered by the bus, and for the first three weeks the buses were in service operation showed a gain in revenue over the previous three weeks' operation of the street cars. Marshalltown has a population of approximately 16,500.

Extension of Service Authorized in Virginia

The Safety Motor Transit Corporation, owned by the Roanoke Railway & Electric Company, has been granted permission by the State Corporation Commission to operate passenger buses half a mile beyond the corporation limits of Vinton. A petition seeking the permit was laid before the commission several weeks ago. This extension in service is in line with similar changes proposed for the city.

Would Discontinue Shuttle Line in Utica Another Year

The New York State Railways applied to the Public Service Commission on Aug. 3 for approval of the continued discontinuance of operation of its Auburn Avenue shuttle line in Utica until July 1, 1929. Operation was temporarily discontinued on Jan. 14, 1925. The petition states that the Co-ordinated Bus Lines is providing transportation service in that part of the city.

Transfer Charge Requested in Washington

An application for authority to charge 2 cents for transfers issued between cars and buses at Fifteenth and H Streets northeast has been filed with the Public Utilities Commission by the Washington Railway & Electric Company, Washington, D. C.

Free transfers have been issued between the buses and the cars ever since bus service was substituted for rail serv-

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ice on Bladensburg Road more than five years ago. This arrangement, the commission decided at the time, should exist for a five-year trial period, after which it would consider whether a change should be made.

Last month President Ham of the railway explained that during the five-year trial period the company had lost $44,511 and that relief was necessary.

Proposed Line Abandoned

The California Railroad Commission has dismissed the application of the Los Angeles Railway Corporation for a certificate to operate bus service connecting the Washington Street car line with the city limits at Culver City. Because of the abandonment of the proposed stage line by the Pickwick Stages between Los Angeles and Venice, the company has abandoned the proposed bus line.

Pittsburgh to Wheeling

Through bus and rail service between Pittsburgh, Pa., and Wheeling, W. Va., was started on July 25 when combination tickets were placed on sale by the Pittsburgh Railways and the Washington Transportation Company. Passengers are carried over the interurban lines of the railway between Pittsburgh and Washington, Pa., and by bus between Wheeling and Washington. Through fare is $1.45—70 cents on the railway and 75 cents on the bus.

Change in Cincinnati Terminal

Interurban bus operators have chosen the old Y.W.C.A. building and adjacent property on Eighth Street between Vine and Walnut Streets, Cincinnati, for an interurban bus terminal, E. D. Gilman, Cincinnati public utilities director, announced on Aug. 10. The interurbans have been using Government Square as a terminal, but Director Gilman instituted action to oust them by Sept. 1. New plans call for service lanes on the west side of the Y.W.C.A. building, which structure will be used for waiting rooms, concessions, ticket offices and the like.

Buses Replace Cars on New Rochelle Line

Authorization was given the Westchester Street Transportation Company, successor to the Westchester Electric Railroad, by the city of New Rochelle, N. Y., Aug. 15 to replace its East Main Street cars with buses. The railway is allowed to charge a 10-cent fare on the buses. Recently an attempt to induce the City Council to reconsider the proposal of the Third Avenue Railway to substitute buses over this route under conditions requested by the railway failed when the Councilmen refused to put the suggestion for reconsideration into the form of a motion.

Financial and Corporate

One-Year B.-M.T. Notes to Be Sold

At a special meeting of the board of directors of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., held on Aug. 13, the board authorized the sale to the Chase Securities Corporation, Hayden, Stone & Company, and J. & W. Seligman & Company of $10,000,000 one year 6 per cent notes to be dated Aug. 1, 1928, and to be secured by $12,000,000 principal amount of New York Rapid Transit Corporation's refunding mortgage 6 per cent sinking fund gold bonds—series B. These are a part of $17,000,000 of such bonds authorized some time ago by the Transit Commission to be issued by the New York Rapid Transit Corporation on account of extensive purchases of new cars and other capital betterments and to be sold to the Brooklyn-Manhattan Transit Corporation.

Since the Transit Commission authorized the issue of these bonds the Brooklyn-Manhattan Transit Corporation has purchased $14,000,000 in principal amount thereof in order to provide the New York Rapid Transit Corporation with funds for new cars and other capital betterments under contract No. 4. The statement of G. M. Dahl, chairman of the board, said that the sale of the one-year notes by the Brooklyn-Manhattan Transit Corporation was for the purpose of replenishing its treasury in part for funds used in purchasing these bonds.

Service Improvements in Mexico Increase Earnings

Gross earnings of the Mexico Tramways, Mexico City, for 1927, amounting to $11,010,865 (Mexican Currency), compared with $9,931,280 for 1926, show an increase of $1,079,585. A net operating profit of $885,659 is shown, after making deductions for tax payments and depreciation, an increase of $807,155 over the previous year. These facts were disclosed in the annual report of the president, G. R. G. Conway, for the year ended Dec. 31, 1927. An improvement in the earnings received from operation are attributable to service changes and to the increase of twenty new cars.

STATISTICS OF MEXICO TRAMWAYS

	1926	1927
Average earnings per passenger car per day	$63.86	$70.94
Average receipts per passenger car-mile	0.5117	0.5409
Operating expenses, excluding taxes and depreciation, per car-mile, passenger services.	0.4758	0.4610
Operating expenses, including taxes and depreciation, per car-mile, passenger services.	0.5237	0.5065
Daily average earnings from operation	27,208.99	30,166.76
Daily average operating expenses, excluding taxes and depreciation	24,439.88	25,164.50
Daily average operating expenses, including taxes and depreciation	26,993.91	27,740.29
Percentage of gross expenditures, excluding taxes and depreciation, to gross earnings	89.82	83.42
Percentage of gross expenditures, including taxes and depreciation, to gross earnings	99.21	91.96

Car Earnings

	1926 (Mexican Currency)	1927 (Mexican Currency)
Passengers	$7,483,549	$7,628,694
Weekly tickets	.....	1,755,071
Monthly tickets	1,586,366	862,503
Chartered cars	39,378	35,611
Freight	371,576	307,319
Baggage and parcels	110,495	120,226
Funerals	182,887	162,112
Omnibuses	.....	.....
Total	$9,774,253	$10,871,536
Miscellaneous earnings	157,026	139,328
Total earnings	$9,951,280	$11,010,865
Expenses		
Operation	$6,506,747	$6,830,430
Maintenance, taxes and depreciation	3,346,029	3,294,775
Total expenses	$9,852,776	$10,125,205
Net earnings from operations in Mexico	$78,504	$885,659
Passengers Carried		
First class	63,844,517	97,952,924
Second class	23,090,106	15,590,269
Omnibuses	.....	.....
Total	86,934,623	113,543,193
Car Mileage		
Motors and trailers	17,792,413	19,014,647
Gasoline and mule cars	1 50,221	150,871
Freight and sundry	625,375	576,282
Omnibuses	.....	.....
Total	18,568,009	19,741,800
Average number of passenger cars operated per day		
Electric	389	396
Gasoline and mule cars	4	4
Omnibuses	...	...
Total	393	400

The total number of passengers carried under the new system between April 1 and Dec. 31, 1927 was 91,533,-210, compared with 66,245,201 for the corresponding nine months of the year 1926, and the gross earnings showed an increase of about $1,000,000 (Mexico) over 1926 during a similar period.

The amount of $1,463,285 (Mexican currency) was expended during the year for repairs and maintenance of equipment, and $850,192 was spent on track, overhead lines and buildings. These two items represent a combined expenditure of $2,313,477 out of a total maintenance cost of $2,354,611. A decrease of $59,199 is shown in these expenditures compared with the previous year.

Operating expenses, at $6,830,430, increased $323,682. Taxes paid were $340,164, an increase of $7,945 over 1926. The total increase in expenses amounted to $272,429.

The accompanying table shows the gross earnings, operating expenses, and miscellaneous information for the years 1926 and 1927:

During the year $1,083,473 (Mexican currency) was spent upon new completed and uncompleted construction

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work, and upon reconstruction work properly chargeable to capital account; property and equipment retired represented a value of $378,188 (Mexican Currency) making a net addition to the capital account and its subsidiaries of $705,284 (Mexican Currency.)

During the year an order for twenty new steel cars was placed with the J. G. Brill Company, Philadelphia. These cars are of the 600 series, with centre exit, similar to the 30 cars placed in service in 1924, which have proved to be very popular with the public. These cars were received and placed in service during the months of September and October. Six passenger cars, and several trail and freight cars, were retired as being unfit for further service.

Jitney competition continued to be severe, but the jitney lines, in many cases, found it necessary to reduce fares and issue special rate tickets in order to compete with the street railways.

Track mileage in 1927 covered 208.4 miles.

Chicago Reports June Traffic

There was an increase of 1,512,003 in total rides on the Chicago Surface Lines during June compared with June, 1927, but there was a decrease of 477,570 in the number of revenue passengers. The 133,095,478 rides, including transfers, not only exceeded the number in June, 1927, but were 115,177 more than in June, 1926, when the Eucharistic Congress was held in Chicago. Revenue passengers for the month numbered 72,957,212, compared with 73,434,782 in June, 1927.

Gigantic Utility Consolidation in New York Approved

Approval by the New York Public Service Commission of a billion-dollar consolidation of the Brooklyn Edison with the Consolidated Gas Company of New York has brought virtually all the light, power and gas companies in the Greater New York district under Consolidated Gas ownership. Although the Governor had requested that individuals or organizations be given an opportunity to be heard for or against the petition, the Public Service Commission refused to re-open the hearings, thereby sanctioning the deal whereby the Brooklyn Edison Company becomes a component part of the Consolidated Gas Company through exchange of stock on a basis agreed upon. It is definitely stipulated in the commission's statement that capital expenditures of the Consolidated Gas Company in acquiring stock of the Brooklyn Edison must be limited to the book value of the latter, or approximately $137 a share instead of the market value of $250 a share. No railway properties are involved.

Both George B. Cortelyou, president of the Consolidated Gas Company, and Matthew S. Sloan, president of the Brooklyn Edison Company, expressed the belief that real benefits would accrue from the merger.

Loss on Gloversville Road

In the annual report of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., for the year ended Dec. 31, 1927, J. Ledlie Hees, president, said that the net income would have been $44,435 if deductions of $43,074 had not been previously made for depreciation charges and "Amortization of Discount on Bonded Debt." Corporate surplus on Dec. 31, 1927, was $399,201 and depreciation reserves $750,746. Capital expenditures for the year were confined to paving and street improvements in cities, required by statute, and to the improvements of existing property. There were charged to investment, road and equipment expenditures for additions and betterments the sum of $15,759.

In 1927 the company carried 3,768,726 passengers on its electric division over 18,843,630 miles at a revenue of $608,648 compared with 4,484,506 passengers in 1926 over 22,422,530 miles at a revenue of $642,141.

INCOME ACCOUNT OF THE FONDA, JOHNSTOWN AND GLOVERSVILLE RAILROAD

Railway Operating Revenues	1927	1926
Freight revenue	$449,616	$472,804
Passenger revenue, steam division	23,958	29,851
Passenger revenue, electric division	608,648	642,141
Mail revenue	5,513	5,147
Express revenue	41,762	44,836
All other revenues from transportation	7,548	7,275
Revenue from other railway operations	13,880	14,977
Total operating revenues	$1,150,927	$1,217,034
Railway Operating Expenses		
Maintenance of way and structures	$159,151	$182,074
Maintenance of equipment	127,815	136,165
Traffic expenses	1,343	7,931
Power	66,740	65,841
Transportation expenses	351,808	350,364
General expenses	69,944	73,482
Total operating expenses	$782,803	$815,859
Net revenue from railway operations	$368,123	$401,175
Railway tax accruals	77,012	73,627
Railway operating income	$291,111	$327,547
Miscellaneous operations (Sacandaga, N. Y., summer resort)—income	9,146	16,653
Operating income	$300,258	$344,201
Non-operating income	87,006	72,121
Gross income	$387,264	$416,322
Deductions from gross income other than interest charges	61,402	65,112
Balance (available for interest charges)	$325,861	$351,210
Interest charges	324,500	319,799
Net income (available for dividends)	$1,361	$31,411
Total dividends for year (preferred stock)	30,000	30,000
Balance to profit and loss	*$28,638	$1,411

*Deficit—1927

Permission Sought to Abandon Massillon Service

After approximately 30 years of operating in Massillon, Ohio, the Northern Ohio Power & Light Company has filed application with the City Council to abandon its entire city service. Following repeated loses on its Massillon lines it now feels it can no longer continue such rail losses.

The ordinance, which has had its first reading, provides that the company shall be relieved from operation on North Mill from the company's freight house to Cherry Street; Cherry from Mill to Akron Street; Akron from Cherry to north corporation line; West Main from Erie to west corporation line; Wooster from West Main to west corporation line. The company agrees to re-lay the pavement where rails are removed so that the streets where rails are shall be as good as the balance of the street. Provision is also made for the removal of the suburban line between Massillon and East Greenville.

The last car line to be abandoned was the one between Canton and North Canton. These tracks have been removed from the highway. This action was taken for the reason that the company felt it could not shoulder the paving burden. At the same time passenger service was discontinued between Canton and Akron. Bus operation succeeds the rail abandonment.

Sale of Buffalo Interurban Meets with Protest

Opposition has developed to the sale of the right-of-way of the Erie County Traction Company, an interurban line operating out of Buffalo, to Erie County for $125,000. Senator Hickey sponsored the bill passed by the state legislature and signed by Governor Smith, authorizing the Erie County Board of Supervisors to purchase the property. The county will not buy the rails, ties, rolling stock or other equipment. The towns of Hamburg, Orchard Park, Ebenezer and Gardenville say nothing would be gained by the purchase of the railway's right-of-way which originally was acquired by the railway for $68,500. U. L. Upson, who built the line 28 years ago, also is opposing the sale, saying the scrapping of the line would affect business and property owners along the route.

The opposition to the sale will test the constitutionality of the act in the courts. Protest meetings are being held in all communities affected by the pro-

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posed scrapping of the line. Bondholders of the road, represented by New York interests, have joined in the opposition. Richard Persons, president of the East Aurora Bank, is president of the Erie County Traction Company.

Suspension on Buffalo Line Approved

The International Railway, Buffalo, N. Y., surrendered its franchise for the operation on cars in Kenmore Avenue, a distance of about 1,300 ft., and has removed its tracks from the street so there will be no more competition between the Kenmore trolley line and the Delaware Avenue bus line which also serves the village of Kenmore, a residential suburb just north of the Buffalo city line. The company has built a new loop at the end of the Kenmore line at the Buffalo city line. By abandoning this part of the route, the company will reduce its running time on the Kenmore line by almost ten minutes.

The Public Service Commission approved on Aug. 6 this declaration of abandonment on Kenmore Avenue.

Preliminary Dealings on California Cable Acquisition

Negotiations for the proposed acquisition of the California Street Cable Railroad by the city of San Francisco were started recently at a conference between members of the Board of Supervisors and President James W. Harris of the cable lines. At the conclusion it was agreed to co-operate with officials of the company in speeding up valuation proceedings.

Recently the finance and public utilities committee of the Board of Supervisors approved an ordinance paving the way for the acquisition by the city of the Market Street Railway and the California Street Cable Railroad and their eventual consolidation with the Municipal Railway.

Would Abandon Line in Johnstown

The Fonda, Johnstown & Gloversville Railroad and the Johnstown, Gloversville & Kingsboro Horse Railroad, the latter company's railroad being leased to the first-named company, have applied to the Public Service Commission for permission to approve abandonment of part of its route in the city of Johnstown, N. Y. Both companies have adopted resolutions calling for such abandonment. The companies state in their petition that business on this line has been decreasing yearly and that the company's franchise to operate upon West Main Street, west of Market Street and upon William Street has no value. A public hearing will be held by the commission.

Encouraging Report on Toledo's Unified System

Results of the first month of operation of the Community Traction Company, Toledo, Ohio, under the new transit ordinance which virtually gave the company a monopoly of bus and street railway business in Toledo "were encouraging in every respect" according to the report of Commissioner E. L. Graumlich to the street railway board of control, at their meeting Aug. 15. He said the revenues were increased by the elimination of competition and expenses were reduced as a result of the lower power rate, reduced interest charges, and economies resulting from a unified system.

In the 27 days of July that the new plan was effective the total revenue for the company was $261,538, compared with $225,604 for a similar period last year. There remained a surplus of $12,135 after all provisions of the Milner ordinance had been cared for. In a similar month last year there was a deficit of $46,296. Due to elimination of the Dorr-Palmwood bus line and better industrial conditions street car business showed an increase. There were 2,928,511 revenue passengers carried in July this year compared with 2,915,651 in July, 1927. Total coach revenue was $39,677, compared with $17,435 for a similar period last year.

The last month's operation under the old plan with four additional days showed $14,852 surplus to the stabilizing fund. There were 3,949,664 revenue passengers carried in this period.

The Community Traction Company became on July 5, the sole operator of the public transportation under a new transit ordinance under which the company is granted a virtual monopoly of the railway bus business for at least five years. The measure provides for rehabilitation of the system and the carrying out of a general city improvement program involving a number of new paving projects. Mayor William T. Jackson was presented with a check for $267,769 representing a paving claim against the railway dating from Feb. 1, 1921, with interest from that date at 6 per cent, and another check for $10,000, partially to reimburse the city for expenditures in the making of transit surveys, was presented by J. Frank Johnson, vice-president and general manager of the Community Traction Company, in the presence of company counsel and E. L. Graumlich, street railway commissioner.

About $70,000 was paid by the company to independent bus operators for equipment purchased. Many of the buses were appraised at $1,600 to $2,000 in the negotiations by which several of the lines were purchased.

Although referendum petitions were circulated by friends of the independent bus operators they were not filed with the city and no challenge has been made to the new plan of operation. Purchase of the principal lines practically eliminated what little opposition there was to the new transit plan. While the company has purchased nearly 40 used buses in the negotiations for independent lines only a few will be serviceable and during the remainder of the year probably 50 new buses will be purchased and put into service.

Would Dismiss Indianapolis & Cincinnati Suit

Dismissal of the suit for a receiver for the Indianapolis & Cincinnati Traction Company, owned by the Indianapolis & Southeastern Traction Company, has been sought in a petition filed in Federal Court by Frederick H. Kelly of Mattoon, Ill., who was plaintiff in the original receivership suit. The suit was heard by Judge Baltzell in Federal Court several months ago, but decision was withheld when both parties agreed to attempt a settlement out of court. At that time Charles T. DeHore and L. E. Eastman, financiers, who were bidding for receivership purchase of the traction company, informed the court that they would buy the preferred voting stock of the Indianapolis & Cincinnati Car Trust Equipment Company, which had been created by the traction company to provide it with rolling stock and power station equipment.

Since the hearing, the two men have bought approximately 95 per cent of the A series of the preferred stock of the equipment company and all of the B series of preferred stock at $45 net to the stockholders, according to Donald L. Smith, attorney. Mr. Kelly held 70 shares of the A series, which have been bought by the new owners. His suit for a receiver for the equipment company alleged that the Indianapolis & Cincinnati had failed to pay dividends on the equipment company's $970,504 preferred stock.

Indianapolis Company Appeal Dropped

An appeal by the Indianapolis Street Railway against the unfavorable decision in the Indianapolis & Cincinnati Traction Company receivership proceedings, pending in the circuit court at Rushville, Ind., for the last two years, has been dropped, it was learned from Will H. Latta, attorney for the street railway. The Indianapolis company had filed a claim for track rentals when the receivership was begun. Judge William M. Sparks denied the claim. It was said that more than 400 pages of the appeal transcript had been prepared. The decision to drop the appeal was made when it was learned there were no funds with which to pay the claims. The only act remaining now to close permanently the litigation of the traction company, the filing of the final receiver's report by Will M. Frazee, receiver, probably will take place shortly.

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Personal Items

C. R. McMahon Fills New Post in Oakland

C. R. McMahon, who has been serving in the capacity of assistant to W. P. Jackson, superintendent of equipment, has been appointed master mechanic in charge of the mechanical department of the Key System Transit Company, Oakland, Cal., a newly created post. The position of superintendent of equipment has been abolished.

Mr. McMahon went to Oakland in July a year ago. He had formerly served as superintendent of equipment with the Des Moines City Railway, Des Moines, Iowa. His long career in railroading, beginning with the Beaver Valley Traction Company was reviewed in ELECTRIC RAILWAY JOURNAL, issue of July 16, 1927.

G. B. Avery Succeeds C. R. Jackson in Seattle

Clark R. Jackson has resigned as superintendent of public utilities of Seattle, Wash. Formerly state tax commissioner, his appointment as superintendent of public utilities of Seattle in 1923 was made by Mayor E. J. Brown and approved by the City Council.

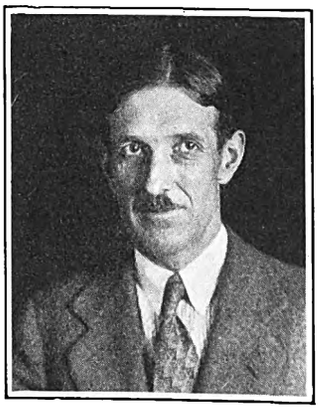
G. B. Avery, recently serving as assistant supervisor of the state Department of Labor and Industries, and formerly a government electrical engineer, was named to succeed Mr. Jackson.

J. W. McCloy Joins *Journal* Staff

J. W. McCloy has joined the staff of ELECTRIC RAILWAY JOURNAL as assistant editor. Mr. McCloy by training and experience is unusually well qualified for work on the JOURNAL for he has wide contact with the industry's problems in several sections of the country, and in addition to actual operating experience has conducted many expert investigations embracing traffic studies, the prospects of the interurban, and the operation of buses in city, suburban and interurban service.

Utility work attracted Mr. McCloy as long ago as 1900 when he was first employed by the Seattle Electric Company, then under the management of Stone & Webster. After several years in the transportation department of the company he was sent to Paducah, Ky., also under Stone & Webster management. Failing in health, he withdrew for a time from the electric railway business and spent the winter of 1908 in El Paso in the service of the government. Returning to Seattle he again entered the employ of the Seattle Electric Company but left the service in 1909 to go with the city of Seattle as car service inspector in the Department of Public Utilities. About this time he first broke into print in the technical press with an article in which he discussed the matter of developing standards of service. As it turned out this was a forerunner of a number of contributions on transportation subjects.

When the United States entered the war and was confronted with the problem of transporting war workers, particularly shipyard men, Mr. McCloy entered the employ of the United States Shipping Board as special agent for transportation, in which capacity he made reports and surveys of car service and general transportation service to shipyards and allied industries at Seattle, Tacoma, Portland and the Grays Harbor cities. War over, and Seattle having purchased its local railways, he went for a time with the Seattle & Rainier Valley Railway under Walter M. Brown. In 1922 he accepted a position with the Indiana, Columbus & Eastern Traction Company at Springfield, Ohio, as traffic engineer. In this capacity he made studies of bus operation throughout the southern Ohio territory. For a time he also handled the company's advertising and publicity work. Leaving the Ohio properties in the summer of 1923 Mr. McCloy went as traffic engineer with a group of electric railway companies under the management of Peck-Shanahan-Cherry, Inc., operated out of Syracuse, N. Y. Here his work involved a survey of the surrounding territory with the view of determining the possibilities for the establishment of motor bus and truck lines to be operated in conjunction with the railways. His work has nearly all been such as makes for that intimate contact with transportation over a wide territory that is necessary to qualify a man to interpret and discuss the problems of the industry. Since this is combined in Mr. McCloy with the ability to express his views clearly and concisely in writing, his addition represents a considerable strengthening of the JOURNAL's staff.



J. W. McCloy

Frank D. Comerford, New Head at Providence

Frank D. Comerford—35 years old, Holy Cross graduate and Harvard Law School specialist in utility law—the new president of the Rhode Island Public Service Company, Providence, R. I., operating among other properties the United Electric Railways, represents one of the largest hydro-electric systems in the United States. Quietly and swiftly the New England Power System, for which properties the New England Power Association is the holding company, has grown from its small beginnings in 1909, yet those beginnings stood for the largest development of their kind east of Niagara. If projects now contemplated go through, the system will have the largest hydro development east of the Mississippi excepting only Niagara.

According to the New York *Times*, the new president is not a wordy man, but what he says counts. An example of this was noted in Worcester, Mass., some time after the Worcester Electric Light Company had gone to court to prevent enforcement of a rate reduction ordered by the Massachusetts Department of Public Utilities. In an address Mr. Comerford significantly extolled the work of the commission. How it "had conscientiously balanced the interests of the consumer and of the investor," its policies were "fair and wise," "in no state had regulation been more intelligent," and anyhow the foundation of industrial success is "goodwill and public confidence."

From the outset New England Power has been aggressive. The policy always has stood for expansion and construction. In 1910 it had 32,000 customers, in 1927 about six times that number. The first year the net earnings were less than $1,000,000, in 1927 about $10,000,000. In 1926 the generating capacity in steam and hydro plants was 476,250 hp., completion of a plant then building lifted the total to 536,250 hp., and the undeveloped sites and recent acquisitions probably place the total well over 700,000.

Gradually has this largest system in New England been built up to supply light and energy for some 9,000 square miles of territory, selling through local distributing companies and covering some 250 communities with a population of more than 2,500,000. It was in 1907 that Malcolm G. Chace and Henry I. Harriman, the latter well known for his city-planning studies and until recently president of the association, began their investigations of possible developments on the Connecticut River in southern Vermont. At Vernon, a few miles below Brattleboro, they built the first plant of the present system, with a capacity of 27,000 hp. Business started in July, 1909, and the power was delivered locally or distributed to Gardner, Fitchburg, Clinton and Worcester. The system's high-tension transmission lines now cover a wide diagonal from Vermont and New Hampshire

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across Massachusetts and Rhode Island and most of the current is sold in the two last-mentioned states, although business is done in all New England States except Maine.

The corporate offices of the association are in Boston and the managerial offices are now in Worcester; but three floors of the new Batterymarch Building in Boston have been taken for a mobilization of forces. The chairman of the board of directors is Charles L. Edgar, president of the Boston Edison Company, and the chairman of the executive committee is A. R. Graustein, president of the International Paper Company.

Changes in New York Central Force

A. J. Clarkson succeeds J. A. Carmody who joins Eureka Copper Products Company, New York. F. E. Edwards takes over newly created post

A. J. CLARKSON has been appointed superintendent of electrical equipment of the New York Central Railroad, effective Aug. 1, with headquarters in Grand Central Terminal, New York City. In this capacity he succeeds J. A. Carmody, resigned. With the appointment of Mr. Clarkson the position of general inspector, previously held by him, was abolished and F. E. Edwards was appointed assistant superintendent of electrical equipment, also with headquarters in Grand Central Terminal.

Mr. Clarkson entered the service of the electrical engineering department of the New York Central in New York, on July 1, 1916. While in that department he advanced through the positions of draftsman, inspector and assistant engineer, and on April 23, 1923, was promoted to general inspector in the electric equipment department, where he served as assistant to Mr. Carmody, superintendent of electric equipment, recently resigned.

Mr. Clarkson was born in Bloomington, Ill., on Aug. 4, 1893. He received his elementary school education in the public and high schools of Champaign, Ill., after which he completed a course in railway and electrical engineering at the University of Illinois, Urbana, and received the degree of B. Sc. in railway electrical engineering in June, 1916.

In his new position Mr. Clarkson has charge of the maintenance and operation of the electric locomotives and multiple-unit cars which provide the electric passenger and freight service in the electrified territory of the New York Central in and around New York City.

The post which Mr. Clarkson now succeeds to was ably filled for the past five years by J. A. Carmody, whose resignation was recently announced. Mr. Carmody, who knows the railway and railroad electrification business, went to the New York Central in 1906 as general foreman of car equipment. He had worked on car equipment with the General Electric in different parts of the country. Three years later he left the New York Central pursuing appraisal work with J. G. White & Company and working with the Safety Car Heating & Lighting Company on railway train lighting equipment. His return to the New York Central in 1922 was primarily for the purpose of appraising the traction lines of the New York & Harlem Railroad. When a year later a successor to C. H. Quereau, retired on pension, was in prospect for the position of superintendent of electrical equipment Mr. Carmody seemed to be the logical appointee. Under the scheme of organization at that time he reported to the late E. B. Katté.

Mr. Carmody has become affiliated with the Eureka Copper Products Company as district representative with office in the Grand Central Terminal Building, New York City.

The newly-named assistant superintendent, F. E. Edwards, entered the service of the motive power department of the New York Central at the 72nd Street Roundhouse, New York City, as oiler, on Feb. 2, 1905. On April 1, 1906, he left the New York Central under agreement with the company to get some electrical railway experience prior to the inauguration of its electrical operation. This experience was obtained while working for the Interborough Rapid Transit Company in New York City, and on Oct. 2, 1906, Mr. Edwards returned to the electric equipment department of the New York Central as electrical inspector at Wakefield, N. Y. This position he held until Jan. 1, 1908. At that time he was promoted to foreman at Grand Central Terminal and on Aug. 1, 1928, he received the further promotion to the newly created position of assistant superintendent of electric equipment. Mr. Edwards was born in Cairo, N. Y., on Sept. 10, 1888.

T. B. GOODYER has resigned as general manager of Croydon (England) Corporation Tramways after 22 years' service with the city. Previous to this affiliation he was general manager of Croydon Tramways, the private corporation which was taken over by the city in 1906. He will be retained in a consulting capacity.

JAMES R. CLARK of Bloomington, Ill., has been appointed a member of the Illinois Commerce Commission by Governor Len Small. He had been supervisor of the orders of the commission and had also served as assistant commissioner. He succeeds David H. Jackson, Chicago.

BLAKE R. VANLEER, assistant professor of mechanical engineering in the University of California since 1920, has been appointed assistant secretary of the American Engineering Council, succeeding A. C. Oliphant, who has resigned.

Obituary

CHARLES EDWARD EARLEY, purchasing agent of the Louisville Railway, Louisville, Ky., for the past eight years, died Aug. 13 after an illness of two years. At the beginning of the present year Mr. Earley requested that he be transferred to duties less strenuous. Entering the service at Louisville at the age of fifteen as a trolley boy, he worked his way up to the position of purchasing agent in his 35 years with the company.

A. J. ANDERSON, long identified with the Union Traction Company, Nashville, Tenn., died recently. He entered the employ of the company in 1902 as a section hand and served in turn as conductor, motorman, ticket agent, assistant to the general manager, secretary-treasurer and general manager.

William Edwin Freir

The death of William Edwin Freir, founder and editor of the *Electric Railway and Tramway Journal*, London, on May 18, removed a man who had become personally acquainted with many electric railway officials, not only in England but in many parts of Europe and other continents. In connection with electric railway work many firms and companies sought his expert journalistic assistance. For a number of years he made a practice of attending all important conferences at home and abroad dealing with electric traction, and it was while returning from the Rome Conference that he died. Almost his last editorial work was the publication of a special issue of the *Electric Railway and Tramway Journal* in connection with the International Congress at Rome. Apart from technical journalism, he was a most fluent writer on many subjects, in which his natural talents were helped by his wide reading, constant study, and intimate acquaintance with many leaders of thought and opinion.

Mr. Freir was appointed editor of *The Ironmonger* in London in 1877, remaining in charge of that paper for a period of more than twenty years. In 1897 he retired from business, but after a period of a few months he re-entered journalism, founding a group of papers, including *The Automobile and Carriage Builders' Journal, The Electric Railway and Tramway Journal,* and *The Colonizer*. The conduct of these papers will be continued by his sons.

The following appreciation of the man is taken from an editorial in the paper which he founded:

A fluent writer, a keen observer, a great linguist, a much traveled searcher for news his work was recognized everywhere as authoritative and remarkably accurate. He was an assiduous attendant at tramways congresses at home and abroad, and his winning personality and cheery presence will be greatly missed at these gatherings for years to come. The loss caused by his death will be sorely felt by countless friends, but he has left behind memories of inspiration to those who follow him.

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Track Market Continues Active

Several Properties Buy Buses and Line Department Materials. Extensive Improvements Planned in El Paso, Seattle and Washington

RECENT purchases of track material and contemplated track jobs continue to be large, according to reports received this week from a number of electric railways. The Washington Railway Electric Company, Washington, D. C., has ordered 250 tons of section 97-420 wheel rail, 70 tons of section 67-34 slot rail, 900 cast-iron track yokes, 1,000 hook bolts 1 x 3 in., 500 hook bolts $\frac{7}{8}$ x 3 in., 2,000 slot bolts $\frac{3}{4}$ x 3 in., 500 21$\frac{1}{2}$-in. tie rods, and 700 22-in. tie rods. Twenty-five thousand steel tie plates, 500 steel base plates and 2,500 pairs of channel plates have been ordered by the United Railway & Electric Company of Baltimore.

The Worcester Consolidated Street Railway, Worcester, Mass., has completed the reconstruction of 2,303 ft. of track on Grove Street, and a new turnout has been installed and track reconstructed on Vernon Street. The company has also purchased a type 20 Ingersoll-Rand air compressor, mounted on a Chevrolet truck. This company has filed a petition with the City Council, asking permission to relocate tracks on Chandler Street and to be allowed to construct and maintain conduit in Chandler Street from Main to Wellington Street. The Chicago Rapid Transit Company, Chicago, Ill., is working on its elevated tracks at Evanston, which will give the company elevated tracks for almost the entire length of its north side division.

An order has been placed by the Interborough Rapid Transit Company, New York, N. Y., with the Union Switch & Signal Company for a nineteen-lever electro-pneumatic interlocking machine, for installation at Freeman Street, and also for alternating-current block signaling materials for its White Plains elevated line from 149th Street and Third Avenue to West Farms, consisting of 90 color light signals, 80 electro-pneumatic automatic train stops, 275 relays with necessary switch movements, transformers, instrument cases, and other attendant apparatus. New York Rapid Transit Corporation, New York, N. Y., has ordered material for automatic block signaling on the Williamsburgh Bridge.

As a result of a recent hearing, it is virtually assured that the Seattle Municipal Street Railway, Seattle, Wash., will extend its car line about $\frac{1}{2}$ mile from its present terminus at Beacon Avenue and Spokane Street to Columbian Way. It is estimated that the cost of this extension will be about $46,620, and to carry the extension on to Graham Street, which is being asked for by a number of residents of that district, would cost about $94,000.

Fifteen 33-ft. tubular steel poles, and 50 30-ft. tubular steel poles have been ordered by the United Railway & Electric Company of Baltimore. The Washington Railway & Electric Company, Washington, D. C., has ordered twenty 35-ft. cedar poles, 100 40-ft. cedar poles, and 20 45-ft. cedar poles, 24 30-ft. tubular steel poles and fittings, and 23 28-ft. tubular steel poles and fittings. This company has also ordered 200 porcelain insulators, 50 galvanized hangers, 100 trolley ears, and two section insulators.

The Washington Railway & Electric Company is equipping eighteen cars with door-opening treadles, four cars with manually operated doors, four cars with flexolith floors, and four cars with de luxe leather-covered seats. This company has also ordered 200 22-in. cast-iron car wheels, 50 30-in. steel wheels, and 50 31-in. steel wheels. Seattle Municipal Railways has purchased five new 29-passenger heavy-duty buses at a cost of $38,000. The Community Traction Company, Toledo, Ohio, has ordered three Mack four-cylinder 29-passenger city type buses. The Groton & Stonington Traction Company, Norwich, Conn., has purchased ten Twin Coach parlor cars. The Iowa Southern Utilities Company, Centerville, Iowa, has purchased four Mack four-cylinder 25-passenger city type buses, and the Iowa Railway & Light Corporation, Cedar Rapids, Iowa, has supplanted its car system in Marshalltown, Iowa, with seven Yellow Coaches of the 23-passenger street car type. The New Haven & Shore Line Railway, Guilford, Conn., expects in the very near future to purchase additional coaches for its bus line between Guilford and Saybrook.

The purchase of a bolt-threading machine is contemplated by the Washington Railway & Electric Company. This company has also ordered two 300R remote-control electric-operated gasoline dispensing units. The Twin City Motor Bus Company, St. Paul, Minn., controlled by the Twin City Rapid Transit Company, will enlarge its bus garage at 164 West Fifth Street by adding a second story to cost $15,000. The Boston & Worcester Street Railway, Framingham, Mass., has remodeled its Marlborough carhouse for the repair and storage of buses. The equipment which was formerly there is now in the Framingham carhouse.

Proposed $1,861,003 Rehabilitation for Seattle

In his report advocating a reconstruction program of $1,861,003 on the municipal railway system of Seattle, Wash., acting Superintendent of Railways Roy E. Fürse urges that the street car elevated trestle along the waterfront from Spokane Street to Occidental Avenue be abandoned and cars run over to First Avenue South. He recommends the extension of the Spokane Street elevated over to First Avenue South on a structure to cost $43,375 and also rebuilding the present structure on Spokane Street from the waterway east to Marginal Way at a cost of $53,814. Other items include 200 new street cars, paving between tracks on California Avenue and other streets, a new street car line out 35th Avenue Southwest from Avalon Way to the city limits to replace the existing bus line, and a single-track extension up Gatewood Hill on California Avenue from West Myrtle Street to West Monroe Street. In addition, it is proposed to spend $168,815 for a street car line up Admiral Way from Spokane Street to 63 Avenue Southwest.

$400,000 Improvements for El Paso

Improvements to cost $400,000 have been announced by El Paso Electric Company, El Paso, Tex., which includes $250,000 for a new Santa Fe Street bridge and $150,000 for extensions and work in Juarez, Mexico. Car lines will be extended to various parts of city. The bridge is to be of concrete.

Washington Track Improvements

Track improvements involving a total expenditure of $230,682 are being pushed to completion by the Washington Railway & Electric Company, Washington, D. C. This includes the re-laying of 1 mile of track of the conduit type on the Eleventh Street line, six blocks of new track on Connecticut Avenue, and some new special curved track work around Dupont Circle. The company is also making preparations to re-lay a mile of its overhead trolley track on Wisconsin Avenue. An expenditure of $4,000 is being made on Georgia Avenue in removing center trolley poles and substituting side poles.

Cleveland Adopts Girder Rails

After using the T-rail for about fifteen years, the Cleveland Railway, Cleveland, Ohio, has adopted the American Electric Railway Association standard section girder or groove rail.

The change was made on the recommendation of H. H. George, engineer, who came to the Cleveland Railway organization several months ago from the Public Service Railway of New Jersey.

The Cleveland City Council recently authorized the railway to buy 600 tons of girder rails from the Bethlehem Steel Company and 1,500 tons from the Lorain Steel Company.

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Ten Cars Being Built for Pacific Electric

Pacific Electric Railway, Los Angeles, Cal., expects delivery by Oct. 15 of its ten two-man, motor, passenger cars ordered from the St. Louis Car Company. These cars are of the double-end, double-truck city type.

The length of each car is 52 ft. 2 in., the width is 9 ft. 1¾ in. and the weight is 57,800 lb. The bodies are of all-steel construction with arch-type roof and center sliding and folding end doors. Twenty-two cross-seats and eight longitudinal seats are provided. The exterior is finished in bandarilla red and the interior trim is mahogany. Each truck is equipped with two motors, 26-in. cast steel wheels and roller journal bearings. Additional information is given in the accompanying specifications.

Builder of car body	St. Louis Car Co., St. Louis, Mo.
Date of order	May 1, 1928
Date of delivery	Oct. 15, 1928
Weights:	
Car body	29,000 lb.
Trucks	15,360 lb.
Equipment	13,440 lb.
Total	57,800 lb.
Bolster centers	29 ft.
Length over all	52 ft. 2 in.
Length over body posts	48 ft. 2 in.
Truck wheelbase	6 ft.
Width over all	9 ft. 1¾ in.
Height, rail to trolley base	10 ft. 11¾ in.
Window pos. spacing	30 in.
Body	All steel
Air brakes	Westinghouse type S.M.E.
Axles	4½ in. diameter (4¼x8 in. journals)
Car signal system	Faraday bells and buzzers
Compressors	Westinghouse type DH-16
Conduit	Metal
Control	Westinghouse type HL, 600 volt
Couplers	Westinghouse type K-1-A
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Hunter illuminated and non-illuminated
Door mechanism	Consolidated Car Heating Company
Doors	Sliding center doors, folding end doors
Finish	DuPont
Floor covering	Flexolith
Gears and pinions	Nuttall helical, grade BP
Glass	A.A. double strength
Hand brakes	Miners ideal safety
Heat insulating material	Three-ply Salamander Hairfelt
Heaters	Consolidated Car Heating Company, type 1522-T
Headlights	Crouse Hinds type 2
Headlining	Agasote
Interior trim	Mahogany
Journal bearings	Melcher Hyatt roller
Journal boxes	Melcher Hyatt equipped
Lamp fixtures	Safety Car Fixtures E.S.S. Company
Motors	Four Westinghouse No. 532-AR
Painting scheme	Bandarilla
Registers	Ohmer
Roof type	Arch, "Neal" construction
Roof material	16 in. O.H. sheet steel
Safety car devices	Electric Pneumatic door Equipment C.C.H. Co.
Sash fixtures	"Rex" removable brass sash and fittings
Seats	Heywood-Wakefield type 327-M
Seat spacing	30 in.
Seating material	Brown Spanish leather
Slack adjusters	Westinghouse type J
Steps	Folding step at end exit only
Step treads	Feralun
Trolley catchers	"Eclipse" No. 2
Trolley base	Two US-13-E
Trolley wheels	Kalamazoo 5 in. No. 23
Trucks	Commonwealth, four-wheel cast steel
Ventilators	Consolidated Car Heating Company Automatic
Wheels	Griffin, F.S.C.—S.P. diameter 26 in.
Wheelguards	Eclipse type C

Cleveland Terminal Electrification Plans

Passenger trains in and out of Cleveland will be handled by electric locomotives after Jan. 1, 1930. The newly electrified zone is to include about 16 miles of multiple track route, extending from Linndale on the west through the new terminal station to Collinwood on the east. A portion of this electric zone will be on the right-of-way of the New York Central and Big Four lines, and the remainder on the Nickel Plate.

The power distribution will be of 3,000 volts direct current, with catenary overhead construction. The motive power for the initial operation will include twenty 204-ton, geared-type, passenger locomotives.

These locomotives are being built jointly by the American Locomotive and the General Electric companies. Each unit will weigh 204 tons, with 150 tons on the driving axles. The six-geared driving motors will have a total rating of 2,900 hp. at the one-hour rating, and 2,465 hp. at the continuous rating. At each end of the locomotive is a two-axle guiding truck designed to insure successful operation at high speeds. The total length of the locomotive is 80 ft., while the length of the cab is only 52 ft. The running gear includes two 3-axle Commonwealth Steel trucks coupled by an articulated joint and two 2-axle guiding trucks, each carrying a weight of about 27 tons.

The motors are of the usual design for articulated truck type locomotives, being carried at one side on the driving axle and at the other on the transom through a spring nose suspension. Two cushion-type gears are provided for each motor, one at each end of the shaft meshing with a pinion on each end of the motor. The gear ratio is 79 : 29. The control is designated as PCL non-

Battery Men to Meet

Final arrangements are now being made by the program committee of the National Battery Manufacturers Association for the annual convention to be held at the Ambassador Hotel, Atlantic City, N. J., on Thursday and Friday, Sept. 20 and 21.

A comprehensive business program is being planned including many papers of technical and general interest by prominent men in the industry. All persons interested in the battery manufacturing industry are invited to attend this convention.

E. H. Gerberding Assistant Treasurer of Westinghouse

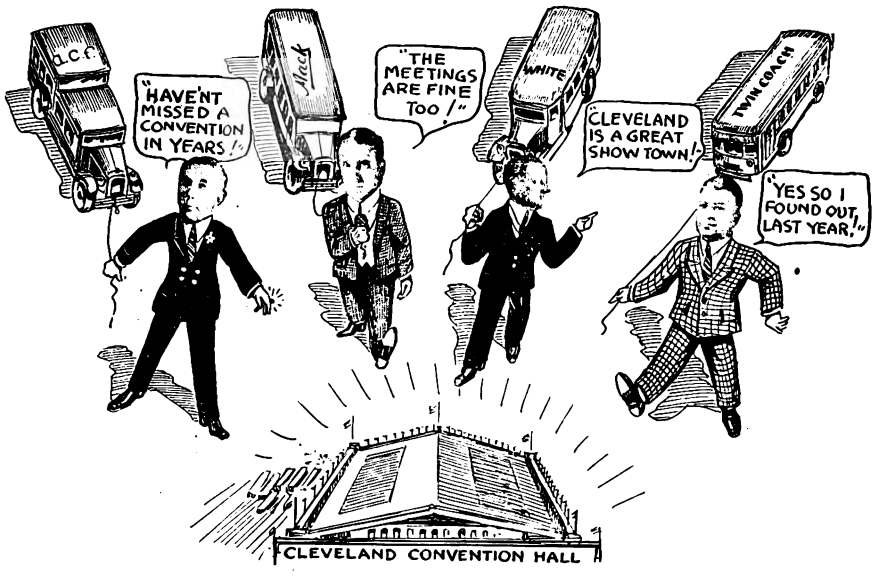
E. H. Gerberding, of Pittsburgh, Pa., has been promoted to the position of assistant treasurer of the Westinghouse Electric & Manufacturing Company. As a seventeen-year-old boy he began work in the company's treasury department 28 years ago, and has been continuously employed in the same department since that time.

American Brown Boveri Buys Packard Transformer

The transformer division of the Packard Electric Company, Warren, Ohio, has been purchased in its entirety by the American Brown Boveri Electric Corporation. The transformers made by the Packard company will be continued in all types and sizes under the established trademark "Packard."

The American Brown Boveri company states that the manufacturing and engineering facilities will be consolidated with those of its other departments at the Camden, N. J., plant. It is understood that N. A. Wolcott, president of the Packard Electric Company, will become affiliated with the American Brown Boveri Company.

Exhibitograph No. 17



The Exhibitograph Spotlight continues to find the exhibit committee voting "greatest" and "best" for this year's convention

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automatic, and includes provision for the operation of two or more locomotives in multiple unit. The master controller has a main handle, a reverse handle and a field control handle, with suitable interlocking to prevent improper handling. The control provides a total of nine running positions and 33 resistance steps.

The main circuits are protected by a high-speed circuit breaker which opens ahead of the main contactors. Current at 1,500 volts is supplied by a 3,000/1,500 volt dynamotor for driving the blowers and some other auxiliary circuits. Low voltage power for control, lights, etc., is taken from a control generator mounted on an extension of the dynamotor shaft. This generator supplies about 40 volts for charging a sixteen-cell Exide Ironclad storage battery. The auxiliaries include two 1,500-volt motor-driven air compressors and two 1,500-volt motor-driven blowers. Electric heaters and some of the other equipment are also operated from the 1,500-volt supply.

The train heating equipment on each unit will include an oil-burning steam boiler with suitable tank for oil and water, similar to the equipment now being used on the passenger locomotives operated by the New York Central Railroad at New York.

The dimensions, weights and ratings of the locomotive are:

Length inside knuckles	80 ft.
Length over cab	52 ft.
Height over cab roof	13 ft. 2 in.
Height over trolley locked down	14 ft. 10 in.
Rigid wheelbase	15 ft.
Total wheelbase	69 ft.
Total weight	408,000 lb.
Weight on drivers	300,000 lb.
Dead weight per driving axle	11,800 lb.
Weight per guiding axle	27,000 lb.
Horsepower, six motors, continuous rating	2,465
Horsepower, six motors, one-hour rating	2,900
Tractive effort, continuous rating	23,600 lb.
Tractive effort, one-hour rating	29,200 lb.
Speed, continuous rating	39.2 m.p.h.
Speed, one-hour rating	37.3 m.p.h.
Tractive effort at 30 per cent coefficient	90,000 lb.
Maximum speed	70 m.p.h.
Weight of train handled	1,275 tons

Purchases and Stores Convention Exhibit

The Purchases and Stores Division of the American Electric Railway Association will exhibit at the Cleveland Convention in space No. 200 a delineascope, displaying views of stores building, stores layout and material handling devices.

No one realizing the potential savings to be made by the use of up-to-date stores practices can afford to miss visiting this exhibit. For the first time it is possible to assemble and show such views obtainable from 34 utilities, large and small in this country, Canada and Mexico. The use of devices such as escalators, chutes, cranes, magnets and electric lift trucks will be shown.

In addition there are displayed various sets of scenes of central forms, as recommended in the Manual. Members of the purchases and stores committee consider it their duty and privilege to discuss purchasing and stores problems with any one visiting the exhibit.

ELECTRIC RAILWAY MATERIAL PRICES—AUG. 14, 1928

Metals—New York

Copper, electrolytic, cents per lb	14.54
Lead, cents per lb	6.2
Nickel, cents per lb., ingot	35.
Zinc, cents per lb	6.6
Tin, Straits, cents per lb	48.25
Aluminum, 98 or 99 per cent, cents per lb.	23.90
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	53.00
General service	31.50

Bituminous Coal

Smokeless Mine Run, f.o.b. vessel, Hampton Roads, gross tons	4.15
Somerset mine run, f.o.b. mines, net tons	1.825
Pittsburgh mine run, Pittsburgh, net tons	1.75
Franklin, Ill., screenings, Chicago	1.5
Central, Ill., screenings, Chicago	1.475
Kansas screenings, Kansas City	2.175

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, ⅝ in. and larger, cents per lb	2.80
Tie plates (flat type), cents per lb	2.15
Angle bars, cents per lb	2.75
Rail bolts and nuts, cents per lb	3.90
Steel bars, cents per lb	1.875
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.40

Hardware—Pittsburgh

Wire nails, base per keg	2.55
Sheet iron (24 gage), cents per lb	2.625
Sheet iron, galvanized (24 gage), cents per lb.	3.45
Galvanized barbed wire, cents per lb	3.20
Galvanized wire, ordinary, cents per lb	3.

Waste—New York

Waste, wool, cents per lb	18.
Waste, cotton (100 lb. bale), cents per lb.:	
White	17.25
Colored	13.5

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb	10.1
White lead in oil (100 lb. keg), cents per lb.	13.75
Turpentine (bbl. lots), per gal	$0.58
Putty, 100 lb. tins, cents per lb	5.50

Wire—New York

Copper wire, cents per lb	16.625
Rubber-covered wire, No. 14, per 1,000 ft.	5.3
Weatherproof wire base, cents per lb	17.125

Paving Materials

Paving stone, granite, 5 in., f.o.b. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd., f.o.b.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd., delivered	3.375
Cement, Chicago consumers' net prices, without bags, f.o.b.	2.05
Gravel, ¾-in., cu.yd., delivered	3.375
Sand, cu.yd., delivered	2.125

Old Metals—New York and Chicago

Heavy copper, cents per lb	12.375
Light copper, cents per lb	11.
Heavy yellow brass, cents per lb	7.25
Zinc, old scrap, cents per lb	3.25
Lead, cents per lb. (heavy)	4.67½
Steel car axles, Chicago, net ton	$15.75
Cast iron car wheels, Chicago, gross ton	12.875
Rails (short), Chicago, gross ton	15.50
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	6.25

Economic Changes Expected

Midsummer of 1928 probably marks the end of an economic era in the United States, the termination of a five-year period during which this country has been the temporary custodian of more than its share of the world's stock of monetary gold, according to the Cleveland Trust Company. As we pass into the second half of 1928 we appear to be leaving a period in which credit has vigorously sought employment, and entering one in which enterprises must compete for credit. The outlook is changed, and it is one to which we have become unaccustomed.

Preliminary figures on electrical energy consumption for July indicate that production has continued on a high plane, considerably above that of this time last year. Iron and steel, automobile and metal working activities are being maintained on an unusually high plane for this season of the year. There is every reason to believe that a high rate of activity will be continued at least until the fall months.

ADVERTISING LITERATURE

Superheater Company, New York, N. Y., has issued bulletin No. T-1 entitled, "The Elesco Superheater for Power Plants." This catalog describes and illustrates the design, construction and application of the Elesco superheater to power plants.

American Steel & Wire Company, Chicago, Ill., has issued a new 167-page rail bond handbook. It gives complete general descriptions and applications of Arcweld rail bonds, Arcon rail bonds, Flameweld rail bonds, stud terminal rail bonds and soldered rail bonds as well as technical data, descriptions of bonding appliances and a complete general catalog.

Fusion Welding Corporation, Chicago, Ill., has issued bulletin 128 entitled, "The Influence of Carbon in Steel Welding Rods" the first of a series which it plans on distributing every four to six weeks. Each bulletin will deal with some particular welding question and on which the work of its research department is able to throw light. Welders, plant superintendents and engineers interested in welding can receive these bulletins regularly by registering their names with the research department of the Fusion Welding Corporation.

Sherman Corporation, New York, N. Y., has issued a booklet entitled "What About Merger?" This report is a study of the current trend towards mergers and consolidations and is an analysis based on a digest of typical opinions received from more than 200 commercial and investment bankers.

Sullivan Machinery Company, Chicago, Ill., has just published bulletin 81-U descriptive of the Sullivan K-3 concrete breaker and bulletin 81-T describing the Sullivan L-8 rotator drill.

Link Belt Company, Chicago, Ill., has issued a new crawler crane book No. 995. It covers the complete Link Belt line of gasoline, diesel and electric crawler cranes of capacities up to and including the 2-cu.yd. heavy duty machine as well as standard locomotive cranes.

Roller-Smith Company, New York, N. Y., has issued a bulletin No. 300 descriptive of portable, direct reading, slide wire ohmmeters, types com, gom and som.

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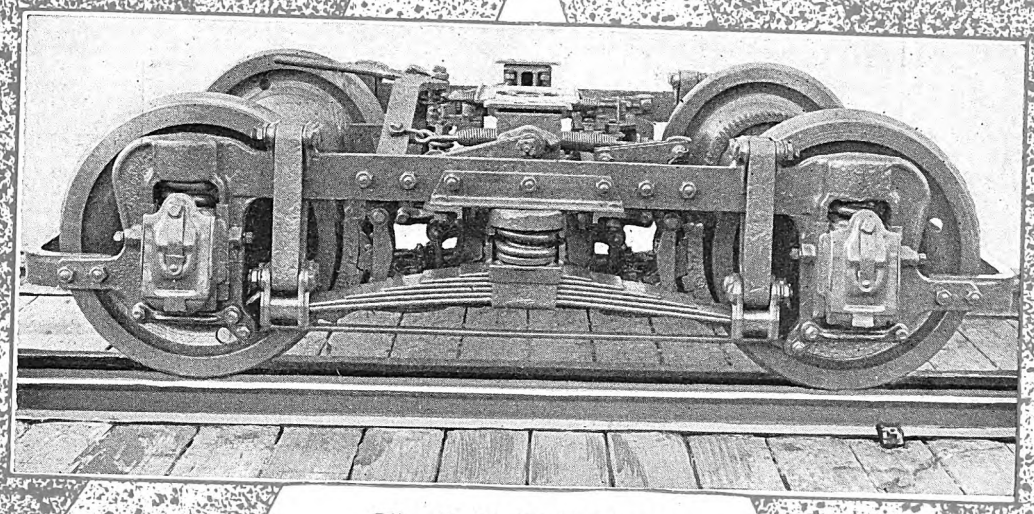

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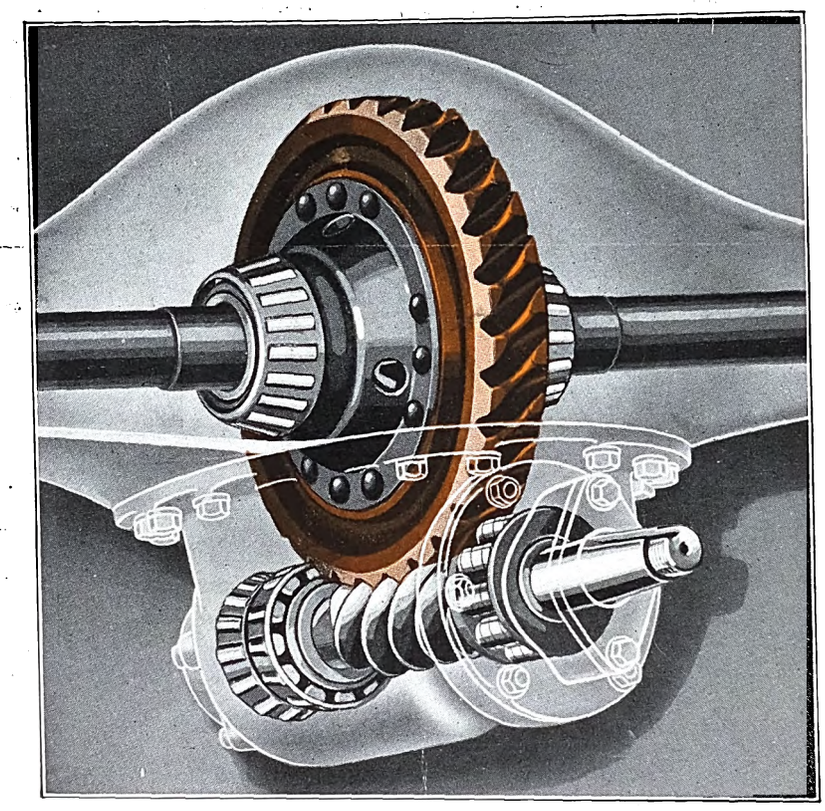

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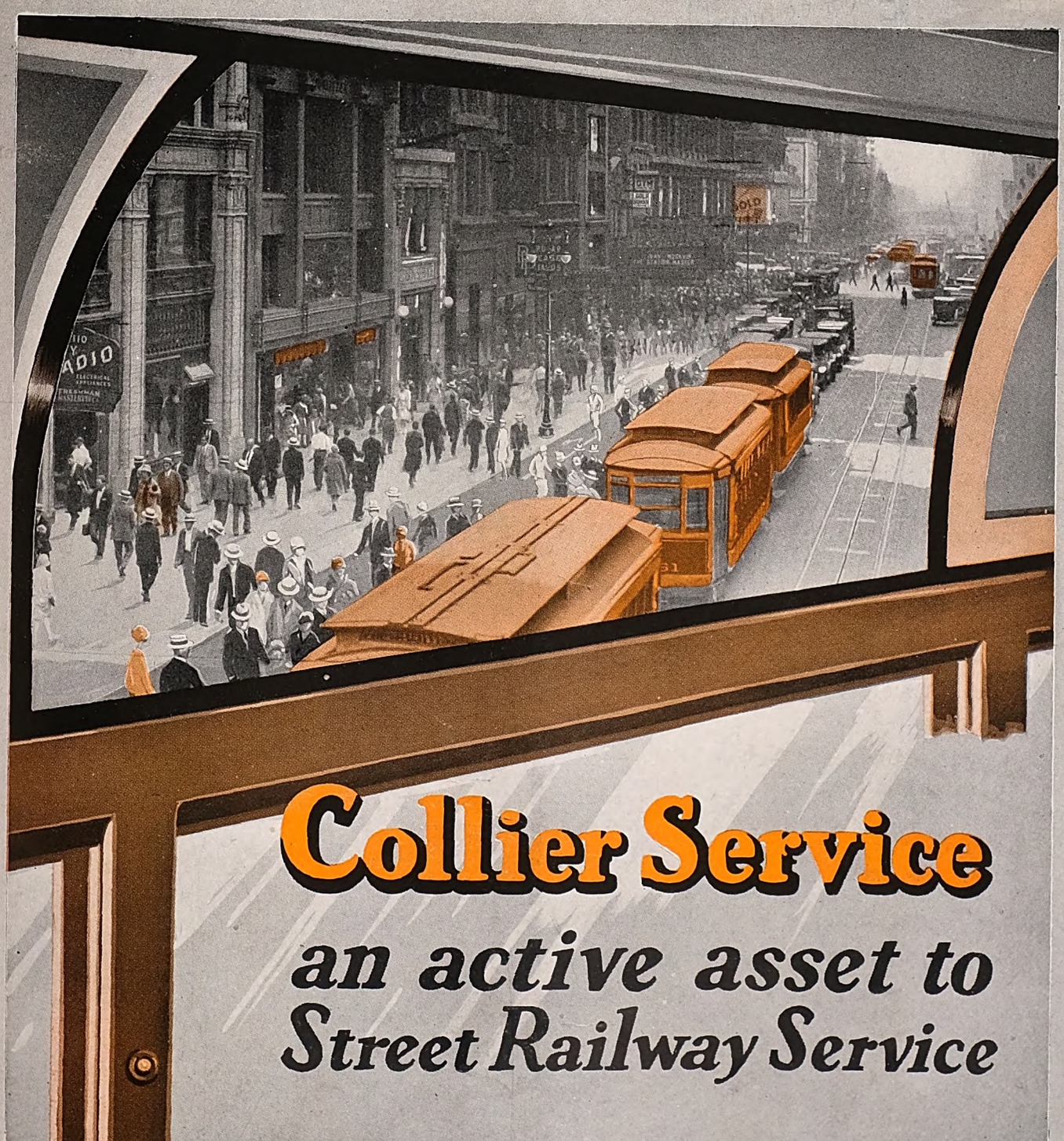

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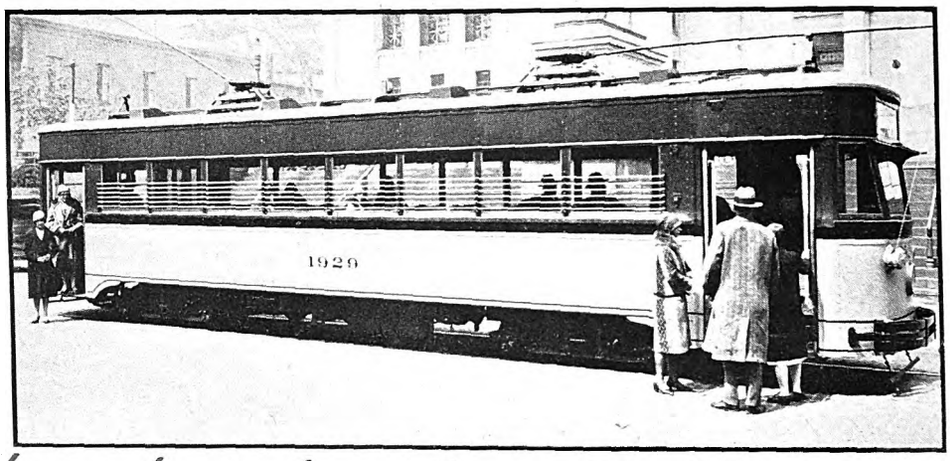

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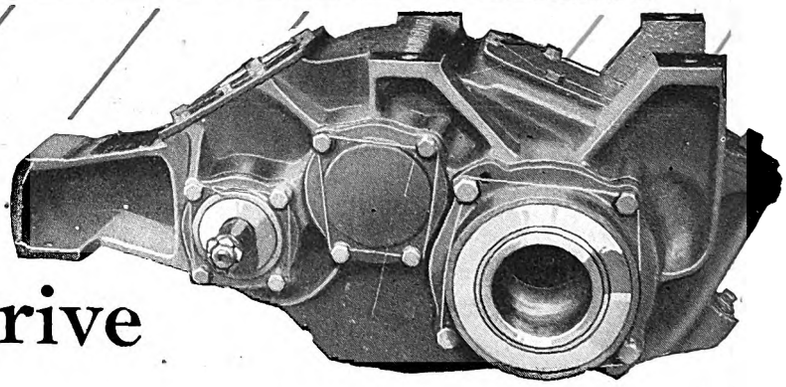

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. McGRAW, *President*

Consolidation of Street Railway Journal and Electric Railway Review
CHARLES GORDON, *Editor*

LOUIS F. STOLL, *General Manager*

Volume 72 New York, Saturday, August 25, 1928 *Number 8*

Mr. Smith Pre-Judges a Great Industry

LAST week the JOURNAL, in commenting on Mr. Hoover's acceptance speech of Aug. 11, expressed the hope that this presidential campaign would be characterized on the part of both candidates by expressions of sound policy relative to economics and business. For once it seemed possible that the country might be spared those seeds of suspicion, unfairness and persecution against great industries which are frequently sown by candidates seeking popular indorsement.

But unfortunately, when the returns at the ballot box are an immediate objective, the temptation is strong to cater to the prejudices of those who are all too ready to believe that bigness alone in business is evidence of sinister motives and public exploitation. To cry dishonesty and lack of patriotism against those who have built great enterprises is always popular. And the candidate who resorts to this expedient is prone to accept as a remedy the theory that to put government further into business under one disguise or another insures greater honesty and regard for the public interest than is possible by private enterprise. Somehow the fact that the operations of public utilities under private initiative are subject to close public scrutiny and regulation is frequently overlooked. There is a deadly parallel between the utterances of the politician seeking votes and the screaming newspaper seeking circulation. The following paragraph in Mr. Smith's acceptance speech, delivered on Aug. 22, would fit appropriately on the editorial page of the typical yellow journal:

"No more dishonest or unpatriotic propaganda has ever been seen in this country than that disclosed by the investigation into the methods of certain utility corporations. Private corporations to gain control of public resources have procured the writing of textbooks for the public schools; have subsidized lecturers pretending to give to the country their own honest and unbiased advice; have employed as their agents former public officials, and have endeavored to mislead public opinion by the retention of the services of leaders of the community in various parts of the country. Highly-paid lobbyists penetrated into every state and into the legislative halls of the nation itself."

Thus Mr. Smith passes judgment upon the utility industry, before the Federal Trade Commission, duly constituted by the nation whose chief executive he seeks to become, has had the opportunity to do so. Small matter is it for the moment that in his advocacy of public ownership of water power he allies himself now nationally with the Pinchots and the Norrises. That he would commit the nation to a government ownership policy respecting water power development, which would lead inevitably to government competition in distribution and ultimately to the full extension of the public ownership program in all of its ramifications, those opposed to this scheme will be quick to note. And that he would go on with a public power project at Muscle Shoals and reproduce this fiasco at every available dam site in the country shows that he has much to learn about the power business. His views on these matters are disquieting. But it is of even greater concern at the moment that an aspirant for the highest office in the land would permit himself to prejudice the popular mind against a great basic industry with apparently little regard for the American principle that a man or a group of men are considered innocent until they have had a full and fair trial and have been adjudged guilty.

An Invaluable Handbook on Rapid Transit

EVERY large city in the country today faces, and for a number of years has been facing, the problem of providing rapid transit facilities for the millions of workers who must travel twice each day between their homes and places of employment. On the one hand growing street traffic congestion increases the need for speedy relief; on the other, the problem of financing stands as the greatest deterrent. The situation is little better in those cities that already have rapid transit lines, such as New York, Boston, Chicago and Philadelphia, than it is in those cities which have yet to initiate rapid transit programs, like Detroit, Pittsburgh and St. Louis. The need for additional facilities and extensions where rapid transit lines already exist presents a problem as acute as does that of starting rapid transit construction for the first time in those cities which have not yet undertaken this needed development.

In every instance the problem boils down to a single vital issue—that of financing the cost of construction. Though this problem is far from being generally understood either by the public or by transportation men themselves, there is general agreement on one point—that it is neither sound nor practicable to use private capital to be supported from the fares of the users of the service. Furthermore, it is quite generally agreed among all those who have given the subject earnest thought and study, that the cost of equipment, operation and maintenance should be carried by the fares charged, and that efficient operation is best insured by enlisting the initiative of private management free from the heavy hand of political patronage.

But there is no general agreement regarding an economically sound plan for financing the cost of rapid transit structures. Two plans have been tried; either the issue of city bonds, interest of which is paid from general taxation, or private financing, dependent on the ability of the system to pay its way out of car fares. Neither has worked. In each instance where an initial system has been financed by one or the other method or by a combination of the two, the plan has been unsatisfactory both to the community and to invested private capital, the transit facilities lag far behind requirements, and there is great difficulty in raising the money needed for new construction.

Obviously there is a crying need for a sound financing policy which may be adopted in the several cities in which

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the situation is acute. The time is particularly propitious for a general attack on this baffling problem, because a number of cities are about to commit themselves for the future by entering for the first time upon rapid transit construction. It is particularly important that they avoid the costly mistakes of those communities that were forced to go ahead before they really understood the economics of rapid transit.

All of this points to the value of the work that was undertaken some years ago by the rapid transit committee of the American Electric Railway Association under the chairmanship of G. A. Richardson of Chicago. In three successive reports this committee put together the best thought on the question of rapid transit economics that was available from the experience of those engineers who have lived with this subject for many years. To this it added the views of public bodies and officials who have given the rapid transit problem long and deep study. And then, in addition, the committee compiled figures and data to show the relative cost and capacity of rapid transit lines, and other plans for providing transportation improvement, such as street widening projects.

This year, upon recommendation of the American Electric Railway Association executive committee, the reports have been re-edited and rearranged to form a single volume for handy reference. As a result there will be available in one place a comprehensive summary of the best thought and data now available on this extremely important subject. In this work the committee, which includes in its roster a most impressive array of rapid transit experts, has rendered a service of immense importance not alone to the local transportation industry but to American municipalities as well. The report is worthy of very careful reading and study by every local transportation executive. By putting it into the hands of the proper public officials they will perform an invaluable service both to their companies and to the communities which they serve.

Find Out What the Other Fellow Is Doing

IN THIS fallible world, men learn only by the experience of themselves or others. It is obvious that the more extended this experience the greater our knowledge of any subject. This is the reason that many railway men here feel that there is much to be learned from practice outside the United States and Canada. In response to this sentiment, considerable space has always been given in the columns of this paper to accounts of foreign electric railway practice and research.

After all, the conditions under which European electric railways operate are very much like those with which American railways have to contend. They have the same problems of track, overhead construction, equipment, maintenance, discipline, car routing and the merchandising of transportation.

One chief difference is that, as each country is largely a separate market unit, equipment in Europe has not become standardized so extensively as here. America offers such a large market by itself that mass production methods can be used here in many lines in which they would not be warranted in any single country abroad, but this condition has its drawbacks. Changes from standards are more difficult here than there.

The result is that in Europe experiments can be tried more easily. This probably accounts for the first use abroad of many practices which were afterwards adopted here, such as forced ventilation for railway motors. It also explains why we look to Europe for current experiments in other equipment whose value is not yet determined, such as bevel-gear drive, radial trucks, noise reduction and the use of light-weight metal in overhead appliances. In lines other than mechanical, European electric railway companies have also done very fine work, as in the examination and training of transportation employees and in the merchandising of transportation.

American managers and engineers can well give consideration to improve methods or practices, wherever employed. European managers and engineers frequently make visits here to attend our conventions and study our practices. Corresponding trips from here to inspect European railway methods would be very much worth while.

Remove the Barriers to Standardization

STANDARDIZATION of special trackwork in the electric railway industry is hindered by numerous differences of design, many of which are found to be only minor, according to William J. Nixon, department of city transit, Philadelphia, Pa., in an article appearing elsewhere in this issue. The variety of frogs, switches and other assemblies requested by electric railways is a serious handicap both to the trackmen themselves and to the manufacturers. It is almost impossible for a manufacturer to keep on hand a supply of material adequate to permit prompt delivery. Moreover, the large assortment of rails with which he must be provided increases overhead cost, adds to the price and may lead to expensive errors due to the difficulty of identifying rails of almost the same dimensions. Different types of rail sections vary only $\frac{1}{16}$ in. in some dimensions, which is no greater than the variation found on different rollings of the same rail. The contour of the rail, the cant at which the rail is set, and many other details enter into the construction of special trackwork.

Switches vary from the spiked-over rails of mine track to the highly complicated and adjustable switches used on some of the rapid transit railways. Although interesting, their many designs are one of the "bugaboos" of the trackwork manufacturer. For some time past the American Electric Railway Engineering Association has had under consideration a design for a standard tongue switch. On the one hand, its proponents assert that there would be a real advantage in the opportunity to purchase from any manufacturer, and eventually simplified maintenance would also result from its use. On the other hand, it is claimed that this new switch would not eliminate any of the designs now in use but would simply add a new design to the ones already in operation and perhaps discourage further improvement.

In all standardization there is a certain amount of difficulty. The disadvantages must be weighed against the advantages before a standard is adopted. It cannot be denied that the electric railway industry is burdened with an excessive number of trackwork designs. Standardization is hindered, however, by the firm adherence of many way engineers to their own pet designs. The attitude of the electric railways toward standardization does not differ greatly from that of other industries. Every industry tends to imbed itself in a network of obsolete and semi-obsolete equipment and methods of procedure. When a new device is developed to replace

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older apparatus, the one of ancient design is carefully preserved for use in a few remote places where it is thought to work better than the new one. This procedure continues until increased overhead and diminished profits force into use drastic revisions and standardization on a new basis. To achieve standardization some minor advantages of special design must be thrown away for the sake of greater simplicity and economy in the long run.

A Code That Makes for Progress

MUCH has been accomplished by the Central Electric Railway Association in the development of the freight business in its territory. Not the least important move it has made is the standardization of much of the freight equipment so that it is interchangeable over all of the lines. It has gone even further; it has standard rules and a set of uniform charges for such repairs to equipment as must be made on foreign lines. These standards, worked out in considerable detail by the Central Electric Railway Master Mechanics' Association, were adopted and put in effect something more than a year ago. They proved of such value that the committee in charge was prompted to follow through with a revision, taking into account the experience gained from the actual use of the rules.

The code of rules, standard forms, and uniform charges for repairs to equipment have now been grouped together. While the JOURNAL published the original code and the uniform charges at the times when they were first adopted, there have been enough revisions and amplifications to justify a republication of the material as a whole. The first installment, published this week, consists mainly of the code of rules. It will be followed by the standard forms and the list of uniform charges. The whole has been placed in the note-book section, uniform with other material published for the benefit of the maintenance forces.

While in no other part of the country does the opportunity for interchange of electric railway freight equipment exist as in the C.E.R.A. territory, the code and the inspection cards represent the most progressive practice and should be of value to railways elsewhere. To those in the central territory the information is, of course, invaluable.

San Francisco Has a Chance to Show Its Good Faith

SAN FRANCISCO has every reason to be proud of the conduct of the Market Street Railway. Beset by the imminent menace of the municipalization of its lines and with its franchises soon to expire, the company has carried on courageously in the face of great odds at a 5-cent fare. When Samuel Kahn, president of the railway, referred recently to the improvements in service and in property there, the comfort, care and courtesy of operation, and the new transportation features originated under the present direction as having commanded the attention of the patrons and the transportation world as well, he was telling the plain truth.

Mr. Kahn wants only one thing. He wants his company freed from the impending hocus pocus of politics likely to attend the expiration of the franchises before the city has determined on the course it will pursue as to taking over the property. To that end he has indicated the willingness of his company to accept revocable operating permits to continue until the city is ready to act. It is a reasonable suggestion, and in the last analysis is one made in the best interests of the railway and the city, if the public is to continue during the period of purchase negotiations to enjoy service of a type which the railway has furnished in the past. The revocable permit would be accepted by the company with the understanding that no claim for value would be made on that account in the event the city subsequently exercised its right to revoke the permit for the purpose of acquiring the property. That is a just proposal.

In the face of unpropitious prospects such as are likely to attend the expiration of franchises, the railway might have assumed an attitude of indifference. That has happened in other similar cases. But the management at San Francisco has gone along progressively, guided by the ideal that the term public utility meant all that the words connote. That has been a fortunate thing for the residents of San Francisco. It remains to be seen whether the elected representatives of the people of San Francisco will treat with the company in this matter on a basis comparable with the attitude of the railway in dealing with the car-riding public.

By Rail, by Water, by Highway and by Air

CHANGING aspects of transportation are reflected in the avowed intention of the Transportation Survey Commission of St. Louis to conduct the broadest kind of an inquiry into the needs of that community. It will consider the requirements of a city twice as large as the present St. Louis, and will also inquire into the probable growth of the adjacent territory on the East side of the Mississippi and the counter effect of the growth of that territory on St. Louis.

The goal of St. Louis has long been a population of 1,000,000. It is a legitimate aspiration, but the realization of that aim carries with it concurrent obligations. Transportation by electric railway, by water, by motor vehicle, by steam railroad and by air will all be considered. The supplying of rapid transit is, of course, one of the most important phases of the study. Fortunately the electric railway problem at St. Louis has been studied previously. Whether rapid transit for St. Louis will take the form of elevated railways or subways or both is still to be decided. The new commission will take up this matter where others have left off, but will not supplement the previous findings unless that appears to be necessary.

The commission is unalterably opposed to any duplication of facilities. It is on record to that effect. The effort will be to provide for the co-ordination of the agencies which already exist. Best of all, the commission is cognizant of the financial problems involved. It would appear that any plan which is ultimately evolved will take fully into consideration the ability of the community to pay the way. Some of the probable changes will also include the determination of the question of whether private or public ownership is best. This presumably applies to any rapid transit lines that may be included in the final recommendations. There is evidence that the bearing of such construction upon fares, if the lines are run privately, is fully recognized.

This work appears to be starting auspiciously. The commission apparently is animated by "The Spirit of St. Louis." It is to be hoped that its accomplishment will not fall short of that spirit.

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Divergence of Special Trackwork Design Hinders Standardization

By William J. Nixon
Department of City Transit, Philadelphia, Pa.

Though track layouts are becoming more and more specialized, manufacturers are handicapped by the many forms of frogs, switches and other assemblies requested by electric railways

STANDARDIZATION is receiving a great deal of thought today. Many differences in design are found to be only minor, and in special trackwork this is especially true. However, the differences which do exist are a serious stumbling block for both the track men of the electric railways and the manufacturers. At one time special trackwork was a "home-made" proposition. Now there are several frog and switch plants which specialize almost exclusively on the one product. With the many types of rails in use at present for the various types of special trackwork requested, it is almost impossible for any manufacturer to have an adequate supply of material on hand.

Much more progress has been made on steam railroads than on electric railways in the standardization of special track layouts. This should be expected, since there are fewer special conditions to be met on steam roads and, generally speaking, the curves are of much larger radii and are designed for higher speeds. Also, most track for steam railroads is laid in the open, whereas for electric railways the most is laid in pavement.

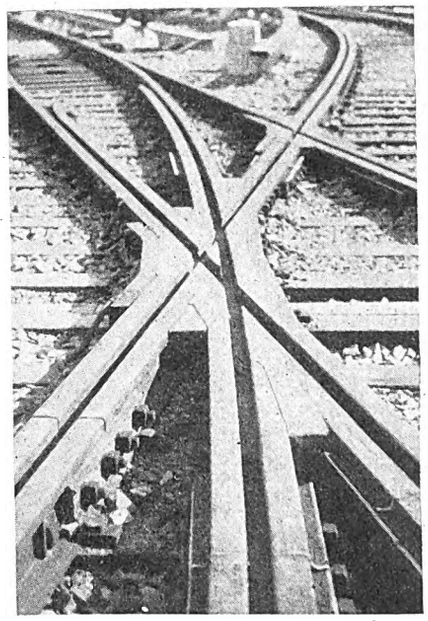

Fig. 1 — Unusually well-designed modern compound frog intersection based on A.R.E.A. design for rail-bound manganese steel

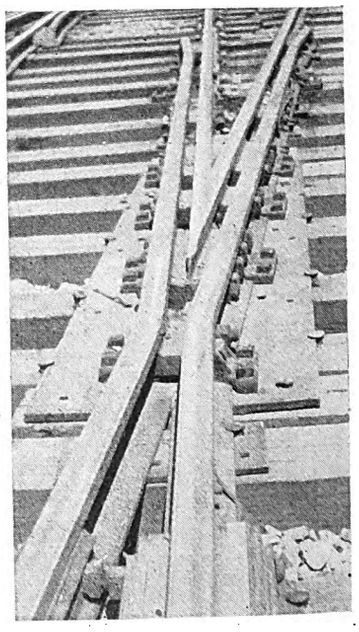

Fig. 2—Turnout frog built without manganese steel. Though on a siding its point showed considerable battering in a few weeks

A steam road can get along nicely with perhaps three lengths of switches and three angles of frogs as standard, because the long radii permit the use of straight pieces. Street railway practice is practically the opposite. Wheelbases are short, high speed in street traffic is impracticable and a derailment at the slower speeds is not a serious matter. The streets often are narrow and street railway curves are usually very short. Moreover, there are often several curves at one street intersection, so that the special trackwork becomes very complicated. Obviously, standardization on electric railways is almost impossible and usually is not attempted beyond standardizing switches, mates and some crossovers.

Track design for the high speeds of steam trains and the narrow streets to which most electric railways are confined, has been developed for the long and heavy trains of the subway and elevated lines. As a result, there are three distinct schools of practice: the open T-rail work as used by the larger steam or intercity roads, track as used in street paving by electric railways and a combination of the two as developed by rapid transit lines.

Cost of Trackwork Increased by the Many Types of Rail in Use

Examination of the three rail sections, the Reading Company 100-lb., the Pennsylvania System 100-lb. and the A.R.A. section "B" 100-lb., reveals that they are quite similar; in fact, in some dimensions they only vary by $\frac{1}{16}$ in. This instance could be multiplied. Inasmuch as different rollings of the same rail often vary by as much as $\frac{1}{16}$ in. it becomes difficult for the manufacturer of special trackwork to identify these rails. Moreover, the great variety of rails he must keep on hand increases his overhead, adds to the cost of work and may lead to expensive errors.

A point for the customer to remember is that certain rails are not used extensively and the manufacturer may not have them in stock. In this case it would be necessary to send rails to the manufacturer for fabrication

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and the delivery would be delayed considerably. The contour of the rail must be kept in mind. The head of the A.S.C.E. rail section has parallel sides. Most other rails of 100-lb. section and under have the sides of the rail head diverging or sloping slightly. A slight slope may be desirable, but an extreme slope is dangerous. On sharp radius curves or on switch points an unreasonable slope to the side of the rail head may be sufficient for the wheel flange to climb the rail or to pick the switch point.

A comparatively new development in trackwork is the practice of canting the rail to follow more closely the contour of the wheel tread and to take the side thrust of rolling stock so as to distribute pressure more evenly on the ties. Canting of rails has been definitely recommended by the A.R.E.A. and is rapidly coming into general use. Where rails are canted special provision must be made for the special trackwork.

The development of special trackwork has been interesting. In one of the old log railroads two movable logs were used for switches and a third movable log, pivoted in the center, was used as the frog. In the old-fashioned stub switch two movable rails were butted against two fixed rails for the straight run and swung to two other fixed rails for the curved run. With an old type of frog a member of the yard crew would run ahead of the cars to take a movable piece out of one slot and drop it in the other slot to allow the cars to pass through. A stone body frog with metal insert was the precursor of the manganese steel insert frog of today.

Manganese Steel Strengthens Trackwork

When a piece becomes too complicated, it sometimes can be built entirely of manganese steel for very little additional or even less cost. That is particularly true of tongue switches for street railways. Solid manganese steel construction also has the advantage of being free of stretching bolts, loose rails, etc. A modern compound frog intersection of rail-bound manganese steel and based on A.R.E.A. design is shown in Fig. 1. In Fig. 2 is shown a frog without manganese steel. A rule placed across the point of this frog showed a considerable battering down of the point in a few weeks, even though it was located on a siding.

Other types of frogs are the adjustable spring rail and the self-guarded frogs. The adjustable frog uses shims

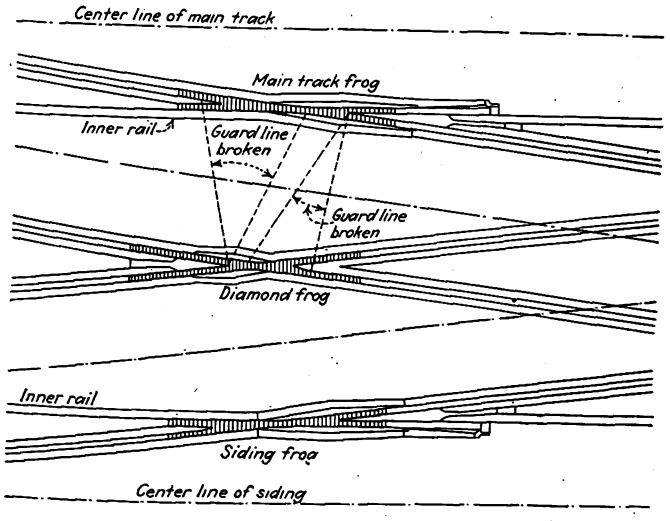

Fig. 3—Double crossover in which the diamond frog is unguarded at its critical point for a distance of several feet and the main track frog just barely guarded by the diamond

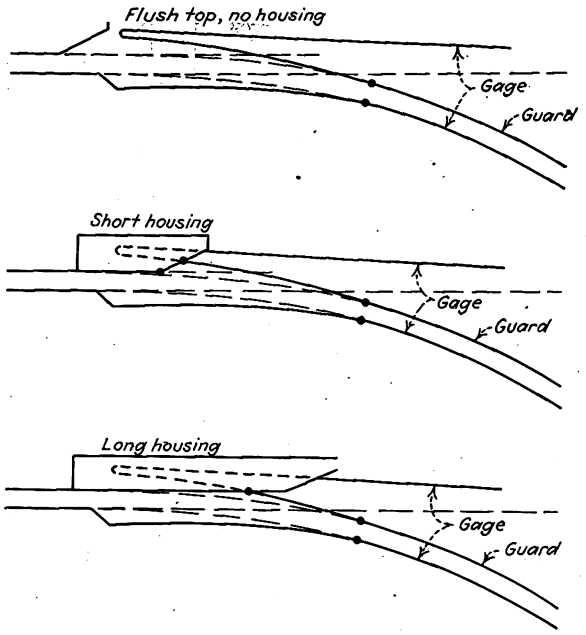

Fig. 4—Three types of guarded switches used for short radii

in its flangeway and laps at its joints to provide for wear. It has not come into general use.

The spring type of frog usually has one flangeway held rigid and the other flangeway, when not in use, held closed by a spring bearing against a movable rail, in this way favoring the main line both for flangeway and bearing under the wheel tread. A double form is often used in open T-rail track by electric railways using very narrow wheel treads. Spring frogs were more popular at one time than they are today, although one large steam road reports abandoning them and now returning to their use in a modified form.

The self-guarded frog is the newest development. In this type, instead of using the separate guard rails opposite the frog a guard is cast directly on the tread surface of the casting and operates against the edge of the wheel tread instead of the wheel flange. It has been adopted as standard by some roads while others use it only in freight yards.

Much thought has been given the subject of guarding frogs properly. For this purpose a number of guard rails have been developed. Some of these are very simple while others are quite complicated. The long wing rails of the frog shown in Fig. 2 are particularly interesting. They are formed by adding guard rails to the end of the frog. The guard rails absorb some of the wheel blow before the wheel enters the frog from the wing end and have a tendency to keep the wheel truck straight after leaving the frog. Railroad men claim that considerable friction exists in this type of special trackwork, particularly in the case of heavy freight trains, so the A.R.E.A. designs favor very short guard lines. A section of a double crossover diamond in which the diamond frog is unguarded at its critical point for a distance of several feet is shown in Fig. 3. The main track frog is just barely guarded by the diamond.

Judging from the variety of designs, switches are the most interesting part of and the "bugaboo" of trackwork. They vary from the spiked-over rails of mine track to the highly complicated and adjustable switches of some of our rapid transit railways. The most popular switch and the basis of all designs of today is the ordinary split switch. Even the tongue switch used in paved

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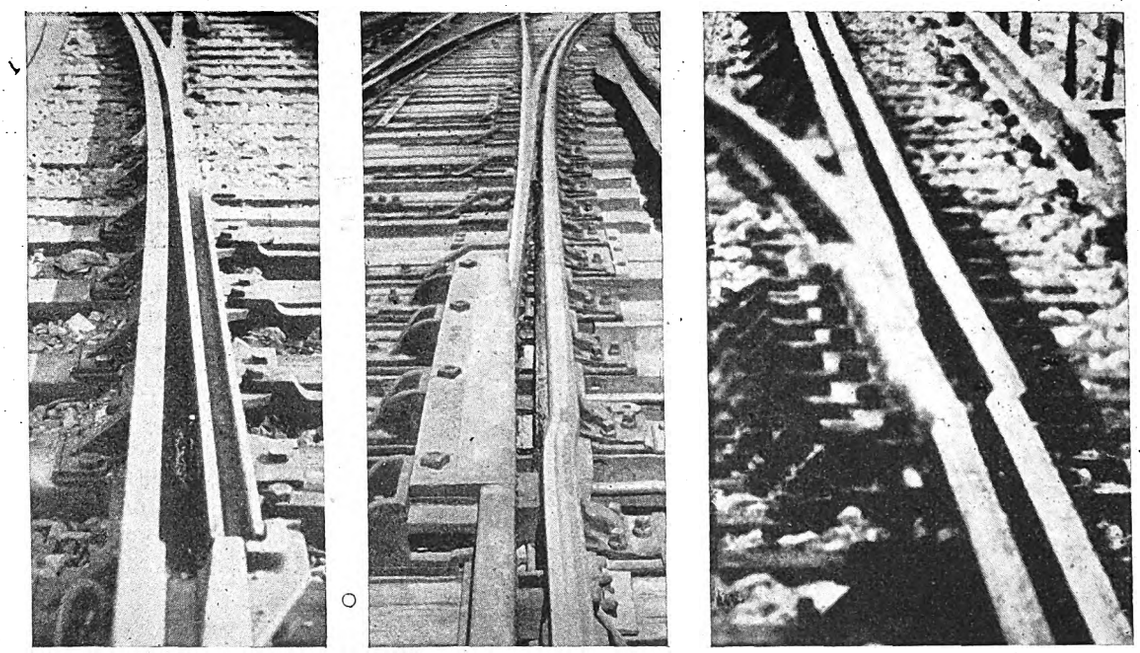

Fig. 5—In the left view is shown a flush top guarded switch as used in Philadelphia. The center view shows a short housing as installed in New York, while the right view is of a long housing used in Boston

streets is but a modification of the split switch design, using instead of a rail a tongue 2 in. or 2¼ in. deep. Its mate usually has its flangeways open in both directions and the flange of the wheel often bears on the bottom of the groove.

Some split switches are made so that the points may be staggered by setting the main track switch rail one tie space toward the frog. This setting has the effect of bringing the guard rail to a point where it will lap the turnout switch rail, thus having a tendency to throw the car weight farther back on the switch rail to a point where it is thicker and better able to stand the blow. This position of the guard rail also has a tendency to eliminate the necessity for housing. Protecting the points results in a considerable reduction in wear.

For extremely short radii, guarded switches have been developed. Three types of guarded switches are illustrated in Fig. 4—one with flush top, one with a short housing over the point, the housing acting similar to the guard rail of the split switch with staggered points, and one with full housing, this last type giving the smoothest guarding. The three types are further illustrated by Fig. 5, which shows, respectively, the flush top switch as used in Philadelphia, the short housing as used in New York and the long housing as used in Boston.

Regenerative Braking Tested on P.-L.-M. Locomotives

REGENERATIVE braking tests recently have been carried out on one of the large 1-B-B-2 electric locomotives of the Paris, Lyons & Mediterranean Railway. The locomotives were built by the Oerlikon company. The trial locomotive was subjected to tests on the electrified system between Culoz and Modane with a view to ascertaining whether the operation of the locomotive was affected in any way by sudden fluctuations of pressure, such as are encountered during service.

The trials were carried out with a trailing load of 500 tons (25 cars), the pressure at contact line being raised or lowered by about 500 volts every 20 to 30 seconds. The train was, in each case, accelerated down the incline, after which the speed was gradually reduced by electric braking. Throughout the tests, braking took place without any noticeable jerks and without disturbance in the motor. Some of the readings are as follows:

Speed M.P.H.	Controller Notch	Motor Grouping	Braking Current, Amp.	Exciter Current, Amp.	Pressure at Contact Line Volts
54.6	8	Parallel	500	1,000	1,700
53.9	8	Parallel	1,000	700	1,250
28.5	11	Series parallel	500	1,000	1,700
26.6	11	Series parallel	600	750	1,200
20.4	9	Series	400	800	1,500
16.1	9	Series	400	600	1,000

It is said that the type of individual drive adopted has given excellent results during the two years the locomotive has been in service. With locomotives designed, as here, with outer frame and fixed gears, this drive takes the form of a quill working in conjunction with articulated couplings acting through springs and arranged on either side, between wheel and frame; the couplings are entirely unprotected so that they are easy of access. Unlike the individual drive with totally enclosed coupling and automatic lubrication by pump, the present drive is arranged for periodic lubrication of coupling pins by hand, with thick oil, by means of a Tecalemit device. The lubrication has to be carried out after a certain mileage fixed by experience; when carrying out this operation, there is no need to move the locomotive as all the points of lubrication are accessible in every position of the locomotive. The fact that the coupling has, up to now, required no attention testifies to its reliability. An inspection of the pins and bearings has revealed no visible wear.

Apart from this, and the Burgdorf-Thun drive, the Oerlikon company has evolved a further type of individual drive which is being installed on a trial locomotive with quill and outer frame. This locomotive is designed for a maximum speed of 86 m.p.h. The drive embodies a totally enclosed coupling arranged on one side between the driving wheel and the motor.

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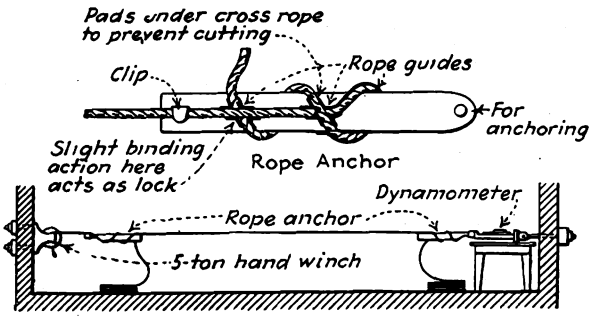
Testing of Work Ropes Essential to Safety

By M. R. Sumner
General Superintendent of Construction
and
G. E. Balch
Superintendent of Materials
Byllseby Engineering & Management Corporation, Pittsburgh, Pa.

ROPE plays an important part in any number of jobs on a railway property. Particularly is this the case where electric power and transportation activities are carried on under the same management, and involve the employment of maintenance and construction crews from the shops and overhead lines department. On account of the large volume of construction work which was handled for the Philadelphia Company and its affiliated operating companies by the Pittsburgh branch of the Byllesby Engineering & Management Corporation in 1927, we found ourselves at the beginning of this year with a large supply of rope on hand, varying as to size and condition. Nearly all of this rope had been used and much of it was soiled with grease and mud. As there is very little salvage value in second-hand rope, and as we are constantly using it in our work, the problem was how to make the best use of this rope and yet do it without jeopardizing the lives of our workmen. Reference to various handbooks for information relative to the loading that might safely be applied to various sizes and kinds of rope disclosed no uniform or reliable published data on this subject and it became necessary to develop original information to meet our requirements.

Since nearly all of this rope is used in blocks (these tests do not concern steel rope, which is more commonly called cable) it was necessary to know the forces set up when the ropes were so used. Two tests were made to determine these values. In the first, a set of steel blocks having a sheave diameter of 1½ in. was used, while the second used a set of wooden blocks, having a 3-in. sheave diameter. In the testing layout, the load end and the dead end of the rope were anchored to dynamometers, and a fall line pull of 500 lb. was applied. By varying the number of sheaves the relation between the load and the dead end pulls to the fall line pull could be established. This information gives a foundation for the actual testing of the ropes, and is printed on the reverse side of the rope testing tag, a sample of which is reproduced herewith. One of these tags, with the testing data filled in with ink, it attached to each length of rope after it is tested. This tag informs the foreman who receives the rope on a job that it has been tested, and the maximum safe loading he can put on it.



Rope Testing Set Up - Safety Guard Screens at Both Ends not Shown

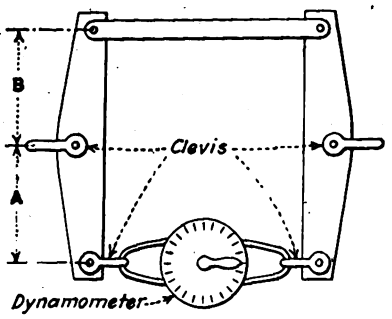
Rope Anchor and Rope Testing Set Up

The illustration shows a rope anchor, developed to hold an "endless" rope without any cutting action. The anchoring action is practically all due to snubbing. The "lock" binds the turns effectively. All bends are so designed that the radius is the same as that of a sheave for that size rope.

Anchor Diameter for Different Sizes of Rope

⅜ in. and ½ in. rope—2¼ in. diameter pipe
⅝ in. and ¾ in. rope—3½ in. diameter pipe
⅞ in. and 1 in. rope—5½ in. diameter pipe
1⅛ in. to 1⅜ in. rope—8 in. diameter pipe

Two operators are needed in making the tests. One man operates the winch while the other reads the dynamometer. The test value marked on the test report which is attached to the rope is placed 33⅓ per cent lower than the actual results obtained to provide a factor of safety.



Apparatus Developed for Special Rope Tests

For tests involving forces not taken care of by the dynamometers, the special piece of apparatus illustrated has been developed.

Ratio B to A		Capacity
...	Small dynamometer	0–3000 lb.
1–1	Small dynamometer	0–6000 lb.
1–2	Small dynamometer	0–9000 lb.
...	Large dynamometer	0–10,000 lb.
1–1	Large dynamometer	0–20,000 lb.
1–2	Large dynamometer	0–30,000 lb.

The rope anchor illustrated here is an original development which has been devised so that the position of the rope at the anchor end and also at the dynamometer end is the same as if the rope were operating in a rope block. These rope anchors have been made in several different sizes, as may be noted in the accompanying table. They were made to order for us by a steel fabricating shop in Pittsburgh.

Test on Rope Blocks

A large percentage of the rope used in the construction department is made up into sets of rope blocks. It is, therefore, important to know the forces at work when using these blocks, in order to define safe loads that may

TABLE I—STANDARD MANILA ROPE STRAIN TEST DATA

Size, In.	Tested Strain, To Be Marked, Lb.		Size, In.	Tested Strain, To Be Marked, Lb.	
¼	270	135	1⅛	5,120	2,560
⅜	540	270	1¼	6,240	3,120
½	1,000	500	1⅜	7,620	3,810
⅝	1,560	780	1½	9,000	4,500
¾	2,240	1,120	1¾	12,240	6,120
⅞	3,060	1,530	2	16,000	8,000
1	4,000	2,000			

TABLE II—ROPE TESTING USING SMALL STEEL BLOCKS

Number of Sheaves	Pull on Fall Lines, Lb.	Dead-End Pull, Lb.	Load-End Pull, Lb.	Per Cent of Pull on Fall Line from Curve Dead-End	Load-End
1	500	900	400	180	80
2	500	1,250	750	250	150
3	500	1,600	1,100	315	125
4	500	1,800	1,300	356	256
5	500	1,950	1,450	385	285
6	500	2,000	1,500	400	300

TABLE III—ROPE TESTING USING LARGE WOOD BLOCKS

1	500	950	450	190	90
2	500	1,400	900	280	180
3	500	1,800	1,300	360	26
4	500	2,150	1,650	436	33
5	500	2,550	2,050	510	410
6	500	2,800	2,300	560	460

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PITTSBURGH BRANCH

ROPE TESTING REPORT

SIZE ___ INCHES LENGTH ___ FEET.

DATE ___

TESTED FOR MAXIMUM SINGLE LINE PULL OF ___ LBS. ONLY.

TESTED BY ___ APPROVED BY ___

FRONT

SAFE LIFTING CAPACITY IN POUNDS OF VARIOUS SIZES OF ROPE AND BLOCKS

TOTAL NUMBER OF SHEAVES USED	SIZE OF ROPE IN INCHES								
	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8
ONE	215	400	625	895	1220	1600	2050	2500	3050
TWO	405	750	1170	1680	2300	3000	3840	4680	5700
THREE	580	1075	1675	2400	3250	4300	5500	6700	8200
FOUR	690	1280	2000	2870	3920	5100	6550	8000	9750
FIVE	770	1425	2200	3200	4350	5700	7300	8880	10,850
SIX	810	1500	2340	3360	4600	6000	7680	9350	11,400

REVERSE

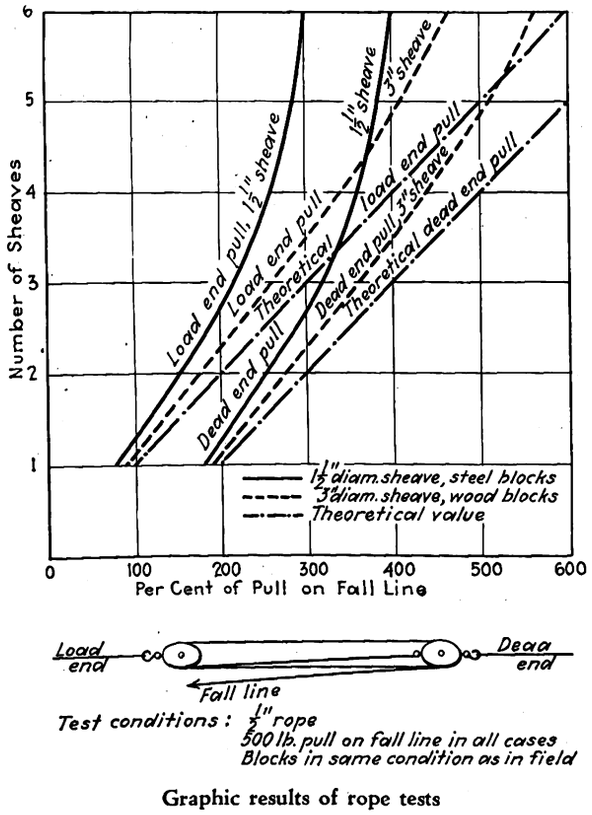
Rope Testing Report Card

The sketch shows the "Rope Testing Report" card which is attached to each rope after it is tested. Both testers sign the card. A table of safe lifting capacities for blocks is on the reverse side of the card. These values were obtained by multiplying the per cent of pull on fall line load end, Table II, by the allowable strain—Table I.

be handled. Two tests were conducted to determine these values.

In the first test, a regular stock set of ½-in. steel rope blocks were used with a sheave diameter of 1½-in. In the second test, a set of wooden blocks were used with a sheave diameter of 3 in. The test set-up was so arranged that dynamometers read the pull on the fall line, the load end, and the dead end. The load end and the dead end were solidly anchored while the fall line was attached to the winch. A fall line pull of 500 lb. was applied in all cases and the other two dynamometers read.

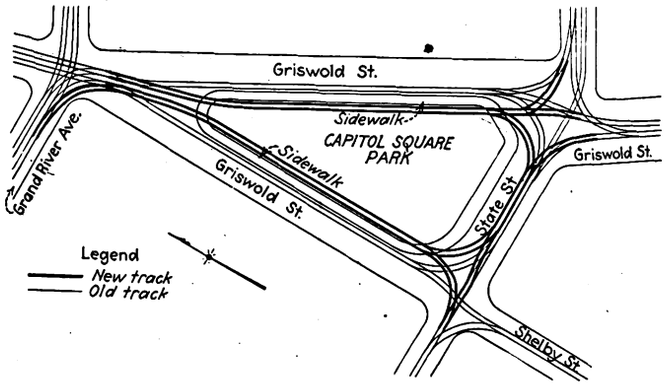
Only one size of rope was tested, namely; ½ in. It is assumed that the same percentage of friction loss would occur in other sizes. We have found that the cost of making these tests, based on the methods herein described, averages about 2.5 per cent of the value of the rope tested.



Graphic results of rope tests

Congestion Reduced by New Track Layout

RECENT track changes around Capitol Square Park, the downtown termini of the Grand River, Fourteenth and Myrtle Avenue car lines of the Department of Street Railways, City of Detroit, eliminate much traffic congestion at this important section and permit passengers to board and alight from the cars in safety. The new tracks were laid on the park side of the sidewalks which are now used as boarding platforms. The removal of tracks and safety zones from Griswold Street



New track layout around Capitol Square Park, Detroit, showing the tracks located on the park side of the sidewalks

has taken the street cars entirely away from the vehicular congestion along both sides of the park, and has eliminated practically all danger to passengers waiting to board the cars, all of which operate around the park in a counter-clockwise direction.

With the new layout it was possible to construct a clearance curve at Grand River Avenue and Griswold Street which has very noticeably decreased the congestion of all kinds of traffic at this busy intersection. Some years ago the westbound track on State Street, south of the park, was removed to conform with certain route changes. This change left the eastbound track south of the street center. As a part of the recent program this track was centered, permitting a faster movement of all traffic along the street.

Fourteenth Avenue cars now discharge and receive passengers, and Grand River Avenue cars discharge passengers on the west side of the park at State Street. Passengers board the Grand River, Fourteenth and Myrtle Avenue cars near the north end of the park on the east side of Griswold Street, where a raised platform 200 ft. long will soon be constructed. This platform will be used as a prepayment station for the Grand River and Myrtle Avenue lines. Fourteenth Avenue cars will continue to receive passengers just north of the prepayment station.

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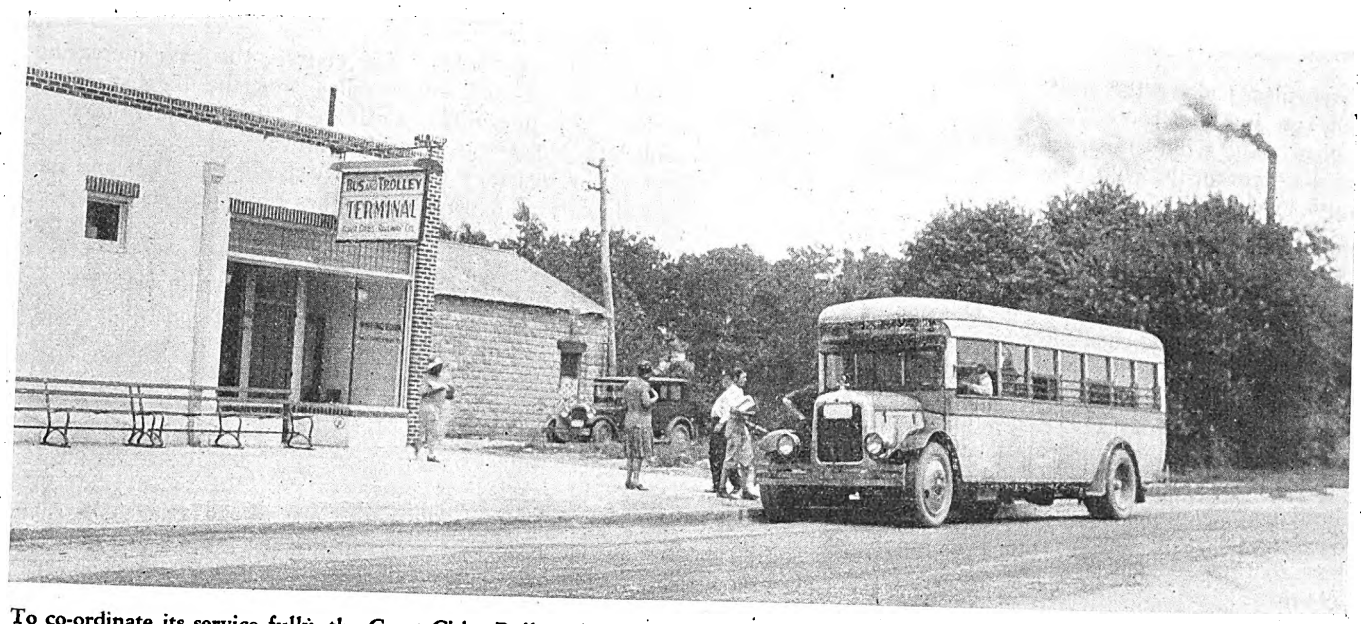

To co-ordinate its service fully, the Coast Cities Railway equipped a waiting room and terminal where the trolley and bus lines join

Coast Cities Railway Extends Co-ordinated Service

Passengers from Asbury Park to Manasquan, N. J., use trolley to Belmar, and there transfer to bus for remainder of trip. Rail service south of Belmar has been replaced because of indirect routing and high operating cost

FOR many years local transportation between the New Jersey coast towns of Manasquan, Sea Girt, Spring Lake, Como, Belmar, Avon, Bradley Beach, Ocean Grove and Asbury Park was furnished only by a steam railroad and a street railway line, partly double track and partly single track. In 1924 bus service was established to connect all these communities. Double-deck buses were selected for use over this route, as the territory is picturesque and operation is confined to summer months. Now service on the portion of the railway system between Manasquan and Belmar has been discontinued and single-deck buses are used to provide transportation in this area. Early this summer the New Jersey Board of Public Utility Commissioners approved the petition of the Coast Cities Railway to abandon the line and to substitute bus service.

The company based its plea to the board on operating figures which showed a considerable loss over the past two years. The southerly portion of its line was particularly expensive to maintain because of several bridges and because the track was old and constantly in need of repair. Along this part of the New Jersey coast are many small bays and fresh water lakes and the railway had to construct a considerable number of bridges to provide a reasonably direct route along the coast. Many of these are long and expensive to maintain. One of the bridges, that over Wreck Pond, between Spring Lake and Sea Girt, is 1,000 ft. in length. The original cost of these was extremely heavy because the company not only had to construct the bridges and do a vast amount of filling in, but also because it had to purchase private rights-of-way for them.

Indirect Route Was Used for Rail Line

The route is indirect, and is approximately 4¼ miles long, even though the two points it joins are only a little more than 3 miles apart. The route has many turns and at several points goes east and west, even though the main direction of travel is north and south. There are several places at which the route might have been shortened, but instead it detours two or three blocks out of the way and then comes back to the direct same north and south line. Because of the many small bodies of water which indent the coast, the railway was forced to go inland at several points to bridge the bays.

There were some other difficulties that affected the route also. At the time the line was constructed the population was very scattered and the various little centers were not very well built up. In some the population was concentrated near the coast, while in others it was farther inland. Because the territory was not thickly populated, the rail line was obliged to go through as many centers of population as it could, and for this reason did not follow a very straight route. Inability to secure permission to build a line on certain residential streets was another difficulty encountered. At two or

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three places along the route the railway was obliged to take an indirect route because the residents along the logical route would not permit the rail line. Because of the long route, the ride from Belmar to Manasquan was quite long.

Numerous "Bottlenecks" Harmful to Schedules

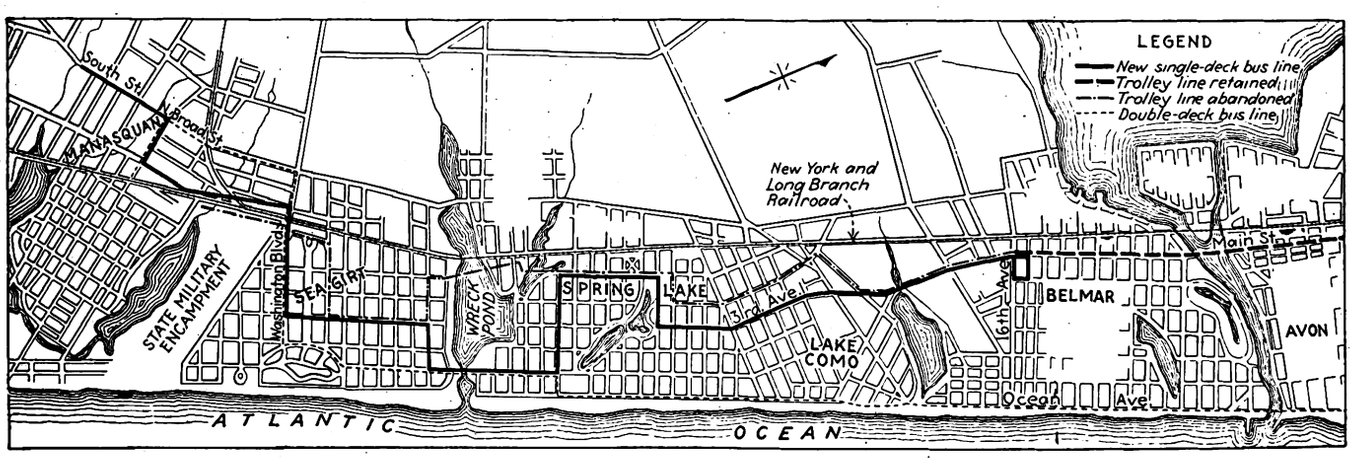
Adding to the complexities of operating this portion of the route are numerous "bottlenecks" which hindered the progress of the cars considerably during the summer months. The coast cities have an enormous influx of pleasure seekers during the summer months, especially over the week-ends, and thousands of automobiles are driven over the north-and-south arteries along the coast. The bays and lakes along the coast make numerous "bottlenecks," and because there are no alternate routes to take in certain places, the railway was forced to go through these narrow points also. Sometimes traffic is held up for long periods at these places, and on busy days when traffic is moving its fastest the progress is very slow. Naturally, this had a disastrous effect on the schedules of the trolley cars.

Another very vital factor which affected the railway is the wide variance of travel in the summer and winter months. The permanent population of the cities served by the Coast Cities Railway is approximately 50,000. In the summer, however, vacationists and transient pleasure seekers swell the population to more than 600,000. Most of those who go to the beach resorts come by railroad and in moving from city to city use the local transportation system. However, the season, when the business is heavy is very short, usually from the first of July until the middle of September, and as a result a serious economic and operating difficulty must be met. The portion of the rail line that was abandoned was affected greatly by this seasonal change in traffic. In the summer months the line was very profitable, but for nine months of the year it did not carry enough passengers to meet its operating expenses. The need for training many operators in the summer months when the traffic increased, and the necessity of releasing the extra employees in the fall, offered a slight problem, but one not peculiarly confined to this portion of the route.

Competition Steadily Increased

The presence of competition has exacted an enormous toll from the railway and the portion of the line abandoned had been pressed, perhaps, to a greater extent than the other routes. Of course, the ever-increasing number of private automobiles was the biggest single factor. But in addition to this was the attractive double-deck bus line operated by the railway, which, although it served the territory immediately along the coast and not inland, carried many passengers that otherwise would have used the trolley cars. People preferred to use the double-deck buses because they follow a scenic, and therefore much more attractive, route and make better time. Inasmuch as the railway depended on an enormous business in the warm months to make a profit for the entire year, the decrease of the summer travel on the railway line was very harmful.

As previously mentioned, the old track cost a vast amount of money each year to maintain. The entire length of track was much in need of repair and the company was faced with the problem of reconstructing the entire route if it was to continue giving service over it. The cost of rehabilitating the line would have cost many thousand dollars and was not warranted by the business done on it. The overhead, too, required excessive maintenance and would have needed replacements in certain sections.



Map of a section of the Coast Cities Railway lines showing the new single-deck bus line and the abandoned trolley line from Belmar to Manasquan, and the lower portion of the double-deck bus route

The company had learned from its other operations that the bus was sufficiently popular to be the answer to the problem, and accordingly entered a petition to substitute buses on the lower portion of its route. Inasmuch as the rail line was continued as far down as Belmar, the service was extended from Belmar as far as Manasquan, giving a co-ordinated service between Asbury Park and the lower cities, over rail and bus.

Before the institution of this bus line the company had been operating not only the double-deck bus line from Long Branch to Manasquan, but also a single-deck bus line from Asbury Park to Long Branch. The management had learned that the buses were better able to get through the "bottlenecks" and were better suited in other respects for this peculiar type of service. It found also that bus operators were easier to train than street car operators, because the majority of men today drive automobiles.

The new co-ordinated service was put into effect in the early part of June of this year, following the granting of permission from the Board of Public Utility Commissioners. Although the bus route is not much more direct than the old rail route, it reaches a greater portion of the population and still covers the distance in considerably less time. The buses are operated on a twenty-

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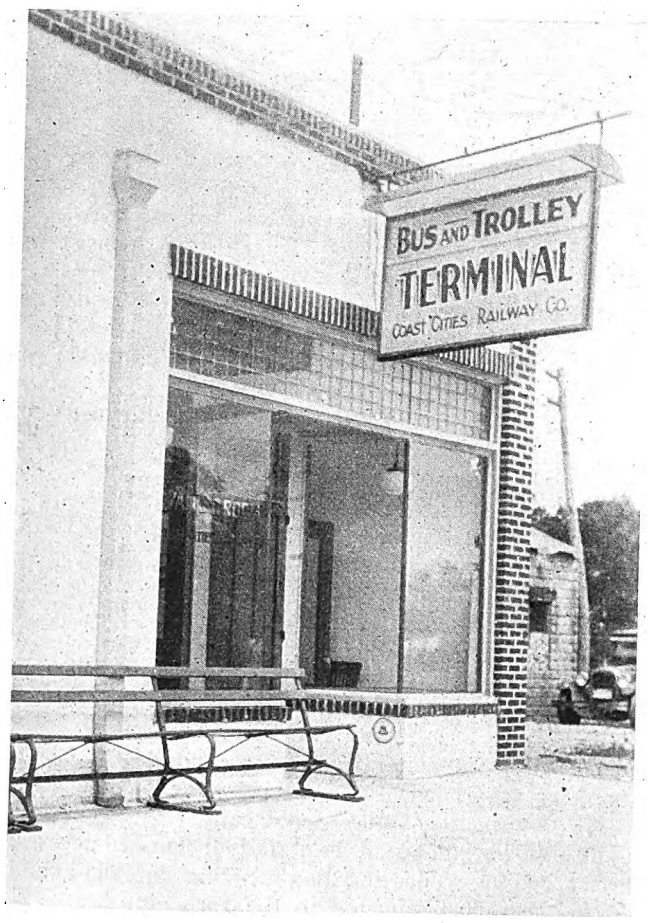
minute schedule, while the street cars to Belmar maintain a headway of ten minutes, with a headway of five minutes during rush hours.

The company is using for this service three buses that were formerly used on one of its northern routes. All are 29-passenger, single-deck, Yellow coaches. They are painted a uniform light gray, the standard color of all equipment. During rush hours this service is augmented with additional buses on a fifteen-minute headway.

To make the co-ordinated service complete, the company rented space in an attractive building near the end of the rail line and made it into a very pleasant



The bus and trolley terminal is very attractive and has several conveniences for the patrons

waiting room. The room has a number of chairs, a telephone booth and other conveniences for the patrons, and being but a few steps from the car line is easy to reach. Passengers leaving a street car can easily find the terminal, for a huge sign reading "Bus and Trolley Terminal—Coast Cities Railway Company," is suspended outside of the building. Two views of the terminal are shown in accompanying illustrations.

The company which operated the street railway from Manasquan on the south to North Long Branch on the north, prior to 1924, was known as the Atlantic Coast Electric Railway. The company was then taken over by a new management, reorganized and named the Coast Cities Railway Company. At that time no buses were being used and the new management, aware of the need for this type of service, organized a new bus company known as the Atlantic Coast Transportation Company. A comprehensive system of feeder bus lines centering in Asbury Park was laid out to serve territories not reached by the trolleys and to give a co-ordinated bus and trolley service. In addition, two double-deck bus lines were established, one running north from Asbury Park to North Long Branch, and the other running south from Asbury Park to Manasquan. The greater portion of the route was over the famous Ocean Avenue, which follows the shore line very closely, and was intended to secure the patronage of sightseers and vacationists at the summer resorts. The line proved profitable and over a large portion of the route did not harm the rail lines.

To provide this service the company purchased 23 Yellow coaches, of which ten were single-deck and thirteen were double-deck. Owing to increased demand for additional service it was necessary to purchase six more buses, making a total of 29. These are of the semi de luxe type and are in great demand by the riding public. The fares for the single-deck line were established at 10 cents, whereas the double-deck lines were operated on a zone fare basis, three zones for each line, at a fare of 10 cents per zone.

During the first few months of bus operation the city line routes were changed several times to determine the most satisfactory ones for permanent use, and not including the new line from Belmar to Manasquan, they now consist of three separate lines covering a wide territory west and southwest of Asbury Park. In addition to these lines the company also operates a local bus line between Asbury Park and Long Branch.

After the bus service had been established securely, the company ventured into the taxicab business, giving a complete co-ordinated service in Asbury Park of trolley, bus and taxi, and giving taxi service to Red Bank and Lakewood, two cities not served by any other local transportation means. Full details of the new co-ordinated system of street cars, buses and taxicabs were given in an article by H. T. Pritchard, vice-president Utilities Power & Light Corporation, New York City, in the Dec. 12, 1925, issue of ELECTRIC RAILWAY JOURNAL.

Although the Atlantic Coast Transportation Company and the Coast Cities Railway were both under the same financial control, it was felt desirable to make them one company and a petition to combine them under the name of Coast Cities Railway Company was approved on Oct. 8, 1927, by the Public Utility Commissioners.

Car and Bus Directory for Washington Patrons

STREET car and bus lines of the Capital Traction Company, Washington, D. C., are shown on a map and described in detail in a directory recently issued by the company. The folder was designed to give complete information about all car and bus lines for both residents and visitors in Washington.

The map shows all the car and bus base routes, the individual routes being indicated by various symbols. Many points of interest in the city, including the United States Capitol, the Library of Congress, the White House, the Washington Monument, Bureau of Standards, and several other government buildings, are indicated on the map. The indication of these points is especially valuable to visitors, since the map shows in addition to the regular bus routes and street car lines, the four parlor bus routes operated by the company. These pass most of the points of interest.

The description of the individual street car, bus and

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coach lines include the terminals of each, the streets traversed, the points of interest along the routes and the headway maintained during the non-rush periods. In addition, the folder gives the schedule of all night cars and buses; the first and last coaches, buses and cars on week-day schedules; and the first and last cars on Sunday schedules. The rush-hour schedules are not given in the folder, for the rush-hour cars and buses are all in addition to the regular base equipment and do not affect the base schedules as described.

A Simple Formula for Car Replacement Calculations

Many factors should be given proper weighting in determining the advisability of replacing old cars

By H. S. Williams
Assistant Superintendent of Equipment Department of Street Railways, City of Detroit, Mich.

In the Aug. 20, 1927, edition of the Journal on page 302 an article was published setting up a formula for determining, under any given set of conditions, whether retirement of old-type street cars and their replacement with new equipment is justified. Since that time considerable interest has been manifested in the method shown and this has prompted a closer study of the problem, which, in turn, has shown the desirability of elaborating somewhat on the original formula to the end that it be more easily applicable.

In order to make the plan clear and to avoid the necessity of referring to the previous presentation, some of the original matter is repeated here. As a basis, it is assumed that when the annual cost of maintenance, operation and carrying charge of a new car is equal to or less than the similar cost of an existing old-type car, the purchase of new equipment is justified and desirable. However, in order that a true comparison of costs may be set up, it is necessary to apply certain adjustments. If a car is replaced by another, it is the net cost of the new car which should be used in calculation. This explains why in the formula which follows the salvage value of the old car is deducted from the cost of the new car.

On the assumption that it is economically correct to amortize the cost of the new car, the average annual interest charge will be one-half of the interest rate and the carrying charge will be the net car cost multiplied by this average interest rate plus the amortization rate. To the carrying charge and amortization charge must be added the various elements which go to make up the maintenance and operating costs that are clearly set up in the formula.

The second formula representing the cost of the old car is quite similar to the first with the exception that interest and carrying charges are eliminated on the assumption that the car cost is paid up. If this is not the case, then this value must be included. Also, adjustments must be applied to compensate for different seating capacities and schedule speed, and a factor must be added representing the added sales value of the new car. These corrections bring the costs of the two cars to a strictly comparable basis. The seating capacity ratio is applied to all operating and maintenance costs, while the schedule speed ratio is applied to platform expense only as this item may be reduced with the use of higher speed cars. In making these adjustments it must be remembered that full advantage cannot be taken of improved seating capacity and speed when only a single or relatively few cars are being considered. There must be a sufficient number of cars under consideration to equip a line, otherwise the schedule cannot be adjusted to take advantage of the new equipment.

The formulas are as follows:

$$X = \left[(a-u)\left(\frac{s}{2}+t\right)\right] + (b+c+f+g+j)$$

$$Y = \frac{(d+e)m}{n} + \frac{hmo}{np} + \frac{im}{n} + \frac{km}{n} + r$$

Where:

X = annual cost of proposed new-type car,
Y = annual cost of old-style car,
a = estimated cost of new car,
b = car maintenance cost of new car,
c = track maintenance cost of new car,
d = car maintenance cost of old car,
e = track maintenance cost of old car,
f = operating cost (platform expense) new car,
g = operating cost (carhouse expense) new car,
h = operating cost (platform expense) old car,
i = operating cost (carhouse expense) old car,
j = energy cost new car,
k = energy cost old car,
m = seating capacity of new car,
n = seating capacity of old car,
o = schedule speed of new car,
p = schedule speed of old car,
r = added annual value of new car over old in receipts due to increased ride sales value of new equipment, decreased accident probability, etc.,
s = interest rate on new capital,
t = amortization rate per year on new car,
u = scrap value of old car.

The following data will be found all that are necessary to work out the values for the preceding symbols in addition to the items indicated in the foregoing;

Weights of cars.
Car-miles per year.
Ton-miles per year.
Energy cost for propulsion per ton-mile.
Track maintenance per ton-mile.
Platform expense per car-mile.
Maintenance of equipment per car-mile.
Carhouse employees and expense per car-mile.

In these data car-miles are figured equal for the two cars under comparison and adustments are applied in the formulas to bring both types of car to an equivalent basis.

In estimating the track maintenance cost it is recommended that this figure be based upon the theory that one-third of the cost is in the nature of a fixed charge; that is, that natural effects of atmosphere, rain, freezing, etc., cause one-third of the expense, and that the remaining two-thirds fluctuates with ton-miles of car operation.

It will doubtless be of interest to know that in applying the above method of figuring to an actual case, the estimated saving per car per year if replaced by modern equipment was found to be more than $1,900. Surely this is worth while.

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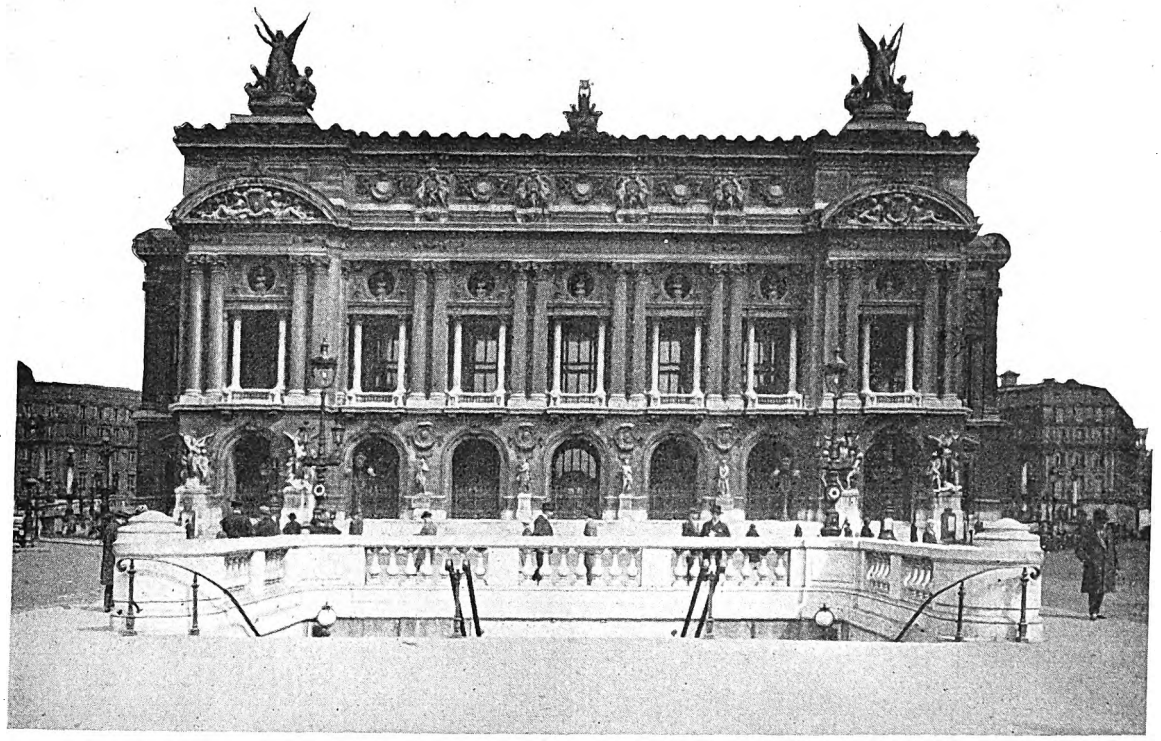

Entrance to station in front of the Paris Opera House. This is one of the busiest subway stations in the center of Paris

Paris Rapid Transit Lines to Be Extended

Permission has just been granted for extensions outside the old fortifications. Flat fare charged for any distance, but two classes of accommodations provided

By Walter Jackson

IN THE calendar year 1927, the Paris Metropolitan Subways (Chemin de Fer Metropolitain de Paris) carried 524,092,344 revenue passengers with 102,890,255 car-km. (63,791,958 car-miles). This represents a slight decrease in number of passengers carried and a slight increase in car-miles compared with 1926.

A flat fare of 1 franc (4 cents) is charged for first class accommodations and 0.60 franc (2.4 cents) for second-class accommodations. There is also a reduced fare for early riders, known as the workmen's round-trip ticket. The proportion of riders and revenue from the different classes during 1927 were as follows:

CLASSIFICATION OF RIDERS ON PARIS METROPOLITAN, 1927

		Revenue
First class, one-way at 1 franc, per cent	10.98	16.26
Second class, one-way, 0.60 franc, per cent	59.43	52.78
Workmen's round-trip, first ride before 9 a.m., 0.70 franc, per cent	29.57	30.64
Miscellaneous	.02	.32
	100.00	100.00

As the first-class riders make up only about 11 per cent of the total, only one car in the standard train make-up of five cars is set aside for their use. This is the central car, and it is colored red to distinguish it from the others, which are colored green. In the standard five-car train, two cars at one end and one car at the other are motor cars, the other two cars are trailers.

The permissible passenger capacity of each type is stenciled in the cars and is as follows: First-class, 33 seated and 46 standing passengers; second-class, 26 seated and 78 standing passengers. In a standard five-car train there are consequently 104 second-class seats and 33 first-class seats against room for 312 second-class standing passengers and 46 first-class standing passengers. Thus, while the first-class riders constitute only 11 per cent of the traffic they have access to 24 per cent of the seats.

Confusion in loading two classes of riders is avoided by the installation of a special "first-class" sign which is hung over the platform at about the position where the first-class car will stop.

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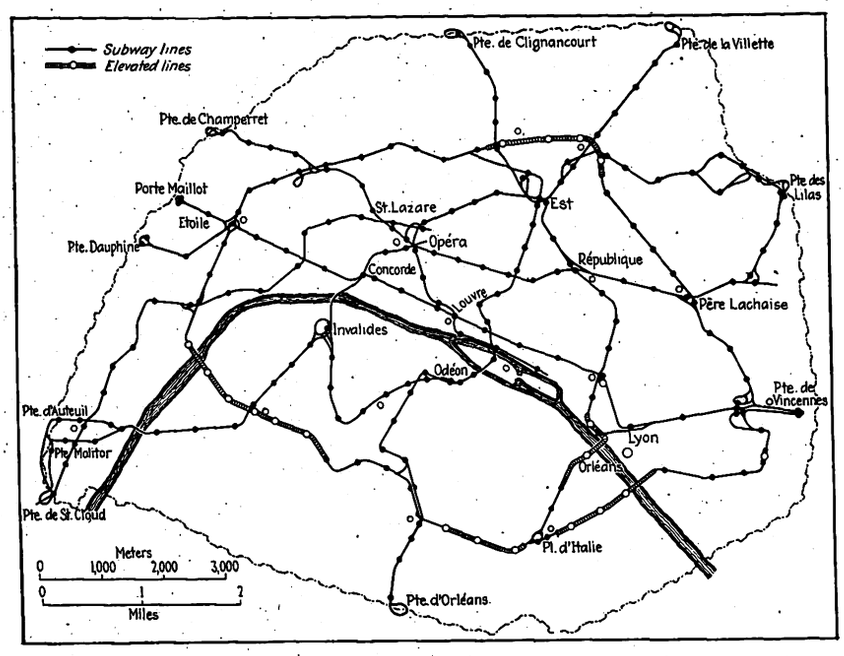


This map of Metropolitan Rapid Transit system in Paris shows clearly that the greater part of it is underground. It also illustrates the policy pursued in the past of stopping the lines at the city walls

As the first class riders get 20 per cent of the train capacity but yield only 16 per cent of the revenue, they are less profitable than the second-class riders, despite 66⅔ per cent more fare.

The cars are plentifully supplied with stanchions for the standees. A convenient feature of these stanchions is the attachment of parcel racks. This is made easier by the absence of advertising car cards. The city forbids all advertising inside and outside of subway cars. The nearest thing to an "outside" advertisement is a modest card announcing some public exposition.

Most trains are now served by three men, viz., motorman and guards in the first and last cars. The doors are closed by air, but may be unlatched by the passenger. Recent improvements make it impossible for the train to start before all doors are closed.

A couple of routes are still served by a fourth man whose duty it is to see that riders in the first-class car have first-class tickets. Plans are now under way to have one such inspector for every five trains.

Helping the Passenger About

Except for the absence of traffic posters, the Paris Metropolitan Underground shows the same assiduous attention to the passenger's needs as does the London Underground.

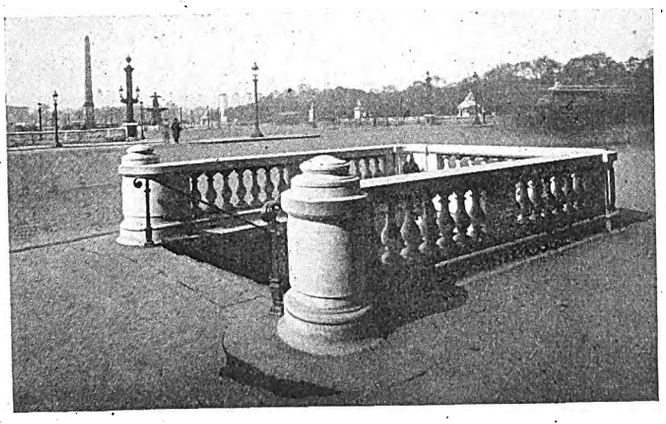
Outside the stations, in the lobbies and on the platform walls are posted enormous maps showing the layout of the routes, names of stations and on some maps, also the running times between the principal stations. A pocket-size edition of this map and running times is also available to the passenger.

On leaving the ticket window, the passenger cannot help seeing a "direction" placard. This shows the order of stations and also the "correspondences." The latter are the principal points which can be reached by transfer at various stations. A typical placard of this kind showing the stations in both directions appears on page 304.

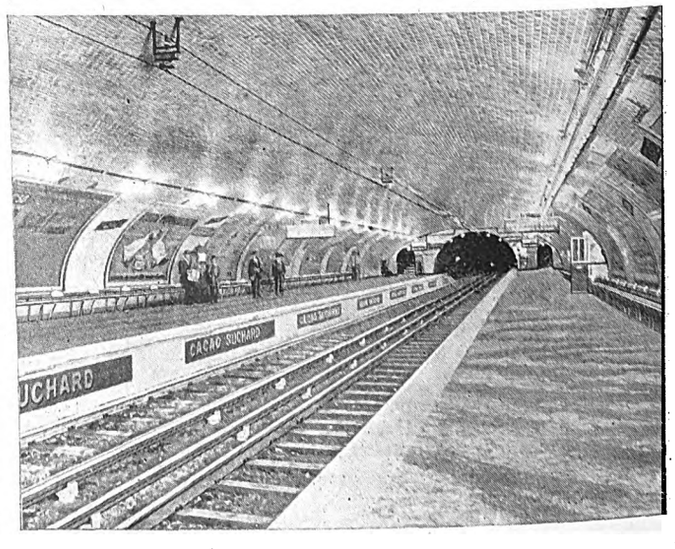
Formerly the head end of a train carried lights as destination markers, but these have long since been superseded by definite names, like "St. Gervais," in an illuminated box. In addition, the passenger is forewarned of the destination of a coming train by illuminated boxes hung over the platforms.

Inside the car he will find skeletonized maps of the route on which he is traveling.

On leaving the station he is not left in doubt as to



One of the entrances to the subway station at the Place de la Concorde



Typical elevated and underground stations of the Metropolitan Rapid Transit Lines

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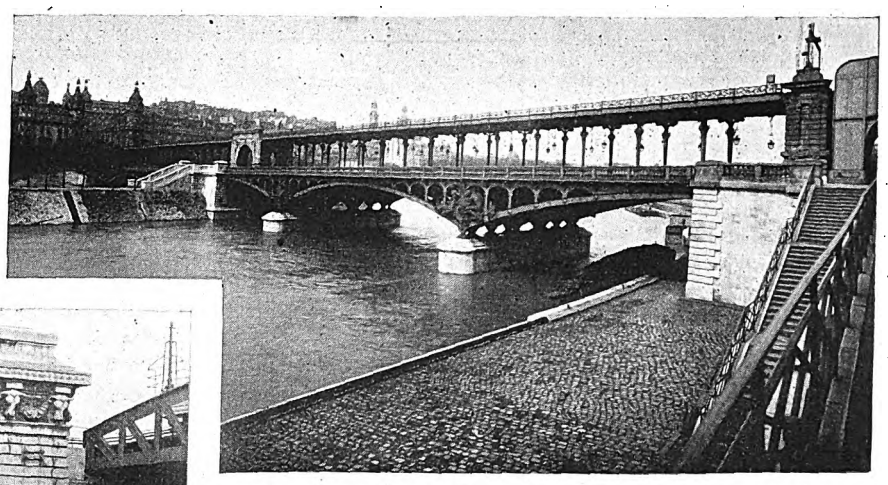
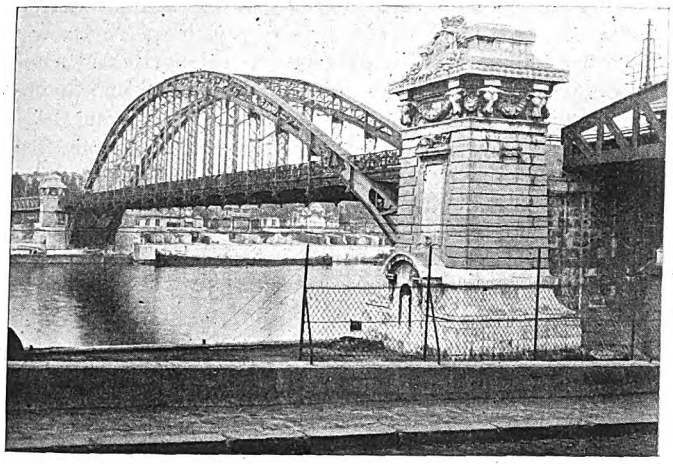
The Seine is crossed at a number of places, sometimes by tunnels and sometimes by bridges. At the points shown in these views the crossing is overhead.



Passy viaduct, with the railway on the upper level and the highway below



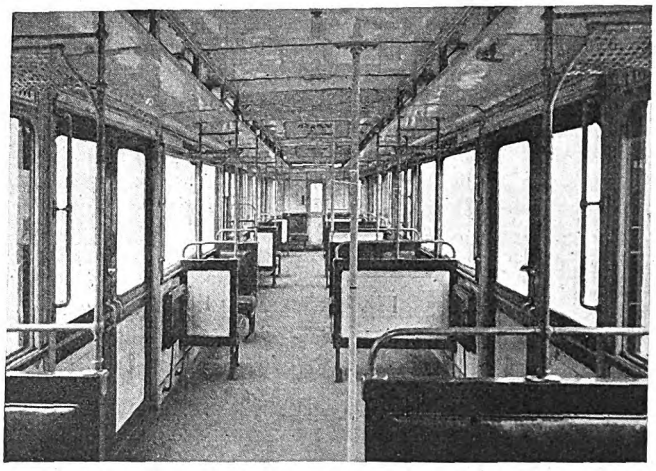
Austerlitz Bridge

which end is nearer his destination, if this destination happens to be an important traffic point. Signs at the ends of the platforms give him this information, and save considerable travel through surface congestion.

Gates have been installed to assure the minimum amount of conflicting movement in entering and leaving stations. They also avoid confusion to the stranger who might otherwise find himself traveling up side tunnels to transfer platforms, etc.

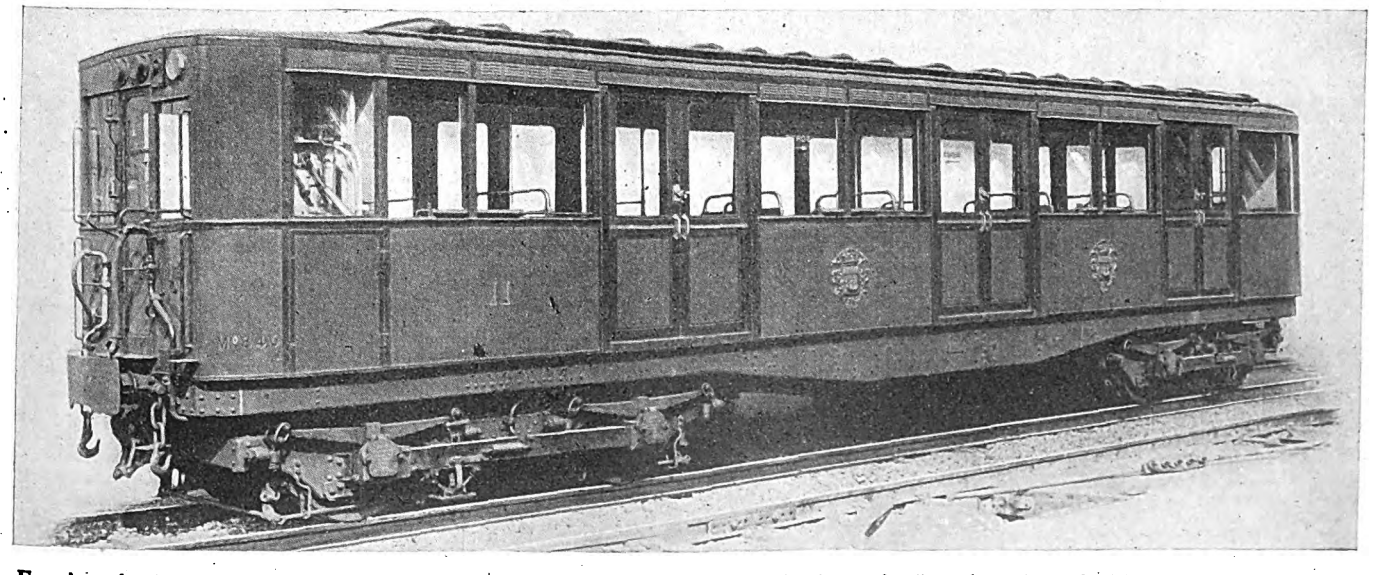
Weekday schedules are posted at all stations and show when train service begins and ends on different routes throughout the year (October to April and May to September). The last line of this placard says that Sunday and holiday schedules are varied according to public needs.

Care is taken to advise passengers of train delays.



Interior of a first-class car. Even at the higher fare charged, a considerable percentage of the passengers are expected to stand during rush hours

Enameled signs of white letters on a blue field are used for the announcements of local routes, and white letters on a red field for news of delays on connecting lines. The owl rider is kept informed by notices of the passing times of first and last trains at his station.



Exterior of a Metropolitan second class motor car. Passenger entrance and exit are facilitated by three double-sliding doors on each side. Passengers are supposed to enter by the center door and leave by the side doors, but this rule is not always followed. A feature of the exterior finish of these cars is the use of vitreous enamel for the side plates

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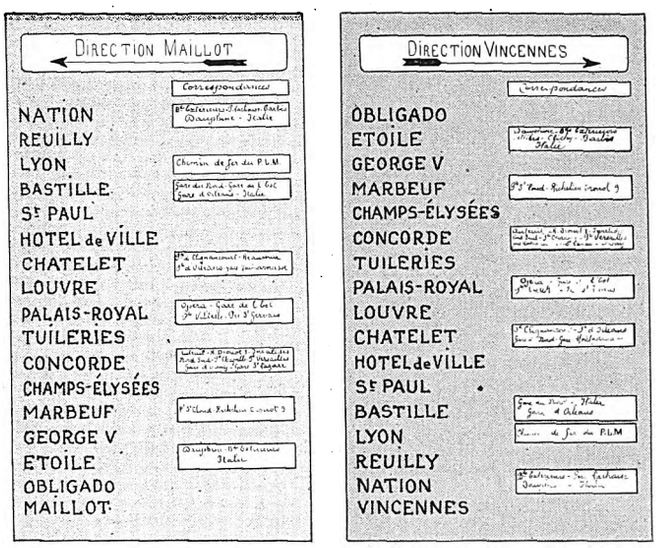

Large placques like this are displayed in each station to give the traveler the names of the stations in each direction and the principal points which can be reached by transfer from each station

A printed notice on the station walls also advises the public that complaints may be registered in a book at the station. A copy of each complaint must be forwarded to the Police Department, and the complaint must be answered within 30 days. Complaints number only five or six a day.

Extensions into the Suburbs Approved

A peculiar feature of the Paris system is that it was laid out wholly within the old city walls, which have now been changed to a broad, continuous boulevard encircling the city. The termination of the rapid transit lines at this boundary is shown clearly by the map and also by the fact that practically all line terminals are at "Portes," otherwise, gates, in the old city walls. Therefore, the Paris rapid transit system has never been able to carry the public into the suburbs as do rapid transit systems in other cities. This service has had to be left to suburban trolley connections of the city subway, bus and car routes or to the steam lines now partially electrified. Thus the State Railways (État) electrification was extended to Versailles, 18 km. (11.2 miles) from Paris on July 22, 1928.

Only recently, in fact, not until July, 1928, did the Department of the Seine agree to permit rapid transit extensions beyond the original ramparts. The aggregate length of the proposed Metropolitan extensions is 7 km. (4.4 miles). The city also approved a Nord-Sud extension toward Issy for 2 to 15 km. (1.2 to 8.1 miles) with a possible continuation to Versailles. Negotiations are also in hand to electrify the 15 km. (9.3 miles) line of the Paris-Orleans Railway to Sceaux and to electrify a second shorter portion along the Boulevard St. Michel as part of the city subway system.

In 1927, the Metropolitan operated 94.8 km. (58.8 miles), and 17.5 km. (10.0 miles) more were under construction by the city of Paris. This makes a total of 112.3 km. (69.6 miles) out of a franchise for 123 km. (76.3 miles).

In addition to this company, there is a second rapid transit company in Paris, known as the Nord-Sud. The two systems transfer between each other without charge, so that the passenger hardly knows where one begins and the other ends. It extends in a general north and south direction through the center of the city without directly paralleling any of the Metropolitan lines. During 1927, the Nord-Sud Company, as in past years, did one-fifth as much business at the "Metro."

By agreement with the city of Paris, both properties will be combined in 1931.

Gary Contest Car Arouses Interest

"HOW many passengers will this car carry in a month?" was the question borne by one of the cars of the Gary Railways, Gary, Ind., during a recent contest which gave much publicity to the company. The car, which was operated on all lines of the system during the 30-day period, is one of the new ones of the company. It has individual seats, leather upholstered. The contest was intended to stimulate interest in the new car and to secure from the patrons constructive suggestions for improving the service.

Cards, given to patrons boarding the car, explained the contest in detail and provided space for entering the patrons' guesses and suggestions. No mail answers were given consideration, the contestants being required to bring their filled-in cards to the company's office to be eligible for the prizes, totaling $100. Of 60,000 cards distributed, more than 6,000 were returned. Many helpful suggestions were made on the blanks and the company received much valuable publicity.

The car selected for the contest was operated on all lines of the system during the 30-day period

Win One of These Prizes

Gary Railways Is Offering

1st Prize for Nearest Correct Answer	$35.00
2nd Prize for Next Nearest	25.00
3rd Prize for Next Nearest	15.00
4th Prize for Next Nearest	10.00
5th Prize for Next Nearest	5.00

And Ten Prizes of One Dollar Each for the Ten Next Nearest Correct Answers

Fill Out This Blank:

My guess is that Gary Railways Car No. 19 will carry_____Passengers from January 15, 1928 until February 15, 1928

Have You a Suggestion? Write it here:

*Gary Railways can*_____

_____

Name _____

Address _____

Interior of New Gary Railways Car. The seating capacity is 54

You do not have to fill out the suggestions blank to be eligible for a Prize. Bring your answer to Room 201, Gary Railways Bldg., 11th and Broadway

(OVER)

Cards for the contest provided space for suggestions and described the new cars

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK STANDARDS—21

Central Electric Railway Association

Code of Rules*

GOVERNING THE CONDITION AND REPAIR OF FREIGHT CARS FOR THE INTERCHANGE OF TRAFFIC

Adopted by the Central Electric Railway Master Mechanics Association

These rules are formulated as a guide to the fair and proper adjustment of all questions arising between car owner and handling company with the intent of:

1. Making car owners responsible for and, therefore, chargeable with, the repairs to their cars necessitated by ordinary wear and tear in fair service and by the safety requirements of the United States safety appliance standards as applied to electric railways, and by the standards of the Central Electric Railway Master Mechanics Association.
2. Placing responsibility and providing a means of settlement for damage to any car occurring through unfair usage or improper protection by the handling company.
3. Providing an equitable basis for charging such repairs and damage.
4. Inspection of freight cars for interchange and a uniform system on which acceptance or rejection of cars offered in interchange are based.

Care of Foreign Freight Cars

Rule 1. Each railroad is responsible for the condition of all cars on its line, and must give to all equal care in handling and inspection.

Rule 2. Cars having defects for which delivering company is responsible must be properly carded when offered in interchange, as per Form 1.

EFFECTIVE JANUARY 1, 1928

Empty cars offered in interchange must be accepted if in safe condition and serviceable for some commodity that can be loaded in the car, the receiving road to be the judge.

Owners must receive their own cars,

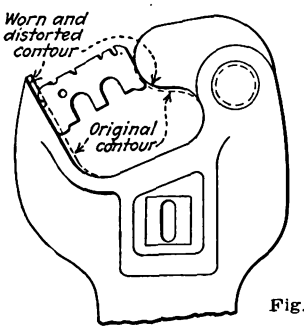

Fig. 1

when offered home for repairs at any point on their line, subject to the provisions of these rules.

Empty cars furnished on orders for specific lading must be in serviceable condition for such lading, the receiving road to be the judge. If not acceptable they must be carded with return card C.E.R.M.M.A.—Form 2.

Rule 3. Loaded cars offered in interchange must be accepted when in safe operating condition and when meeting the allowable clearances and permissible weight as determined by track, bridges and structures, with the following exceptions:

(*a*) Cars (whether loaded or empty) having defects in violation of the Safety Appliance Acts, will not be accepted in interchange.

(*b*) Cars loaded with explosives must be handled in accordance with regulations of the Interstate Commerce Commission. Cars containing inflammable liquid which is leaking must be repaired or transferred without any unnecessary movement or at nearest available point.

(*c*) Cars improperly loaded when transfer or rearrangement of lading is necessary.

(*d*) Lading of open cars when dimensions of lading are in excess of clearances of roads over which the shipment is destined, the receiving road to be the judge.

(*e*) When cars can not pass third rail or overhead clearances for electrical conductors.

(Continued on Data Sheet No. 22)

*Supersede rules and uniform charges published in Maintenance Data Sheets, Rolling Stock Standards 3 to 10 and 13 to 20 inclusive.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK STANDARDS—23

C.E.R.A. Code of Rules (Continued from Data Sheet No. 22)

nated on defect, billing repair or joint evidence cards for other parts of cars, the same uniform order of location shall govern.

Rule 12. Cars must be maintained within the limits of standard height for couplers, measured from top of rail to center line of coupler head. As far as possible, cars should be adjusted when empty. When construction of car and trucks precludes the common methods of adjusting coupler heights, the application of metal shims between journal boxes and arch bars will be permissible. The use of liners between male and female portions of center plates is prohibited where the vertical bearing surfaces are reduced. The limits of height from top of rail to center of couplers shall not be less than 31½ in. and not more than 34½ in. under any condition of loading. When bill is rendered the height of car before and after altering must be shown in billing repair card C.E.R.M.M.A.—Form 4.

Rule 13. Bills may be rendered against car owners for applying temporary transverse tie rods to cars with sides spread or bulged beyond the clearance limits of the handling line.

Rule 14. Couplers that exceed the distance of 5¼ in. between point of knuckle and guard arm, measured perpendicularly to guard arm, must have the defective part or parts renewed to bring coupler within gage, in which case owner is responsible (see accompanying Fig. 1). When couplers of another make are applied to a car, the uncoupling arrangement shall be made operative at expense of the company making repairs. But in no case shall such changes be made that will destroy the original design providing the owner wishes to change again to meet their standard.

Locking device must come within 2 in. of knuckles. Anchor must not be loose and no anchor bolts missing. No cracks or defects on knuckles or drawbars or anchors are permitted.

Rule 15. *Wheels.* (*a*) Tread thickness measured 1 in. from edge of rim shall not be less than ¾ in. (*b*) No wheels must have over ½ in. hollow tread. (*c*) Flanges not less than 1⅛ in. thick. (*d*) Treads not to be over 3⅞ in. wide or under 3 in. at any point. (*e*) Must not have chipped flanges more than ⅜ in. wide x 1½ in. long. (*f*) Steel wheels must not have a flat spot over 2 in. long and cast iron wheels must not have a flat spot over 1 in. long. (*g*) Wheels must not be less than 54 in. inside measurement at gage line.

Rule 16—*Brakes.* (*a*) Not less than 6 in. or more than 8 in. piston travel under load. (*b*) Heads, beams, pins, rods, hangers, etc., must be in good repair. (*c*) Hand brake must be efficient and in good repair.

Rule 17—*Trucks.* (*a*) Side bearings to have at least 1/16 in. clearance under load. (*b*) Center bearings must be O. K. and well lubricated.

Rule 18—*Axles.* (*a*) The total weight of car and its lading must not exceed weight given in column "A." Column "B" is the nominal capacity stenciled on all cars. Axles must be removed from service when less than the prescribed limits in columns "C," "D," "E," in table of C.E.R.M.M.A. standard axles or when the condemning limits in columns "F" and "H" are reached.

(*b*) Standard A.E.R.E.A., axles must be used in replacing A.E.R.E.A. standard axles, subject to the condemning limits for such axles.

(*c*) When second hand axles are applied, the diameter of wheel seats and centers must not be less than the limiting dimensions shown, and the diameter of the journals must be at least ⅛ in. greater than the limiting dimensions. The length of journals must not exceed ⅜ in. over standard length, the collar must not be less than 1/16 in. thick and the fillet at back end of journals on axles of 40,000 lb. capacity cars must not be less than ½ in. radius, axles of 50,000 and 60,000 lb. capacity cars not less than 5/16 in. radius, nor less than ⅜ in. radius on axles of greater capacity.

(*d*) No welding of axles is permissible except at the button which may be built up.

Rule 19—No cast iron wheels will be accepted in interchange after Jan. 1, 1930.

Rule 20—All coupling hose must be 1⅜ in. x 18 in. with F.P.5 coupling and all flexible drawbar hose must be 1⅜ in. Other sizes will not be accepted in interchange after Jan. 1, 1930.

Rule 21—*Journal.* (See accompanying sketch.) Application of packing (*a*) Inner —In packing a journal box, twist somewhat tightly a rope of packing and place it in the extreme back part of the box, as shown at "A" in the accompanying Fig 3. Make sure that it is well up against the journal so as properly to lubricate the fillet on the journal and keep out the dust.

(*b*) Main—Apply sufficient packing (preferably in one piece) to fill the space shown at "B in Fig. 3." Take care to have this packing bear evenly along full length of the lower half of the journal. The packing should not be too tight but should be tight enough to overcome any tendency to settle away from the journal. The pack-

(Continued on Data Sheet No. 24)

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK STANDARDS—22

C.E.R.A. Code of Rules (Continued from Data Sheet No. 21)

(*f*) Where roads require radial M.C.B. couplers, the rigid type will not be accepted in interchange.

Rule 4. The following defects must be repaired by receiving line while car is under load:

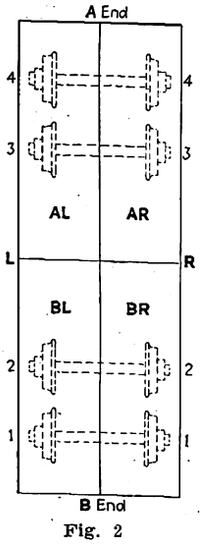

Fig. 2

(*a*) Journals are to be lubricated or repacked when necessary; when bearings are required, the same kind are to be used when possible.

(*b*) All brake rods, levers, pins, brake beams and brake shoes.

(*c*) All air hose, cocks, valves and piping.

(*d*) Couplers, worn and distorted knuckles, chains and levers used for coupling and uncoupling.

(*e*) Temporary repairs to roof when condition of same endangers lading and when such repair does not exceed 25 per cent of the roof covering.

(*f*) Missing or defective side or end doors when same endangers lading from weather or theft.

Rule 5. A bad order foreign car delivered under load, if load is transferred or unloaded within switching district, may be returned to delivering line properly side-carded on both sides showing the defects for which the car was transferred or returned, in which case it must be accepted unless the receiving line has a direct physical connection with the car owner at that point, car to be carded as per C.E.R.M.M.A.—Form 3.

Rule 6. In rejecting cars because of defects in violation of rule 3, all of the defects objected to must be designated with ink or black indelible pencil on return cards C.E.R.M.M.A.—Form 2 and placed on both sides of car.

Rule 7. No car will be accepted in interchange unless properly equipped with United States safety appliance standards as applied to electric railways.

Rule 8. If a foreign car has defects, the receiving line shall require that a defect card be securely attached to the car, as per rule 2. Defect card shall not be required for any slight damage (new or old), that of itself does not require repairs before reloading of car. Defect cards shall not be required for raked or cornered sheathing, roof canvas, bent or cornered end sill if defects are old.

At points where joint inspection is not in effect, the matter will be left to the judgment of the receiving line. Where joint interchange inspectors are employed, the decision will be made by them.

Rule 9. All cards must be of the form specified in these rules and must plainly specify each item, indicating location of defects, as provided in these rules.

Rule 10. Any car having defects which render it unsafe to run, unsafe to trainmen or any lading suitable to car, must

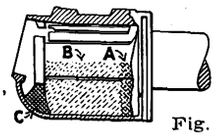

Fig. 3.

be repaired and be made safe to return to owner, billing repair card C.E.R.M.M.A.—Form 4 to be used.

Rule 11. The end of the car toward which the cylinder push rod travels shall be known as —*B*— end and the opposite end shall be known as —*A*— end. Facing —*B*— end of car, in their order on the right side of car, wheels, journal boxes and contained parts, shall be known as R1, R2, R3, R4, and similarly those on the left side of car shall be known as L1, L2, L3, L4. The same order of numbers shall be used for designating corresponding location of brake beams. In any case where right or left side is desig-

(*Continued on Data Sheet No. 23*)

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK STANDARDS—24

C.E.R.A. Code of Rules (Continued from Data Sheet No. 23)

ing should extend to approximately the center line of the journal but not above at any point, and should be pressed down evenly at sides that no loose ends may work up under the journal bearings.

(*c*) Outer—Apply a third piece of firmly twisted packing as shown at "C," and pack tightly in order to prevent displacement of the main packing. There should be no loose ends hanging out of the box as they would tend to draw out the oil.

*(*d*) Periodic repacking of journal boxes, after the expiration of twelve months, as indicated by the stenciling on car, regardless of the responsibility of handling company for change of wheels or other repairs.

*(*e*) All journal boxes shall be jacked; all journal wedges and bearings removed for examination, and renewed where necessary; all boxes cleaned and repacked with properly prepared packing (new or renovated) in accordance with C.E.R.M.M.A. recommended practice, and car stenciled. Dust guards shall be renewed, when necessary, only where wheels or journal boxes are changed.

*(*f*) The place (railroad and station), month, day and year of repacking shall be stenciled on car body near the body bolster at diagonal corners with not less than 1 in. figures and letters, using the same station initial as is used for air-brake stencil. This provision also applies to new cars.

*(*g*) No change shall be made in the stenciling unless all boxes are repacked and the work complete, in all details, has been performed.

*(*h*) If car bears no stenciling showing date of previous repacking, all boxes may, if necessary, be repacked in accordance with paragraphs (e) and (f).

*(*i*) This work shall be done only when cars are on repair track for other repairs.

*(*j*) No charge shall be made for repacking, etc., if performed within twelve months from date stenciled on car.

*(*k*) No charge shall be made for repacking, etc., unless all boxes are repacked and the work complete, in all details, has been performed.

*(*l*) Work performed, in accordance with the foregoing, may be charged to car owner at prices specified in Rules.....

*(*m*) Journal bearings having back or lug broken or cracked, or length reduced ⅛ in. or more, or lining loose, cracked, broken, spread over side or worn through to brass, shall be considered as requiring renewal.

*(*n*) Journal bearings wedges cracked, broken, or top radius worn flat lengthwise of wedge, shall be considered as requiring renewal. Care must be taken to see that wedges are not scrapped for wear unless top radius is actually worn flat.

*(*o*) The periodic repacking, etc., does not contemplate any change in the ordinary attention as to oiling and packing when necessary.

*(*p*) At time of periodic repacking inspection must be made of all axles for defects and limits of wear. If defects are found axles should be changed or owner notified on Form C.E.R.M.M.A.-1.

Rule 22. In no case shall car owner be charged for the second or subsequent applications of journal bearings if applied within 30 days from initial application at the same journal location on same road, except when renewed within such period account change of wheels or axle at same journal location, in case the application of wheels is chargeable to the owner.

Rule 23. Companies shall promptly furnish to each other, upon requisition, and forward, freight or express charges collect from point of shipment, material for repairs of their cars on foreign lines. If material is for repairs of car owner's defects, the foreign company may bill car owner for the entire freight charges, and in such case the car owner may reclaim freight charges for that portion of the movement over its own lines. If the material is for repairs of user's defects, the foreign line may reclaim only for that portion of the movement over its line.

A separate bill, with copy of freight, express or due bill attached, should be rendered for the freight or express charges showing reference to bill covering repairs.

Requisitions for such material shall specify that same is for repairs of car, giving car number and initial of such car, together with pattern number, sketch or other data to enable correct filling of requisition.

Rule 24. Repairs to foreign cars shall be promptly made, and the work shall conform in detail to the original construction, and with the quality of material originally used.

Rule 25. Any foreign road making partial or full repairs of defects on a car which is covered by a defect card, will have the defects repaired, crossed off the original card with ink or indelible pencil and card replaced on car. A copy of the card so marked should accompany the bill.

Rule 26. When repairs are made to a foreign car, card C.E.R.M.M.A.—Form 4

(*Continued on Data Sheet No. 25*)

*Effective January 1, 1929.

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK STANDARDS—25

C.E.R.A. Code of Rules (Continued from Data Sheet No. 24)

shall be used embodying the required information and reason why such repairs were required. Heads of mechanical departments will exchange memorandums in duplicate of labor and material charge plus 15 per cent applied to foreign cars during month for the purpose of having same approved so billing can be made by auditing department.

Rule 27. When repairs are made to a foreign car for which a bill will be rendered, immediately upon completion of such work a notice must be sent to the owner or C.E.R.M.M.A.—Form 4.

Rule 28. Defect cards and joint evidence cards must be securely attached to both sides of car with at least four tacks.

Rule 29. No labor to be charged for the inspection of cars, testing or adjusting brakes, adjusting angle cocks, tightening unions, bolts, bolt nuts, lag screws or spreading cotters, sill steps, and hand bolts or straightening on car, brake shafts, uncoupling levers or carrier irons when not removed from car.

Rule 30. On the first of each month, the operator will promptly forward to the owner a statement of the individual mileage operated by such owner's cars, for its information in connection with maintaining mileage records of cars and equipment of cars.

Rule 31. Delivering company is responsible for any of the following when happening on their line:

(*a*) Removing or cutting out parts of car so as to facilitate loading or unloading.

(*b*) Known theft of parts of car occurring on its lines.

(*c*) Damage to any car if caused by: (1) Derailment; (2) cornering; (3) sidewiping; (4) collision; (5) colliding with or shoving over bumping posts or other fixed obstructions; (6) overloading; (7) collapsing buildings or other structures on right of way; (8) unconcealed fire damage; (9) failure to close hoppers or drop doors before moving car; (10) improper coupling of cars; (11) improper coupling of cars at excessive speed; (12) unfair usage of equipment.

Rule 32. Damages to foreign car for which the delivering company is responsible should be repaired at once unless such damaged car is under load and can proceed to destination in conformity to rules as herein prescribed. The company responsible for the damage shall at once notify the owner and arrange how or by whom the repairs shall be made.

Rule 33. When a car having damage for which delivering line is responsible is found with other defects which are ordinarily the owner's responsibility and are not associated with delivering line defects, such fair usage defects may be repaired at car owner's expense. Reported on billing repair card Form 4.

Rule 34. When a foreign car is destroyed or badly damaged, the owner shall upon request, furnish depreciated reproduction value of car complete, and the company responsible shall have the option of repairing or settling under the depreciated reproduction value. Depreciations to be figured from the date that the car was built or if built or acquired prior to when the road came under the acts of the Interstate Commerce Commission, its value as there fixed should be used to figure from.

Rule 35. For the mutual advantage of railway companies interested, the settlement for a car owned or controlled by a railway company, when damaged or destroyed upon a private track, shall be assumed by the railway company delivering the car upon such tracks.

When a car owned or controlled by a railway company is damaged or destroyed on the tracks of a road which is not a member of the per diem rules agreement of the Central Electric Railway Association or not a subscriber to these rules, the road responsible for the per diem while in the possession of the non-subscriber shall be responsible to the owner for damages to or for the destruction of the car.

Rule 36. If the company on whose lines the car is destroyed elects to rebuild the car, the original plan of construction must be followed, and the original kind and quality of material used. No allowance shall be made for betterments not authorized by car owner.

Rule 37. When a foreign car requires general repairs such as wheels, truck frames, bolsters, broken axles, etc., for which the owner is responsible and its condition will not permit its return home, it shall be inspected by the handling line and an inspection certificate made, using Form 5 (except the joint inspection will not be necessary) covering all defects found on car, and estimated cost of repairs, total labor and total material separately.

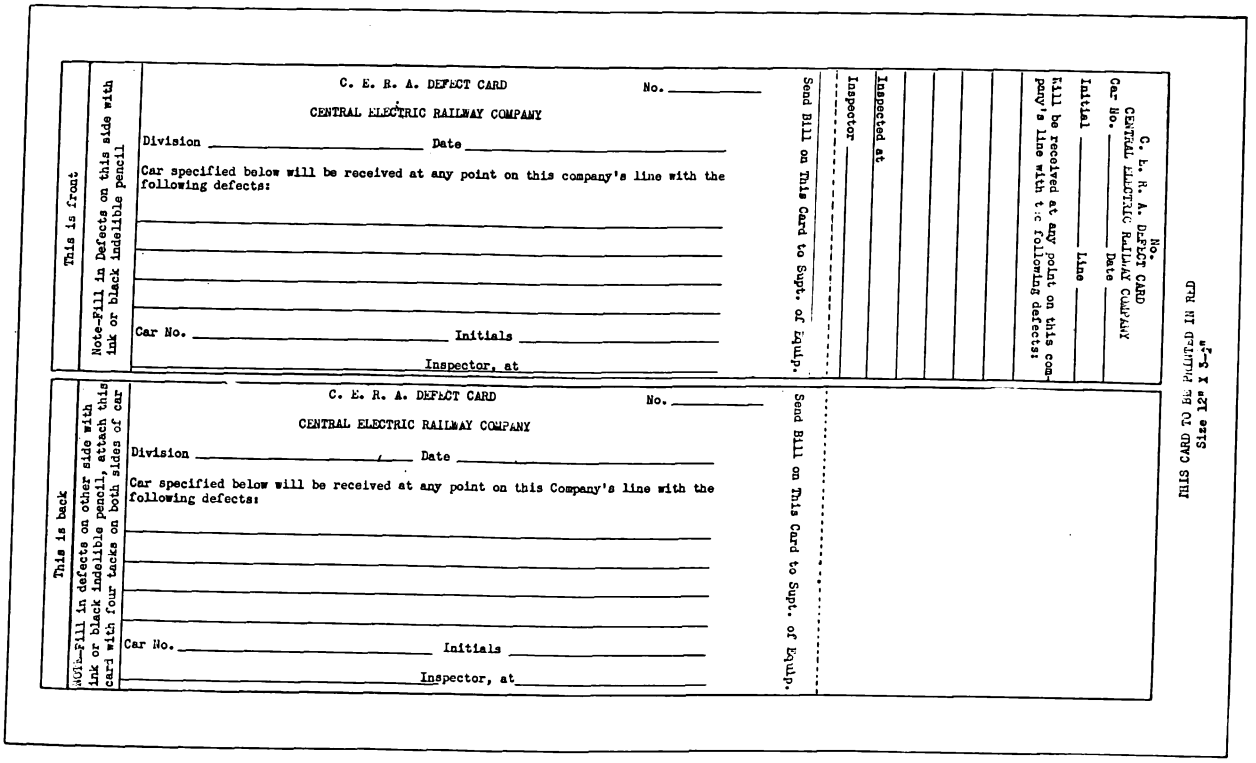
The inspection certificate shall be forwarded promptly to car owner together with list of material required to be furnished by the owner, with shipping directions. The car owner shall promptly in-

(Continued on Data Sheet No. 26)

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK STANDARDS—27

C.E.R.M.M.A. Inspection Cards



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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK STANDARDS—26

C.E.R.A. Code of Rules (Continued from Data Sheet No. 25)

spect, if he so desires. If plans or specifications are required they shall also be requested. Standard safety appliances as applying to electric railways must be completely applied.

Rule 38. Bills for repairs made under these rules and for material and labor furnished shall be in conformity with schedule of prices for the articles enumerated plus 15 per cent. Bills shall not be rendered for less than $1 but charges for a less sum than $1 may be held till they amount to that sum.

"Rule 39. In case of all parts returned to owner memo giving car number and initial and date removed must be attached to a copy of freight bill sent to owner. If not otherwise arranged for, parts will be shipped charges collect.

Rule 40. Triple valves (H-1 and H-2) to be replaced at price of new valve and defective valve returned to owner. Replaced valve may be returned to line installing same and full credit for valve allowed. Angle cocks, cutout cocks, release valves, pressure retaining valves to be replaced at the new price and defective parts returned to owner at end of calendar month.

No other credit for scrap material will be allowed as same has been deducted in prices shown herein.

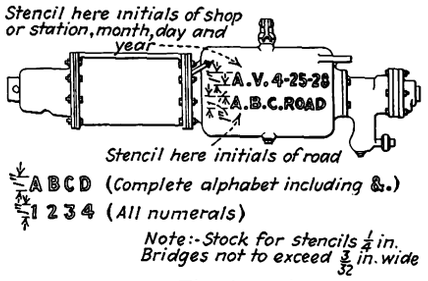


Fig. 4

If the location of marks do not present a clear view from outside of car, the stenciling must be located near handle of release rod on the reservoir side of the car.

Rule 41. Cylinders and triple valves, not cleaned within the last twelve months as shown by the standard markings. These markings are also required on new cars.

After the expiration of nine months, if car is on repair track for other repairs, the air brakes may be cleaned at same time. After the expiration of eleven months, the air brakes may be cleaned irrespective of whether car requires other repairs. Centrifugal dirt collectors should be cleaned when requiring such attention regardless of date of last air brake cleaning.

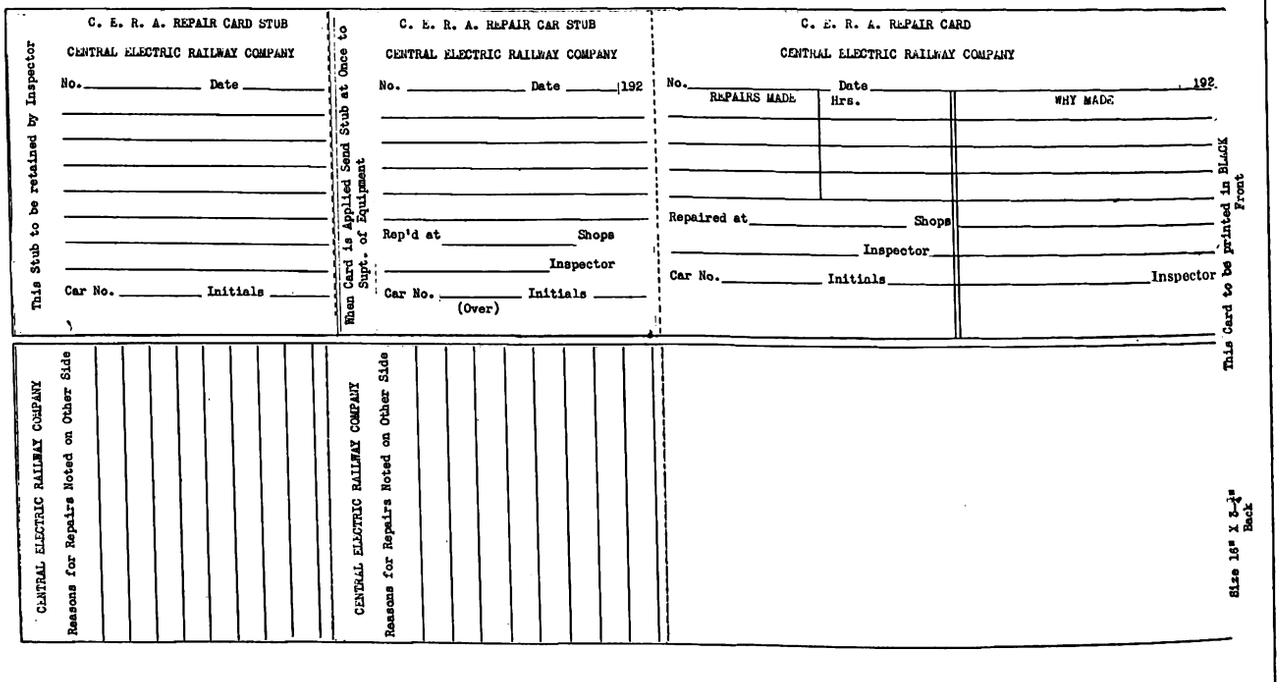
Charge is not permissible for cleaning triple valve or cylinder unless the triple valve, cylinder and centrifugal dirt collector are all cleaned at the same time. If car is not equipped with centrifugal dirt collector, original record and billing repair card must so state.

Triple valves to be cleaned must be removed from car and tested in accordance with C.E.R.M.M.A. Standard code of tests for repaired triple valves.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK STANDARDS—28

C.E.R.M.M.A. Inspection Cards



(C.E.R.M.M.A. Bad Order Card, Standard Gages and Uniform Repair Charges on Data Sheets Rolling Stock Standards 29-40 next week)

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Association Activities

Making Service More Attractive Is Concern of Wisconsin Transportation Men

EVERY electric railway property of Wisconsin, as well as most of the motor bus operators, was represented at the seventh annual meeting of the Transportation Section of the Wisconsin Utilities Association in Sheboygan last week. The convention was the largest attended of any to date, 98 registering during the two days of the meeting. Nine excellent papers, a wealth of good discussion, and an address at the closing luncheon by Lucius S. Storrs, managing director American Electric Railway Association, were high lights of the occasion.

"No community larger than a village can prosper or be an attractive place in which to live except it have a reliable public transportation service," Mr. Storrs declared with emphasis. An abstract of his address appears elsewhere in this issue.

The convention was presided over by J. H. Lucas of the Milwaukee Electric Railway & Light Company, who in a brief address stressed the fact that in every department of the transportation business there has been definite progress, both physical and mental. "Methods have been perfected for doing what was thought to be impossible a few years ago," said Mr. Lucas. "Our cars, for example, are considerably different from what they were a short time ago. The bus, the newest entry into the transportation field, has itself undergone a development so complete and so rapid that it is difficult to keep pace with it. Track and line have likewise changed so much as to alter the entire outlook of the engineers. Transportation department methods have changed no less radically. If," concluded Mr. Lucas, "we hold to high standards, do a good job, and build a reputation for service, we need have no fear for the recognition of the effort put forth."

Mayor Herman Schuelke of Sheboygan welcomed the convention, complimenting the railway men for the attention and study they are giving the problems of public transportation. C. R. Phenicie, president Wisconsin Utilities Association, responded to the Mayor.

The need of standardizing highway crossing protection was explained by L. P. Atwood, railway operating engineer of the Railroad Commission of Wisconsin. "For some time," said Mr. Atwood, "I have classified devices used at highway crossings with railroad tracks as of either a 'caution' or 'protective' type. Those of you who are railroad men will understand that a caution device may be compared with both 'caution' and 'stop and proceed' signals on the railroad, while a protective device corresponds to 'stop and stay' signals in railroad operation. In other words the caution device, sign or signal denotes only the presence of railroad tracks, and requires the highway traveler to ascertain for himself whether a train be approaching. The protective device, on the other hand, advises or warns the traveler when a train is actually approaching the crossing." After defining the various types and combinations of types of highway signals Mr. Atwood proceeded, "the uniformity in protective devices for highway crossings in a state need not necessarily be by legislation, but perhaps rather by general consent and custom on the part of the railroads, municipal authorities, and the state railroad commission. That is the manner in which such standardizing and uniformity is being developed in Wisconsin. We need the standardizing of highway crossing protection in order that the highway traveler may obtain uniformly distinctive warning, quickly observed and realized, that he is approaching railroad tracks, and must depend upon his own observations before reaching it to determine whether a train is coming. There should be these two distinctive types of warning and the devices, signs or signals giving these warnings should be as nearly uniform as may be, and distinctive from all other highway markings."

Results of three years' research study by electric railway fellowship students at the University of Wisconsin on the elimination of noises from street car operations were recapitulated by Silas B. Tobey, fellowship student of the past year, as follows:

"The modern street, the concrete one, is the noisiest, if it does not have some noise eliminators with it.

"The thermit joint will greatly reduce the noise ordinarily produced by the street cars.

"The cushioned mechanical tie is as quiet, if not more quiet, than the wood tie.

"Rail filler reduces the noise of the street car by absorbing it from the rails to a considerable extent.

"The more and the softer the seats in the car, the less will be the sound intensity in it.

"If there is insulation between the inside and the outside walls of the car much of the truck noise will be kept out.

"Finally, the point which is clear to so many, yet considered so lightly by some; that is, careful maintenance of all parts of the car, including the wheels, will bear much emphasis."

In his paper on the use of concrete in the track zone pavement, F. G. Hibbard of the Milwaukee Electric Railway & Light Company described in some detail the methods and equipment used in the handling of such work in Milwaukee. Lantern slides and moving pictures accompanied the presentation of the paper.

Of particular interest to the transportation men was the paper and demonstration of Walter J. McCarter, supervisor of training the Milwaukee Electric Railway & Light Company. Mr. McCarter outlined the methods of employee selection used by his company, and by means of a specially constructed portable test set, illustrated the psychological examination through which applicants for the positions of trainmen in Milwaukee are put. Said Mr. McCarter, "No one can predict what a man will do under a set of circumstances until that set of circumstances has been placed before him. Because of these fundamental differences in all human beings, if we are going to know each man's ability, these abilities must be tested. Testing, whether it be of a machine or of a man, is a sampling of

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Sept. 7*—Maryland Utilities Association, mid-year meeting, Braddock Hotel, Braddock Heights, Md.**

***Sept. 7-8*—Central Electric Traffic Association, Potawatomi Inn, Angola, Ind.**

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

***Sept. 25*—Central Electric Railway Master Mechanics' Association, Cleveland, Ohio.**

***Oct. 1-5*—National Safety Council, safety congress, New York, N. Y.**

***Oct. 8-12*—American Welding Society, fall meeting, Philadelphia, Pa.**

***Oct. 24-25*—Public Utilities Association of West Virginia, annual meeting, Huntington, W. Va.**

***Nov. 7-8*—Iowa Electric Railway Association, operating meeting, Roosevelt Hotel, Cedar Rapids, Iowa.**

***Nov. 21-22*—Public Utilities Association of Virginia, Hotel Roanoke, Roanoke, Va.**

***Jan. 23-25, 1929*—Electric Railway Association of Equipment Men, Southern Properties, Houston, Tex.**

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abilities. In our transportation work we cannot test the ability of a 'green' man to run a street car, but we can test his ability to learn to run it and to properly react to given situations."

The report of the accident prevention and insurance committee was presented by J. W. Oliver of the Chicago, North Shore & Milwaukee Railroad. The report consisted of information on safety work being carried on in organized fashion by four of the larger electric railways in the state. The accident prevention methods of the smaller properties are modeled along similar lines.

"Co-ordination of Transportation in Cities of 50,000 Population" was the subject of an address by L. P. Fessenden, district manager Wisconsin Power & Light Company, Sheboygan. While discussing the situation locally in particular, Mr. Fessenden said, "We realize that in order to get additional business, our schedules must be maintained, cars and coaches kept clean and attractive, and the public treated with the courtesy which they have the right to expect. To insure the latter, our employees are picked with care, are schooled on what constitutes politeness to our patrons, and are watched for lapses which through carelessness might occur."

A discussion of transportation problems in general was led by Nels C. Rasmussen of the Wisconsin Valley Electric Company, Wausau, and Clyde L. Hedges, Mississippi Valley Public Service Company, LaCrosse, as an after-luncheon program on the first day.

Operating results of the light-weight city railway car of the Chicago & Joliet Electric Railway, which was exhibited at the 1927 convention of the American Electric Railway Association in Cleveland, were discussed at some length in a paper by A. W. Baumgarten, division engineer of the company. This car was put through a series of special tests during last November and December in order to determine accurately its general operating characteristics. Since Feb. 1 the car has been in regular city service and a brief review of the service results to date were included in Mr. Baumgarten's report.

"Air Brake Installation and Maintenance" was the subject of a paper by Kenneth M. Wilkins of the Chicago, North Shore & Milwaukee Railroad. Following a review of the history of the development of retarding devices for vehicles, Mr. Wilkins took up in detail the approved methods of installation, inspection, and overhauling of modern air brakes. Concluding, Mr. Wilkins emphasized that with the frequent service of today, using heavy equipment with speeds varying from low to high over short distances, railways must have a brake that is durable, flexible, and always instantly responsive. To obtain these features, he pointed out, railway men should become thoroughly acquainted with the modern braking equipment and the means of handling it to the best advantage.

Recent developments in motors and car equipments were discussed by R. A. Hutchins, General Electric Company. Lantern slides were used to illustrate the newest types of resistors, controller fingers, motor-generator sets, modified automotive type drive for street cars, and details of new methods of ventilating heavy duty railway motors.

A paper "Therapeutics of Railway Equipment" discussing in a semi-facetious manner various ailments to which street railway cars are sometimes subject, and the general methods of treatment to be employed in curing them, was presented by John S. Dean, renewal parts engineer Westinghouse Electric & Manufacturing Company, and brought vociferous applause from an appreciative audience. To quote Mr. Dean, "Railway equipment is subject to many chronic ills and painful disorders which must be properly diagnosed and scientifically treated by the Maintenance Doctor (M.D.) who is commonly known as the master mechanic.

"The traveling public appreciate this condition, as it is apparent in many cities that some cars as they come rambling down the streets seem to be afflicted with rickets or locomotor ataxia and in the advanced stages of the yellow jaundice.

"The various diseases affecting railway equipment are discussed from a medico-mechanical viewpoint to help properly diagnose and remedy the disorders. This information should help the master mechanic to apply the proper counter-irritants, innoculate the patient with the correct anti-toxins or vaccines to give immediate relief and insure a speedy convalescence."

The annual banquet of the Transportation Section was held at Siebkins' Hotel, Elkhart Lake, near Sheboygan, on Thursday evening, with B. W. Arnold, in charge of motor bus transportation of the Chicago, North Shore & Milwaukee Railroad, as master of ceremonies. In addition to short talks by many of the "headliners" in attendance at the convention, Madame Elsa Behlert Bauer, former Berlin grand opera singer, sang several selections that were received with applause.

Henry Cordell of the Chicago, North Shore & Milwaukee Railroad was elected to succeed J. H. Lucas of Milwaukee as chairman of the Transportation Section for the forthcoming year. The place of the next meeting is expected to be Green Bay, the home of George Biebel, superintendent of railways Wisconsin Public Service Corporation, who was elected vice-chairman.

An Every-Day-in-the-Year Service*

By Lucius S. Storrs
Managing Director American Electric Railway Association

THE time can never come when the city dweller can always depend upon his own private vehicle to supply him with all the transportation he and his family and guests may need. Therefore, public necessity and convenience require a transportation service available to everybody every day in the year; without such a service the public is seriously handicapped.

In these days of rapid transportation, when the steam railroads are preparing to use the airplane as a supplementary vehicle in super rapid transcontinental service, when air mail is commonly used, when automobiles fill our highways and block our streets, when "pep" and speed seem to dominate men's minds, it is understandable that people who have not given the subject as careful study as we have given it should reach some false conclusions relative to local transportation in the future.

To some of these people it seems as if the days of usefulness of the electric street car were nearing an end. They point to the 25,000,000 passenger automobiles operating in the United States, the thousands of buses giving service, and declare that even these shall pass away and the air "flivver" or "air bus" will take their place. To such people we can only say that they reckon without understanding. Mass transportation is a science of itself.

Enthusiasm is a large factor in developing false conclusions. The inventor of a device or the discoverer of a new principle sees it revolutionizing the world. He sees it relegating to oblivion tried and true tools, methods, systems, ideas and policies. Yet as time goes on humanity finds not only a place for the new idea or invention, but also finds that it must continue to use the very thing the new idea was supposed to supersede.

Radio has not supplanted the cable and telegraph. Automobiles have not exterminated the horse. Oil has not replaced coal, aluminum has not taken the place of steel, chromium has not made obsolete the nickel plating industry. Experience has proved that the electric street car in mass transportation is as necessary to day as it was ten years ago. Private transportation has reached the maximum of convenient use in daily urban service. The bus has been adopted as a valuable auxiliary vehicle by the railways, and public policy in most places is against permitting competitive bus operations which would hamper established transportation companies in giving their necessary public service.

It is the public realization of the need of dependable transportation service that is the best insurance the public transportation industry can have. Some such service is absolutely necessary to every community larger than a village. The kind of service to be rendered will be determined by the characteristics of the communities. If a taxi-cab service is all that is necessary, then a taxi-cab

*Abstract of a paper presented at the meeting of the Transportation Section of the Wisconsin Utilities Association, Sheboygan, Wis., Aug. 16-17, 1928.

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service is all that will be given. If a bus service is sufficient, then buses will render the service. If electric railways give the most efficient and economical service, then electric railways will continue to serve the communities.

Some of you men who are operating in Wisconsin have been surprised that street railways operating in larger communities than your own have not earned so much net income as your companies. The reason for this is to be found in the different conditions obtaining in the different communities. One town is a "good" railway town, another may not be so good. Much depends on the topography of the territory served, the habits of the people and the enterprises carried on in the communities. The wise transportation man will make a careful survey of the needs of his community from the standpoint of present-day conditions and will try to fill them most satisfactorily to the public.

There have been many instances of communities, faced with the loss of electric railway service, refusing to accept a substitute. I know electric railway operators who substituted buses for rail operations in small towns and later on wished they had not. I also know of communities, where, in my judgment, the public would be better served and the company would save money were buses to be operated rather than street cars. I know of communities that have not yet learned that the public interest and that of the transportation company are one and the same.

The need for public transportation is not going to decrease as time goes on. It will become greater. But we must see to it that the particular type of service that is most desirable is offered and then insist upon ample compensation. The skill with which the operating men are conducting the electric railways is little short of marvelous. The economies that have been effected have been tremendous. The opportunities for future savings are large. We are in hopes that the modernization movement, the salesmanship spirit, the continuous development of co-operation between company and community will bring about the increase in traffic that will assure the increase in net income that makes an enterprise attractive to capital.

American Association News

A Less Serious Side

WHILE the purpose of the Cleveland convention is serious, according to a letter sent out by President R. P. Stevens, there will be entertainment and fun that will make the gathering attractive to the ladies. Cleveland's beautiful Public Auditorium, with its recent additions, is an ideal place for large social affairs, and the entertainment committee is going to take full advantage of its facilities.

There will be special entertainment features, dancing, bridge parties, sightseeing trips and other attractions that will appeal to the wives, daughters, aunts, sisters and children of the delegates. President Stevens hopes that a large number of ladies will be present and that they will get acquainted with one another. The entertainment features serve as an opportunity for this. The contacts thus made are worth more than the expense of going to the convention.

Details of the entertainment program are not yet ready to be announced, but Mr. Stevens in his letter gives assurance that they will be most attractive.

Fiddlers and Trumpeters in Cleveland

SO THAT no well-balanced delegate will entertain the notion that the 1928 convention in Cleveland will be all committee reports, exhibits and educational conferences comes the news that "B. A." will be in Cleveland with his trumpeters and fiddlers. For the benefit of those who do not know "B. A." it should be explained that Mr. B. A. Rolfe is a showman, a business man and superlatively a musician. With his famous Palais d'Or Orchestra he is going to straighten out these always querying and occasionally querulous railway officials on the position of jazz in the music world. To him it's the comedy of music.

At any rate B. A. Rolfe has had an interesting career from the time he was eleven, when he toured Europe as a boy trumpet wonder, to his more recent flings with high-grade vaudeville acts and movies. Even such enticing pursuits produced only a normal pulse so he returned to his old love—Music—and today he ranks with the best of the orchestra leaders of popular music on the concert stage or "over the air."

Subsequent announcement will acquaint convention visitors of the time of his appearance. Don't look for long hair, black tie and other marks of the artistic temperament. He looks like a banker, but he plays the trumpet on a super treble register. There's a secret to that though—perhaps a delegate will pry into it.

B. A. Rolfe and his WEAF orchestra will furnish the music

A.E.R.A. Golf Tournament

MEMBERS of the American Electric Railway Association are all invited to participate in the golf tournament on Sunday, Sept. 23, 1928, in Cleveland, Ohio. This is a special entertainment feature of the 47th annual convention of the association.

The tournament will be played at the Hawthorne Valley Country Club, one of the new scenic golf clubs in the district. Arrangements have been made for starting time from 11 a.m. on, to accommodate as many players as are entered.

The tournament will be eighteen holes medal play and prizes will be awarded to the low gross winner and runner-up, low net winner and runner-up, as well as several others yet to be selected.

Entries should be mailed at once to R. W. Emerson, vice-president Cleveland Railway, Cleveland, Ohio, with the following:

1. Name and address.
2. The club of which you are a member.
3. Club handicap or five lowest scores.
4. Par for the course you play.
5. Other members of your foursome if it is made up.
6. Hotel at which you will stay in Cleveland.
7. Entry fee of $3.

Motor coaches will leave from the Hollenden, Statler, Cleveland and Winton Hotels at 10 a.m., and will take the players to the course, returning after the tournament. The clubhouse is not completed, hence players cannot be serviced either with lockers or food at the course.

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News of the Industry

First Move by Detroit Municipal to Make Service Metropolitan

On Sunday, Aug. 19, the Fort Street car line of the Detroit Municipal Railway, Detroit, Mich., was extended to Wyandotte, a suburb of Detroit, approximately 7 miles from the westerly limits of the city.

This extension of service, together with that recently started to Farmington, constitutes the first move in the expansion program to render transportation service to the entire metropolitan area of Detroit.

These extensions have been made possible as a result of negotiations with the Detroit United Railway, which owns that portion of the track beyond the city limits.

Fares are collected under a zone system, there being four distinct zones between the city limits and Wyandotte, with a minimum fare of 10 cents for a ride in any zone, and a through fare of 25 cents for the entire trip.

A through service is maintained over this line at fifteen-minute intervals during the day, with a 7½-minute headway during the morning peak period and a 10½-minute headway during the evening peak.

This through service by railway supplants a bus service formerly rendered by the Detroit United Railway. It is meeting with the whole-hearted approval of the residents of the neighboring municipality.

Revocable Permit Suggested in San Francisco

Samuel Kahn, president of the Market Street Railway, San Francisco, Cal., in a letter to the citizens' transportations committee, says the company will accept proposals to surrender its franchises, some of which have only a short time to run before they mature, to the city in return for revokable operating permits if the city will continue such permits until it is ready to take over the lines. In such an event the company will not claim going concern values in price adjustment. Mr. Kahn's letter follows in part:

A short time after we assumed the management and control of the Market Street Railway we announced publicly that we acquired the property to develop a transportation system second to none in this country. The improvements in service and property, the comfort, care and courtesy of operation and the new features originating under our direction have commanded the attention not only of our patrons but the transportation world as well.

In the brief space of 2½ years we have accomplished much for the car rider, and it is our purpose to continue our policy of improvement. It is for the citizens to say whether or not they want us to continue in this constructive work, for we also announced publicly that if the people of San Francisco wanted the Market Street Railway they could have it at any time, irrespective of franchise expirations, as we believed some mutually satisfactory plan could be evolved toward that end.

It seems to us that the proposed charter amendment is in accord with our promises and, therefore, we have no choice in the matter other than to subscribe to it, and we hereby do so.

Referring to that part of your letter that deals with going concern value, we wish to state that if the proposed charter amendment carries and we take a revocable permit thereunder, we shall make no claim for any such value in the event the city subsequently exercises its right to revoke the permit for the purpose of acquiring our property.

Franchise Committee Named in Jacksonville

At the session of the City Council of Jacksonville, Fla., on Aug. 14 a committee of five members was appointed to confer with representatives of the Jacksonville Traction Company and the city attorney on terms for the proposed new franchise for the company. The committee is headed by Councilman Edward S. Hemphill, vice-president of the Council. Other members are James C. Merrill, Albert E. Barrs, T. S. Adams and W. H. Rowton. Councilman Hemphill is out of the city, and a date for a meeting of the committee with the company representatives and the city attorney will not be set until his return.

Another Move in Columbia Case

Special referee declares railway cannot be compelled to resume service. Hectic controversy dates back to 1922

TO COMPEL the Broad River Power Company, or its subsidiary, the Columbia Railway, Gas & Electric Company, to restore railway service in Columbia, S. C., would violate the fundamental law of the land as declared in both the state and federal constitutions. So declares L. D. Lide, special referee appointed by the Supreme Court of South Carolina, in his report to the court, filed on Aug. 17. The referee recommends to the court that all petitions be dismissed.

The report takes up 70 type-written pages. In it the referee reviews the history of the litigation. The original petition by Attorney General John M. Daniel was filed on July 19, 1927, at which time an order to show cause was issued. Subsequently, pursuant to orders granted at various times, the Railroad Commission, the North Columbia Land Company, the City of Columbia, W. B. Burney, Columbia College, Chicora College, the Columbia School Board and the towns of Eau Claire and Arden were allowed to come into the cause by intervention petitions.

Demurrers to the main petition and the intervention petitions were filed by the power company and returns and answers were filed by them. The petitioners moved to strike out the returns and demurrers and also filed a reply. After the cause had been argued before the Supreme Court upon the pleadings and certain documentary evidence an order was handed down by the Supreme Court, dated Jan. 11, 1928, referring it to Mr. Lide as referee.

The referee ordered a reference for Jan. 25, 1928, but after the order was passed by the referee the Columbia Railway, Gas & Electric Company was adjudicated a bankrupt upon its voluntary petition by order of Judge Ernest F. Cochran, judge of the United States Distirct Court, dated Jan. 24, 1928. On the same day Judge Cochran issued a rule to show cause, temporarily staying the mandamus proceeding.

In compliance with this order the reference was adjourned and on Feb. 2, 1928, Judge Cochran handed down another order continuing the stay, with the stipulation that the petitioners might apply to the Supreme Court for such construction or amendment to the pleadings or might institute such new actions or proceedings as would permit them to

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any of them to proceed against the power companies, other than the alleged bankrupt, for any relief which should not affect the property or railway system of the alleged bankrupt.

Counsel for the petitioners made a motion before the Supreme Court for such amendment or construction of their pleadings. This resulted in an order of the court dated Feb. 17, 1928, in which the referee was directed to proceed under a construction of the action as one for relief against the Broad River Power Company and F. D. Campbell, but "not affecting the Columbia Railway, Gas & Electric Company or its property."

Pursuant to this order a reference was held, lasting for several days. At this reference the petitioners introduced much documentary evidence and a considerable volume of oral testimony. The power companies then offered no testimony, saying that without regard to the various defenses to the merits of the proceedings, the court could not grant a writ of mandamus against them, other than the alleged bankrupt, without infringing upon both the federal court order and the order of the Supreme Court. The referee set March 27, 1928, for argument of counsel before him.

However, the adjudication in bankruptcy was vacated by Judge Cochran on March 13, 1928, upon the ground that it came within the term "railroad corporation" as used in the Bankruptcy Act, filing his opinion on April 2, 1928, dissolving the stay order. The Supreme Court thereupon ordered, April 12, that the parties be authorized to proceed under the original pleadings and proceedings.

Judge Cochran's order vacating the adjudication in bankrupty and revoking the stay order was affirmed by the Circuit Court of Appeals at Richmond, Va., this court's opinion being filed on June 12, 1928. In the meantime the referee ordered another reference which began on May 22.

The report of the referee is not a decision of the case, but is merely a report to the Supreme Court for its information. However, it is thought that Mr. Lide's findings in the matter will bear considerable weight with the court in its deliberations.

The Columbia Street Railway was incorporated by an act of the South Carolina Legislature passed in 1882. The act provided for the franchise to remain in force 30 years, provided the operation be started within five years. On authority from City Council railway operation by horses was begun on the streets of Columbia in 1886, under regulations of Council. Through various consolidations and mergers the company became the Columbia Electric Street Railway on Sept. 13, 1892, and began operating electric cars.

On May 18, 1911, the name was changed to the Columbia Railway, Gas & Electric Company with an increase in capital stock. After 1907, various suburban companies constructed railway lines which were later consolidated with the Columbia Railway, Gas & Electric Company.

In 1922 motormen and conductors went on strike and the operation of cars was suspended for two or three weeks. After the strike the company refused to re-employ the men and refused to recognize the union. The union men organized a "jitney" service. This materially cut into the revenue of the company, but railway service was continued until June, 1926, when several lines were discontinued temporarily under orders by the Railroad Commission. In 1924 the company came under the control of the W. S. Barstow interests and two companies were created: the Broad River Power Company and the original company, the latter retaining the railway property only. The charter for the new company was granted on July 19, 1924.

Continued losses in operations led to various experiments in fares being permitted by the Railroad Commission. Finally the company was authorized to discontinue several more lines temporarily. All orders, the report says, were observed by the company until March 11, 1927, when the entire railway system was discontinued without the authority of the Railroad Commission or any other public body. The commission ordered the company to show cause why it should not be penalized and issued an order March 18, 1927, requiring the restoration of the limited service in effect theretofore.

After a hearing, in which the Carolina Transit Company, a competitive bus company, was also a party, the commission issued an order on April 7, 1927, permitting the discontinuance. The Attorney General filed a petition for a rehearing and the commission reversed its decision on July 28, 1927, and ordered the restoration of service within twenty days.

Following this, numerous resolutions were passed by the City Council. These and the court actions previously reviewed have all featured Columbia's street railway situation. It is expected that a prompt opinion by the Supreme Court will settle finally a trying transportation problem which has lasted since 1922.

Helpful Leads on New Business

"The 57 Big Advantages of Sunset Line Service" is the title of a new twelve-page folder dealing with the co-ordinated rail and motor coach services of the Chicago, Aurora & Elgin Railroad which has been distributed to employees of the company. The new booklet is put up in handy pocket size ($3\frac{1}{2}$x$8\frac{1}{4}$ in.). It conveniently lists the principal talking points which can be used by employees in selling the company's service to the public. Connections with other railroads and points of interest along the line are likewise listed for ready reference. Other information useful to the average employee, acting in the role of salesman, appears under the head of "Helpful Leads on New Business."

Demand Is Made that Kansas Commission Be Abolished

Clyde M. Reed, Republican nominee for Governor of Kansas and former head of the Public Utilities Commission, has met charges that the commission had been a total failure with the suggestion that it be given an additional four years' trial and then abolished if it failed to come up to expectations. He is opposed to the removal of first-class cities from the commission's jurisdiction while that body is in existence.

Peter Witt Loses Gubernatorial Nomination

Peter Witt, former street railway commissioner of Cleveland, Ohio, and inventor of the Peter Witt car, lost his fight for the Democratic nomination for Governor at the Ohio primaries on Aug. 14. Congressman Martin L. Davey, of Kent, who had the indorsement of the Anti-Saloon League, defeated Mr. Witt by approximately 40,000 votes, although in his home county Mr. Witt polled 31,672 votes to Mr. Davey's 2,954. Mr. Witt's principal issue was the one of supporting Alfred E. Smith.

Skip-Stop Plan for St. Louis Defended

The St. Louis Public Service Company, St. Louis, Mo., in advertisements inserted in the St. Louis newspapers, has defended the company's position in insisting upon the continuation of the skip-stop plan of operating its Olive Street divisions between Twelfth Boulevard and Channing Avenue, a distance of 22 blocks.

The ads point out that by eliminating 80 needless stops on various divisions and by the introduction of other time-saving measures the average speed of street cars in St. Louis has been increased during the past four months from 9.4 m.p.h. to 10.1 m.p.h.

St. Louis must be put ahead and not behind other cities, the ad states. It points out that the average speed of cars in Chicago is 11.2 m.p.h.; Cleveland,, 10.5 m.p.h.; Boston, 10.5 m.p.h.; and Washington 10.2 m.p.h. The ad says:

> The average distance between stops in St. Louis is 504 ft., Chicago 660, Cleveland 750, Boston 800 and Washington 660. Years ago the mule-drawn car stopped anywhere to take on a passenger. The desire of the individual determined the policy of the driver. Today the greatest good for the majority must be the only consideration. The selective stop system is one of the principal avenues open for street railways to meet the demand for speed.

When the paving of the widened Olive Street thoroughfare was started weeks ago Director Brooks asked the company to adopt the skip-stop plan as a safety measure and to speed up the construction work. In a recent vote conducted on the street cars 72 per cent of the votes cast were for the skip-stop plan.

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Change in Roanoke Fares Allowed

Under an order of the Public Service Commission, all of the changes sought by the Roanoke Railway & Electric Company, Roanoke, Va., have been allowed, with three minor modifications. The most important of these was to make the second fare zone extend between Fairview and Lakeside, instead of between Fairview and Edgewood, as requested by the company.

Zone one includes all lines in Vinton and Roanoke and its suburbs east of Fairview, and zone three from Lakeside to and including Salem.

The 7-cent fare or a token, four of which will be sold for 25 cents, permits one continuous ride between any two points in zone one, with free transfer within the zone when necessary.

The commission has also authorized the company to issue a $1 transferable pass, entitling the holder to unlimited transportation in zone one for a period of seven consecutive days, beginning midnight every Sunday.

A book of twelve tickets will be sold for $1.50, under the commission's order, and will entitle any member of one family to ride between Roanoke or Vinton and Salem. It will be good until used. Round-trip tickets will be sold for 35 cents, and will entitle the holder to continuous rides each way on through cars running between Roanoke or Vinton and Salem.

No Concession to Tacoma Municipal Employees

The City Council of Tacoma, Wash., has approved the recommendation of Commissioner Ira S. Davisson that the request of municipal belt line employees for a monthly basis of pay be refused. The commissioner reasoned that the change would mean a material increase in the cost of operating the line. The Council has turned over to the commissioner a request from the Tacoma school board that it be allowed to contract with the city for transportation of children from northeast Tacoma on the same terms as last year. It is stated the school children were carried at a loss last year. Transportation was by bus on the hill to connect with the railway across the tideflats.

Helping the Boys to Help Themselves

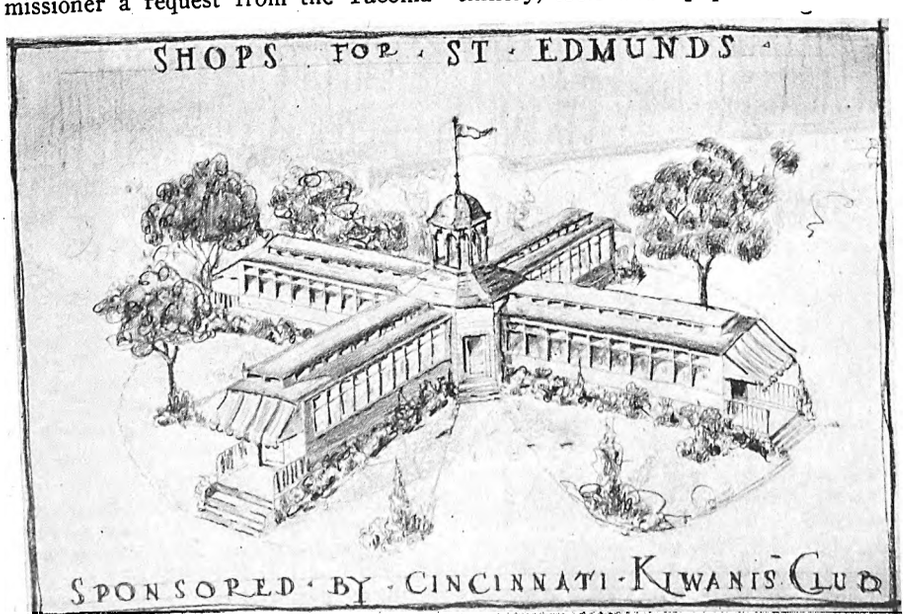
A suggestion to other electric railways is offered in the plan to convert four cars of the Cincinnati Street Railway, Cincinnati, Ohio, into a machine shop and industrial school for the boys of St. Edmund's School, at Glendale, made by the members of the Kiwanis Club of Cincinnati.

As indicated in ELECTRIC RAILWAY JOURNAL for Aug. 11, page 234, the cars are to be hauled to the Glendale site by members of the Kiwanis, who will make a holiday in which to volunteer for service in mounting them upon concrete pedestals and fitting them up in the form of a Maltese cross, with an attractive cupola in the center.

Eric Gibberd, formerly advertising manager for Mablew & Carew, who gave up a career as an advertising man to devote his life to 33 under-privileged boys ranging from ten to sixteen years of age, is a member of the Kiwanis Club and the club sponsored the plan to build the machine shop as a testimonial to the worth of their fellow member.

The converted cars will make a building 70 ft. through the center and 8 ft. wide. One of the cars is to be turned into a woodwork room; another into a metal machine shop; another into a clay modeling and electric shop, and the fourth will be used as a school room in which members of the Kiwanis Club and others will instruct the boys in useful trades.

The longitudinal seats of the cars will be converted into work benches. Members of the club will donate machinery, tools and equipment.



Drawing showing plan for boy's paradise at Cincinnati

New Bills Being Drafted in Chicago

Drafting of an entire new set of legislative bills to facilitate settlement of the local transportation problem in Chicago was ordered recently by the transit sub-committee of the Chicago City Council. The proposed measures, which will include two or three alternative plans, will be drawn up by Assistant Corporation Counsel John G. Drennan.

The new bills are to include a home-rule measure, a terminable permit bill and an amendment to the present Mueller law to permit the city to buy local transportation lines which might extend their service beyond the city limits. At present, the city has only the right to purchase lines operated wholly within the city. Two separate propositions will be offered in the home-rule bills which Mr. Drennan is to prepare, one creating a metropolitan transit commission with jurisdiction over all the local transportation systems in Cook County. The other will provide for a commission having regulatory powers over only those lines which the city will have the right to purchase under the proposed ordinance.

No bill authorizing the consolidation of the local transit systems—a plan around which previous legislative traction programs have been built—is to be drawn until the matter is agreed upon between the sub-committee and representatives of the several companies.

New Fares in East Cleveland Protested

The recent award by a board of arbitration of a 9-cent fare to the Cleveland Railway in East Cleveland, Ohio, has been attacked in a suit filed by an East Cleveland citizen based on the ground that the East Cleveland commission did not have the right to delegate the fixing of a rate of fare to a board of arbitrators, as provided in the East Cleveland franchise.

The Cleveland Railway is expected to contest the suit on the ground that the original East Cleveland franchise ordinance, providing for a revision of fare every five years, was ratified by the people at a referendum vote and that no objection was made to the arbitration clause of the franchise at the last five-year revision period in 1923.

The East Cleveland fare is based on a differential above the Cleveland rate, the differential rising or falling as the Cleveland rate changes. The differential at the present Cleveland rate is 2 cents.

Cleveland Heights, another suburb of Cleveland, has been dickering for several years for a new franchise embodying extensions. The Heights officials about a year ago agreed to a 1-cent differential, but the Cleveland Council refused to ratify the franchise. It is reported now that the Heights Council will agree soon to the same differential in effect in East Cleveland. This will put all large suburbs of Cleveland, except Lakewood, on a service-at-cost basis.

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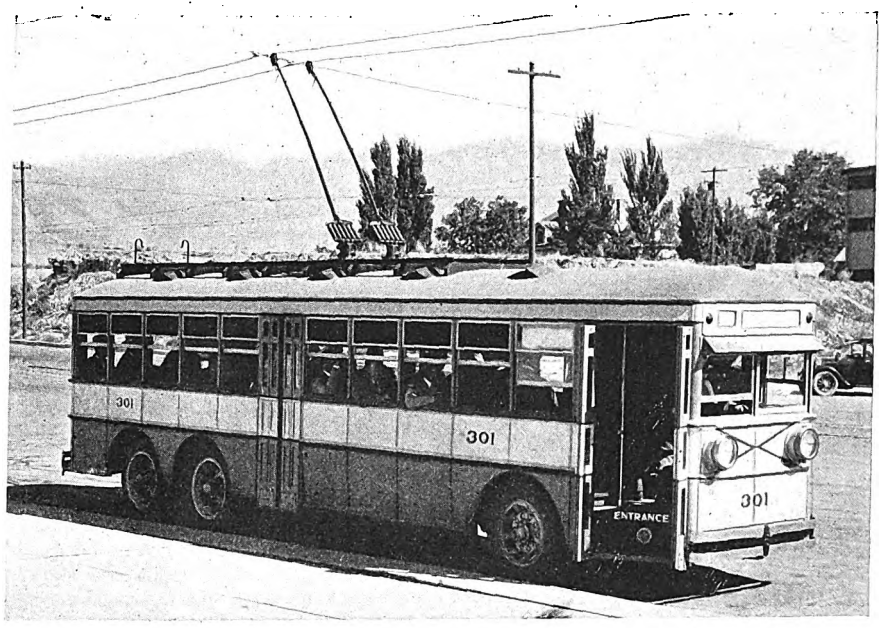
Electric Coach Tried in Salt Lake City

Citizens of Salt Lake City received their first glimpse of one of the ten new electric coaches soon to be placed in regular service by the Utah Light & Traction Company, when a trial run was made on the afternoon of Aug. 20. Governor George Dern of the state of Utah, Mayor John F. Bowman of Salt Lake City, and a number of other state and city officials, together with directors and officers of the railway and members of the Salt Lake City Chamber of Commerce were passengers on the initial trip. The proposed route of the new electric coaches, known as the Fourth East line, was fully traversed. The trial was very successful, according to those who rode in the coach, and demonstrated the practicability of the new type of vehicle.

Regular operation on the line, which extends north on Fourth East from Twenty-first South to Seventh South through a residential section, west on Seventh South to Main Street, north on Main Street to Second North through the heart of the business section, and then east on Second North to the state capitol through another residential section, will be started early in September, it is expected. The ten coaches were manufactured by the Versare Corporation, Albany, N. Y.



State, city and railway officials were passengers on the trial run of the first of the Salt Lake City electric coaches

Air-Interurban Travel Popular

During the first two months of operation a large number of Ohioans have taken advantage of the experiment in the co-ordination of electric railway and airplane service. This innovation was undertaken by the Cleveland Southwestern Railway & Light Company, which operates interurban service from Mansfield and other cities to Cleveland. As explained previously in ELECTRIC RAILWAY JOURNAL tickets are sold by the electric railway which provide for a fast ride on one of the company's de luxe cars to the Cleveland airport. There immediate connections are made with a tri-motor plane service to Detroit. This enables persons living along the company's lines to leave their homes in the morning, travel to Cleveland by interurban and to Detroit by air, and return in the same manner on the same day.

City to Re-lay Rails After Completing Poughkeepsie Sewer

Agreement has been reached between the Poughkeepsie City & Wappingers Falls Electric Railway, Poughkeepsie, N. Y., and the Common Council by which the city agrees to pay the cost of relaying the rails in Market Street after the new sewer is installed. The plan to take the rails out of Market Street and suspend service a month while a new sewer is laid preliminary to paving was agreed upon only after long negotiations between city officials and representatives of the company. It was found that service must be suspended to lay the sewer which goes down in the center of the street.

Next Step in Los Angeles Terminal Plan

The Interstate Commerce Commission made public recently its decision on the hearing held several months ago at Washington, D. C., concerning the building of a union station at the Plaza site, in Los Angeles, Cal., or any other location. Under the existing laws, the commission said it was not empowered to require the construction of a union passenger station of the character sought by the city of Los Angeles. This decision marks the commission's final action in the case.

In 1916 the Railroad Commission approved and ordered the construction of a terminal on the Plaza site. The railroads contended that the state body did not possess authority to order interstate carriers to provide terminal facilities. The carriers contended that if authority was vested in any governing body, the Interstate Commerce Commission, and not the state authorities, was empowered so to command. Later the case was taken to the United States Supreme Court, which upheld the ruling of the State Supreme Court that the Interstate Commerce Commission should pass upon the unification plan.

The railroads have long insisted that the best interests of the public and the carriers will not be served by a union station at the Plaza due to the fact that Los Angeles is not a connecting or transfer point for passengers. The carriers have expressed themselves as ready and willing to carry out a plan of enlarging the Southern Pacific Station, building a new one on the present Santa Fe Station site, eliminating crossings at grade, and for the Pacific Electric Railway to construct an elevated to serve points north, east, and south.

Under the Schuylkill to West Philadelphia

Mayor Mackey of Philadelphia has ordered the drafting of tentative plans for a four-track tunnel under the Schuylkill River from 22nd and Market Streets westward to 46th Street. The work will be preliminary to the transit development of West Philadelphia, which will be a part of the Pennsylvania Railroad's new station plans.

One or more tunnels under the Schuylkill are regarded as essential parts of the citys high-speed rapid-transit program. One must carry the Locust Street surface-car subway to West Philadelphia, and another is planned as part of the Pennsylvania Railroads terminal improvements. When these plans were first outlined it was intended merely to remove the present elevated structure on Market Street to a position within the lines of the terminal station, but the awkwardness of this expedient soon became manifest and the proposal to carry the line under the river instead of over it, as at present, has commanded general approval.

In Mayor Mackey's instructions to the city engineers to draft plans for this change, the extension of the proposed P. R. T. subway under Market Street as far west as 46th Street is indicated. This goes further than has been contemplated in any previous discussions of the program. As the Philadelphia *Ledger* puts it, the present proposal will add materially to the cost, and naturally raises the query as to how the cost is going to be met. As the change is primarily to benefit the public, it would be unreasonable to look to the P. R. T. to bear all the burden, but as that company would also be the gainer by the change, the *Ledger* regards it as important that all uncertainty on the subject shall be removed before the city is committed too deeply to the undertaking. Its concern on these grounds has found reflection also from other sources.

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Coral Gables Cars Operated by Miami Beach Railway

Operation of the West Flagler Street car line to Coral Gables was started recently by the Miami Beach Railway, Miami, Fla., which now is operating it as part of the Miami system. A 5-cent fare is in effect to the end of the line at Ponce de Leon Boulevard. The service is operated every twenty minutes in both directions. Cars have a special sign reading "West Flagler Street to 36th Avenue." The city of Coral Gables, which owns the railway system in that place, now operates the cars from West 22nd Avenue in Ponce de Leon Boulevard to Coral Way.

Boston Figures Confused by Wrong Use of Terms

A typographical error appeared in the fourth paragraph of the article on the Boston Elevated Railway, Boston, Mass., in the issue of the JOURNAL for Aug. 18, page 276, in which it was stated: "The 'L' averaged about 1,074,000 passengers weekly in 1917," etc. This number is the week-day passengers; that is, passengers per week-day, excluding Saturdays and Sundays. As printed previously the statement seems to give the company this number of passengers per week. Apparently, from the article, the company had more passengers per day on Sundays and holidays than it did on week-days, whereas, of course, the reverse is the case.

High Safety Records in Chicago

New high records in accident prevention were established in 1927 by employees of the Chicago Rapid Transit Company, Chicago, Ill., according to the annual report recently issued by Melvin W. Bridges, safety engineer. Employees of the Loop division led the transportation department, with a safety operation average of 99.51 per cent for the twelve months of last year. During this time there was only one disabling injury and only nine days of lost time due to employee accidents. The metropolitan division employees of the department came second with a score of 97.31 per cent safe and the south side division finished third with a percentage of 97.30.

Other interesting figures in the report show that 358 safety meetings were held among employees during 1927 and that approximately 625 suggestions were received for raising safety standards.

Amalgamated Asks Concessions in New Orleans

Members of the Amalgamated Association have addressed a letter to the members of the Commission Council as well as all of the officials of New Orleans Public Service, Inc., New Orleans, La., asking the Council to use its good offices and the company to accede to their request that division No. 194 be recognized as the only carmen's union in the city with which a working agreement should be made by Public Service.

The letter states that an existing working agreement, reached in Council chamber, on Aug. 12, 1926, forbids any other organization making an agreement over working conditions with the company and charges that several men not members of the rival organization can violate many rules without even being cautioned or reprimanded.

Another working agreement is to be signed between the company and the men in October and under the agreement the union must notify the company 60 days in advance of the termination of the contract what it will ask in any new agreement. It is because of this that the union sent the letter to the Council and officials of the service company.

Not Quite Sinister

IN THE opinion of Senator Walsh, the results already achieved by the Federal Trade Commission in its investigation of the electric light and power industry have "revealed conditions as startling as they are sinister." Activities of the utility companies which the commission, in an *ex parte* proceeding, has been reviewing and the Senator has been finding both startling and sinister, are those of organized "propaganda" against public ownership. It will be conceded, even by the public utility interests themselves, that many of their salaried molders of public opinion were indiscreet to the point of impudence. That is the head and front of their offending, on the record the Trade Commission has made to date.

So far from being sinister or alarming, their doings have appeared only boresome and at times a little grotesque. Everybody is engaged to some degree in some kind of propaganda, Senator Walsh a little more so than most of us.

Utility associations would have done better to carry on their activities more openly and to let the schools alone. The fact remains that their cultivation of public opinion could not possibly have been as secret and underhanded as the management of the inquiry to date seems to imply, or as the Hearst newspapers would have their readers understand. Everyone knows that the great corporations are against public ownership. What the user of their services must ask himself is whether that interest, so far as this broad issue is concerned, is identical with his own and that of millions like him. One who thinks so is not necessarily an alarming or sinister creature.—*Wall Street Journal.*

City Protests St. Louis Fare Ruling

Notice of the appeal of the city of St. Louis, Mo., to the Cole County Circuit Court for review of the ruling of the Missouri Public Service Commission in the St. Louis Public Service Company rate and valuation case was served on the commission at Jefferson City on Aug. 20. Judge Westhues will set the appeal for hearing at the October term of court. The city has attacked the valuation placed on the property, the rate of return allowed on that valuation, the methods used in determining value and the 8-cent fare allowed the railway.

Purging the Park of Undesirables

Emerson W. Baker, president of the Fitchburg & Leominster Street Railway, Fitchburg, Mass., which controls Whalom Park, has warned bus drivers that they will be prosecuted if they bring undesirable passengers into the amusement park. Mr. Baker said:

The railway has been bothered with parties from Boston and vicinity in the past. We do not like to have them and wish they would not come. If the situation persists the registration numbers of the buses or trucks bringing them into the park will be taken and recommendation will be made to the registrar of motor vehicles that the licenses be revoked.

Turns Against Lights Permitted in Baltimore

Cars of the United Railways & Electric Company, Baltimore, Md., have been authorized to make right and left turns against red signal lights just installed on Baltimore Street. Heretofore they have been required to make turns only on the green signal. Under the present arrangement the turns may be made against the red lights at a signal from the policeman in charge of the intersection. The turns will not be permitted at night, however, when the lights are operated automatically and there are no policemen at the crossings.

Strip and Commutation Tickets Advanced at Green Bay

Fares charged on the city and interurban lines, both electric and bus, operated by the Wisconsin Public Service Corporation at Green Bay, Wis., are to be increased under an order by the Railroad Commission. The cash fares are not increased, the commission merely changing the price of strip tickets and commutation books. The cash fare on the city lines is 10 cents. Under the decision of the commission strip tickets, formerly sold at four for 25 cents, will be sold at six for 50 cents. Commutation books of 50 tickets, formerly sold at $2.50, will be sold for $3 in the future. On the interurban and bus lines, zone books of 40 tickets each, formerly sold for $3, will be sold for $4 under this order.

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Foreign News

Tramway Is Indispensable, Says Lord Ashfield

At the general meeting of the London & Suburban Traction Company, London, England, Lord Ashfield said that the actual contribution made by the tramways to the carriage of London's traffic is still so material that no other form of transport could lightly take it up if, for any reason, the tramways were to cease operation. He said:

We must recognize that tramways are an indispensable part of any complete system of transport that can be contemplated in Greater London for many years to come. The crux of our problem is that the people are heedlessly acquiescing in a competition upon the streets which must, unless checked, ultimately prejudice them. It fails to realize the value of the tramways, and that without the tramways, comfort and convenience would be seriously impaired. Each year, however, some favorable omens appear. The year 1927 was one of growth in traffic. The tide turned late in 1926 and has continued to rise steadily since. There was an advance of about 7 per cent during last year, and this still persists in 1928. It may be attributed to the interaction of two causes—the stabilization of the bus services on tramway routes, and the continuous growth of the travel habit in London, which is increasing in all directions. Our major hope, however, must center upon the scheme which the London and Home Counties Traffic Advisory Committee propounded in July of last year for a common fund and a common management to embrace all the local passenger transport-carrying agencies within the London traffic area.

The advisory committee consists of representatives of local authorities, transport undertakings and labor, and its business is to study traffic problems and to advise the Minister of Transport as to the best means of solving them.

Sydney Electrification Progressing

Electrification of the main suburban railway of Sydney, Australia, is proceeding rapidly. It is expected that electric trains will do much to relieve the congestion of traffic during the peak periods. Two stations on the Sydney underground system are now satisfactorily handling traffic that previously required eight platforms at the central station.

Traffic Increases in Lisbon

For the year ended Dec. 31, 1927, the Lisbon Electric Tramways, Ltd., Lisbon, Portugal, carried 104,581,427 passengers compared with 97,422,768 the preceding year. The increase is largely due to the inclusion of the passengers carried on the Ascensores Lines, which were previously worked as a separate enterprise. After deducting interest charges and the payment of £24,540 interest on and the redemption of the debentures a net profit of £161,875 is shown. To this sum is added the credit balance of £8,370 of profit and loss brought forward from last year, which leaves a balance of £170,182. Capital expenditure during the year amounted to £47,384, represented by additional rolling stock and extensions of the system. These facts were disclosed in the report of the directors at the general meeting held in London on June 13, 1928.

Madras Suburbs to Electrify

Proposals of the Railway Board for providing electric traction in the Madras, India, suburban section of the South Indian Railway, have been accepted by the standing finance committee. Electric energy will be supplied by the Madras Electric Supply Corporation at specially low rates. The work of electrification is to commence at once.

The South Indian Railway is now carrying out a project for the improvement of suburban traffic in Madras. With the adoption of electrification it is proposed to modify the work already in progress to meet the requirements of electric service.

Electrification Needed in Egypt

Some time ago the Egyptian Government appointed Sir Philip Dawson, M.P., to investigate and report on the possible electrification of the railway between Cairo and Helouan. The report stated that more than a mile of the Cairo end of this line is an obstacle to city traffic and recommended construction of a subway or elevated line to relieve the congestion. It has now been decided to construct an overhead track from the Bab-el-Louk Station to the outskirts of the city. Eventually this line may be extended to the central portion of Cairo.

New Subway for Barcelona, Spain

By a royal order, Mariano Rubio, a prominent engineer of Barcelona, Spain, has been granted the concession to build and operate a subway between Barcelona and Badalona, the latter an important manufacturing city of 30,000 inhabitants 9 kilometers from Barcelona, and now connected with it by railway, tram line, and autobus service. The construction is to be completed within four years, and will cost, judging from the amount of the bond specified in the contract, about 50,000,000 pesetas (current value of the peseta about $0.17). Mr. Rubio is chief engineer of the Sociedad Anonima El Tibidabo, Barcelona. It is rumored that he has sold the concession to the group of Barcelona capitalists owning the Tranvias de Barcelona, which operates the tram lines of the city and also controls the subways and the autobus services now existing.

Brazil Line Nearing Completion

Electrification of the branch of the Oeste De Minas Railway, Brazil, from Barra Mansa to Augusto Pestana, is nearing completion. This constitutes the first electrified branch of a railroad belonging to the government.

Swiss Federal Railways Enters Gasoline Business

Establishment of gasoline tanks in 200 Swiss Federal Railways stations, from which sales will be made to the public by the station personnel, was recently approved by the board of directors. The foreign company with which the arrangement is to be made, agrees to transport all of the gasoline by rail to the various stations. In return for this agreement the railway is forbidden to accord to any other company, either Swiss or foreign, any similar concession under more favorable terms. It is believed that this business will pay the railways a yearly commission of approximately 1,500,000 francs ($288,600).

Italy Extends Electrified Lines

Another 16,000,000 lire, or about $750,000, will be spent by the Italian State Railroads for the electrification of the Cuneo-San Dalmazzo line to the French frontier, a distance of 64 kilometers, according to a recent report. The building of power houses, transmission lines and distributing plants will be completed by the Societe Generale per Costruzioni of Rome.

Railway to Construct Public Building

Construction of an exhibition building at Earl's Court, London, England, is planned by the London Underground group of electric railways. It is expected that this will be not only the largest and best building of its kind in London, but also one of the finest exhibition structures in the world. The site is that of an old exhibition building. It is twenty acres in extent. The plot adjoins Earl's Court stations of the Metropolitan District Railway and the London Electric Railway. If the plans are carried out it is expected that the building will be completed within the next two years. The Department of Overseas Trade is said to plan to hold the annual British Industries Fair in the building.

Trackless Trolley in Chesterfield

Installation of trackless trolleys was made in Chesterfield, England, some few months ago, superseding the electric tramways. The Town Council also operates petrol buses, the total number of both classes of vehicles now being 72. The trolley buses are single deck, center entrance, with seating accommodations for 32 passengers. The total length is 26 ft., and 60-hp. motors, working at 500 volts, are employed.

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Recent Bus Developments

More Cars Express and Buses Local in Detroit

Express service by street cars was instituted by the Detroit Municipal Railway, Detroit, Mich., on Grand River Avenue on Sunday, Aug. 19, with strong probability that similar service will be installed on both Woodward and West Fort Street. The Grand River Avenue service is operated in the same manner as that on East Jefferson Avenue, except that auxiliary buses are not run all through. Street Railway Commissioner Ellis was quoted as follows:

We have found the auxiliary buses being used on Jefferson Avenue are maintaining runs much too long to prove profitable at a 6-cent fare. So we shall try to find a way to shorten the bus runs on Grand River Avenue.

Following the installation of the service Del A. Smith, general manager, was quoted as follows:

The new Grand River service seems to be universally popular. It is even more of a success than was the introduction of similar service on East Jefferson Avenue. This probably is due to the fact that the Jefferson line, the real pioneer in this field, has done much to educate the public to the idea. There was an increase of between 10 and 15 per cent in the number of passengers carried over the usual Sunday crowd. Many of the passengers expressed delight at the new service.

Mr. Ellis also said:

Inasmuch as the express service we have been operating on East Jefferson Avenue was tried out on one of the most favorable streets in the city, the Grand River Avenue express service, because of the differences between that thoroughfare and East Jefferson Avenue, will be purely in the nature of an experiment. Should the experiment work as nicely as it has on Jefferson, there is every reason to believe we will institute the same sort of service on other principal streets. There are some, of course, such as Gratiot Avenue, where express service is impossible.

By Railway, Bus and Ferry Proposed

Announcement of plans for a ferry line across the Chesapeake Bay from Sandy Point, on the Western Shore, to Stevensville, on Kent Island, Eastern Shore, has aroused interest in both electric railroad and bus transportation circles. If the ferry is established the Washington, Baltimore & Annapolis Electric Railroad will consider extending its service to provide transportation to the western terminus. This the company could do by a bus line connecting its road with the ferry instead of extending the railway. At the same time the Red Star Bus Lines, Inc., may apply to the Maryland Public Service Commission to extend its facilities on the Eastern Shore, operating through Stevensville to the Eastern end of the proposed ferry. Both projects, however, are contingent upon the plans for the ferry being carried out by its backers.

More Buses for St. Joseph

The St. Joseph Railway, Light, Heat & Power Company has applied to the Missouri Public Service Commission for authority to substitute buses for street cars on the Grave Avenue line in St. Joseph. The petition states that the buses can be operated more economically than the cars and at the same time will serve more territory and furnish more adequate service. The commission has the petition under advisement, and will set a date for a public hearing later.

Bus Routes Suggested for Hamilton

A drastic plan to avoid congestion on the West Side, a residential district of Hamilton, Ohio, will be brought before railway officials and the City Council by R. P. Price, City Manager, before a new franchise is drafted. The rails on Main Street would be torn up under the plan and two bus routes substituted, neither of them operating over Main Street, which would be left free to private vehicles. The project is an indication, city officials say, of how bus lines will be emphasized when new routes are laid out to extend service from present railway lines before a new franchise is granted.

Double-Deck Ban Overruled by New Jersey Court

The Supreme Court of Trenton, N. J., set aside as unreasonable an ordinance of the city of Camden prohibiting the operation of double-decked buses not equipped with pneumatic tires on any street south of Federal Street. Protest had been made by the Pennjersey Rapid Transit Company. The court ruled that the number of decks on an autobus did not seem to present a substantial basis for regulations to conserve the highways; that the weight, and not the height, of the vehicle seemed to bear relationship to the preservation and proper maintenance of the streets of the city.

Staten Island Operator Posts Bond

The New York Transit Commission has announced that the Tompkins Bus Corporation, which received a certificate of convenience and necessity to operate twelve routes in Staten Island, has complied with all financial requirements, including the posting of a $250,000 bond to provide indemnity against accidents to passengers. The Richmond Railways, Inc., which protested the application before the commission, has carried its opposition to the courts.

Interurban Buses a Menace in Kansas City

An ordinance is to be introduced soon in the City Council by Councilman Charles H. Clark providing that bus lines operating in and out of Kansas City, Mo., be brought under the regulation of the city and be made to pay some revenue to help in the upkeep of city streets. Mr. Clark pointed out that the bus companies operating in the city were using the streets for traffic and parking purposes free, whereas the railway not only paid revenue to the city but was subject in the routing of its cars to the direction of the City Council. Mr. Clark was firm in his belief that the Council should control bus routings over the city to prevent congestion. He also said the city should have some means of knowing whether the companies operating the buses were responsible. He believes the Council has the right to control buses within city limits.

Southwestern States Seek Interstate Plan

A conference of railroad commissioners, truck directors and bus line operators of seven Southwestern states has been called by the Texas commission for Amarillo, Tex., Sept. 6, to discuss possible means of regulating interstate bus traffic in the absence of federal laws and to initiate a program of federal bus regulations. States to be included in the conference besides Texas are Oklahoma, Arkansas, New Mexico, Colorado, Arizona and Louisiana. Recommendations for bus legislation deemed necessary probably will be drafted and submitted to the congressional representatives of the states interested. A reciprocal agreement may be sought to make it possible for states containing portions of a proposed interstate line to co-operate in the granting or denial of intrastate permits.

Buses in Utica

Hearings were held recently before the Public Service Commission on applications by the New York State Railways for consent to the abandonment of two portions of its route in Utica. The territory covered by these two sections of line are now being served by bus lines of the Utica Co-ordinated Bus Line Company, Inc., a subsidiary of the New York State Railways. There was no opposition to the two abandonment proposals. The city of Utica was said to be favorable to the approval of both applications and desired the tracks removed as soon as possible so that repairing in the streets named might be carried on without delay.

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Financial and Corporate

Sale at Fort Smith

Stockholders to meet Sept. 4 to vote on Standard Gas & Electric offer. Growth of territory slow

STOCKHOLDERS of Fort Smith Light & Traction Company, Fort Smith, Ark., have been notified of a special meeting in Fort Smith on Sept. 4 for the purpose of voting on the question of authorizing the sale and transfer by the company of all its property to the Standard Gas & Electric Company.

This decision follows the conclusion that no appreciable change in operating conditions can be looked for and that the railway department of the company cannot be made to operate on a profitable basis. A very substantial proportion, in excess of 35 per cent, of the investment represented in the company is in its railway properties. Earnings of the railway department have been showing a steady decline and have not been sufficient to take care of adequate maintenance charges and, of course, insufficient therefore to provide any interest on the money invested or set up any depreciation on these properties. The regulated nature of the utility business provides that unless each department is operating profitably, the business as a whole cannot earn money.

In the case of the Fort Smith Light & Traction Company the percentage of the investment in the railway property, as compared to the whole, was so great as to preclude any possibility of profitable operation by the electric and gas departments carrying the business along. The present annual net earnings of the electric and railway properties of the company and its subsidiary are about $250,000 annually, with fixed annual interest charges of more than $290,000, without including any charges for depreciation or full return on public money invested in the Mississippi Valley Power Company.

Stockholders were previously advised that a contract had been entered into by the company, to dispose of its gas properties for a cash consideration directors believe to be reasonable. This sale has been consummated and the proceeds deposited with the trustee as security to the company's first mortgage bond. The company now proposes to dispose of its electric and railway properties and its interest in Mississippi Valley Power Company to Standard Gas & Electric Company for a consideration sufficient, together with the cash which is now on deposit with the trustee, to pay off all of its indebtedness, consisting of $2,850,000 first mortgage bonds, $1,100,000 second mortgage bonds and about $2,000,000 floating debt, and to provide a balance equivalent to $20 a share for the 7 per cent preferred stock at present outstanding.

In line with the demands of the times, the Fort Smith Light & Traction Company carried out a building program of its own, improving the service already being rendered and extending same to points up to that time not being served. Much new trackage was added to the railway to supply transportation it was believed these then growing communities would shortly require.

Contrary to expectations, the history of the territory served by the company has been a most disappointing as well as uncertain one. This has resulted in the company's failure to receive the increased earnings expected and, in certain instances, to lose business due to interests moving from these communities to other places considered more advantageous. An official statement says:

> The decline in general business throughout this territory, along with the advent of the automobile, practically pronounced the doom of the company's railway business. Everything possible has been done to stimulate it, but without success. Concerted efforts to interest new industries to locate in this section have generally failed. In the year 1922, the management acquired territory contiguous to its operations and formed the Mississippi Valley Power Company in an unsuccessful effort to strengthen the Fort Smith situation. Fort Smith Light & Traction Company's credit was not sufficient to finance this territorial acquisition, again requiring further advances by Standard Gas & Electric Company, in addition to the continual demands already existing.

The Fort Smith Light & Traction Company was incorporated under the laws of the State of Arkansas in 1903, and was acquired by H. M. Byllesby & Company interests in September, 1904. At the time of acquisition, the company was furnishing Fort Smith and suburbs with electric light and power, gas and railway service. In January, 1910, the utility serving Van Buren with electric light and gas was purchased and, about that time, other properties were acquired, establishing the company practically as it has existed up to the present date.

Hearings on Consolidated Returns

Sept. 10-15 set as date for consideration of new provisions of revenue act. Railway association prepared to help. Representation at Washington suggested

SO DIFFICULT is the task before it that the Treasury Department has issued a call for the presentation of the views and suggestions by persons familiar with consolidated return problems of the taxpayers beginning Sept. 10, and continuing through Sept. 15, in room 276, of the Treasury Building in Washing ton, D. C. This, of course, indicates that the Treasury Department realizes the difficulties that will arise in the interpretation of the new clauses of the act of 1928 and further that Congress has given it wide latitude in the determination of rules. It is suggested that companies which propose to present consolidated returns keep in touch with these hearing and if necessary be represented there.

The revenue act of 1928 was signed by President Coolidge on May 29. It contains several new provisions of considerable interest to the electric railway industry. One of the most important relates to consolidated returns.

G. G. Brownell of Henry L. Doherty & Company has summarized the new income tax provisions as follows:

> For the year 1928 the provisions of the act of 1926 with respect to consolidated returns have not been changed. For the year 1929 and subsequent years, whether corporations may file consolidated returns will be determined by new rules regarding affiliation. The new law defines an affiliated group as "one or more chains of corporations connected through stock ownership with a common parent corporation if (1) at least 95 per cent of the stock of each of the corporations (except the common parent corporation) is owned directly by one or more of the other corporations; and (2) the common parent corporation owns directly at least 95 per cent of the stock of at least one of the other corporations. The term 'stock' does not include non-voting stock which is limited and preferred as to dividends."
>
> A consolidated return can be made only for domestic corporations within the affiliated group, except in the case of a domestic corporation owning or controlling 100 per cent of the capital stock of a corporation organized under the laws of a contiguous foreign country, and maintained solely for the purpose of conforming to the laws of such country, in which case such corporation may be considered as a domestic corporation. Consolidated returns, however, may not be filed in Class B affiliations (those in which the stock of two or more corporations is owned by the same interests).
>
> Commencing with 1928 the law gives the commissioner the right, in order to prevent the evasion of taxes, to apportion, allocate or distribute the income or deductions between two or more trades or businesses owned or controlled by the same interests. Previously the commissioner could "consolidate the accounts" of related trades or businesses and was required to do so if requested. The new law eliminates this phrase and authorizes the commissioner to make such allocation, but gives the taxpayer no right to demand such action.

The American Electric Railway Association through its economist, Leslie Vickers, is keeping in close touch with the situation and will be glad to send information about the provisions of the act or the course of the hearings in Washington to those interested.

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Revenues Up Only 4½ per Cent in Portland

The results of the recent fare increase on railway lines operated by the Cumberland County Power & Light Company, Portland, Me., as shown by the report for July and by figures compiled for the first two weeks in August, have not been as satisfactory as expected, due to a substantial decrease in the number of passengers carried.

The July report shows an increase in gross passenger revenue of $4,666 over the corresponding month of last year, but this figure represents an increase of only 4½ per cent whereas the ratio on which the fare increase was based was one of approximately 25 per cent. The gross passenger revenue in July, 1928, was $107,211 compared with a gross passenger revenue of $102,544 in July, 1927.

In spite of the increase in passenger revenue, the July report shows a deficit of $7,049. The deficit reported for July, 1927, was $18,008. A comparison of these figures shows an improvement but the decrease in deficit was not due entirely to the fare increase but partly to a decrease of $5,690 in operating expenses in July, 1928, compared with July, 1927.

This decrease in expenses of operation is principally the result of two factors (1) 100 per cent one-man operation and (2), a lower cost of power and the generation of more energy because of a better flow of water in the Saco River.

If the July report indicates no great improvement in the finances of the company, the gross revenue for the first thirteen days in August tells an even more significant story. During this period the increase over the returns of the corresponding period of last year is a matter of less than $200.

To Fred. E. Gordon, general manager, is attributed the explanation that "people aren't riding." He does not believe that the decrease in traffic is due to the fare increase which became effective July 1 or to the new zoning system which was installed at that time. He bases his opinion on the fact that he has received "little or no complaint due to the raising of the rate or to the zone system." He points out that prosperity and automobiles have made a serious inroad on the railway business, since "most people have one car and many have two or more."

The company recently petitioned for the discontinuance of certain lines and when its petition for an increase in rates was granted by the commission the new schedule was adopted as an experiment to maintain all existing lines.

Director Concerned About Trend of Kansas City Earnings

Dr. H. P. Saunders, New Orleans, La., one of the directors of the Kansas City Public Service Company, Kansas City, Mo., appears concerned with the decreases in patronage, continuous now over 35 months. The company's $6,600,000 rehabilitation program is about completed with $5,900,000 expended as of Aug. 1. Earnings still show a substantial surplus above bond interest and preferred stock dividends due in large measure to savings in operating expenses of almost $1,000,000 a year. Meanwhile, however, fixed charges have increased as a result of the new capital brought into the company and the necessity of setting up depreciation funds. The doctor fears the company is near the end of economies while the reports of patronage continue to show decreases. In addition to the railway problem, there is the fact that bus revenue has decreased. It has been suggested that fares be readjusted and that a zone system be instituted. The six-months' trial period under the new system of bus fares, to which reference has already been made, ends on Dec. 1.

Results in Cincinnati Approximate Estimates

Operations of the Cincinnati Street Railway, Cincinnati, Ohio, for July showed a deficit of $13,514. Walter A. Draper, president of the company pointed out on Aug. 16 that this deficit was expected, for the 1928 budget submitted last December indicated a deficit of $13,062, or within $500 of this result. Deficits also were experienced in July and August of 1927 and 1926, it was observed. Mr. Draper also said that "notwithstanding the fact that a deficit can be expected in the midsummer months, the deficit was due also last month to the fact that operating expenses and fixed charges are showing a continued increase on account of the enlarged program of improvement and expansion."

For the first time since the railway began the operation of motor coaches more than two years ago, a small surplus was realized from this source last month, it was stated. Mr. Draper regards this favorable trend in motor coach operation as quite gratifying, since it will help to offset any loss that may result from the coach service to the new Western Hills High School to be started next month.

The number of revenue passengers carried in July was 8,150,523, compared with 8,140,221 in July, 1927, or an increase of 10,302.

STATEMENT OF EARNINGS OF CINCINNATI STREET RAILWAY FOR JULY

Operating revenue	$727,350
Operating expenses	523,470
Net operating revenue	$203,879
Taxes	69,026
Operating income	$134,852
Non-operating income	1,993
Gross income	$136,846
Rental, interest, sinking fund and return on capital	150,361
Deficiency	$13,514
Total in fare control fund June 30, 1928	448,716
Total in fare control fund July 31, 1928	$435,201
Revenue passengers	8,250,523
Transfer passengers	2,771,323
Free passengers	123,129
Total passengers carried	11,144,975

Conspectus of Indexes for August, 1928

Compiled for Publication in ELECTRIC RAILWAY JOURNAL by

ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Last 5 Years High	Last 5 Years Low
Street Railway Fares* 1913 = 4.84	Aug. 1928 **7.65**	July 1928 **7.66**	Aug. 1927 **7.52**	July 1928 **7.64**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	Aug. 1928 **142.5**	July 1928 **141.8**	Aug. 1927 **142.1**	April 1923 **175.3**	Feb. 1928 **139.5**
Electric Railway Wages* 1913 = 100	Aug. 1928 **229.7**	July 1928 **229.2**	Aug. 1927 **227.8**	Aug. 1928 **229.7**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost Elec. Ry.) 1913 = 100	Aug. 1928 **204.5**	July 1928 **203.3**	Aug. 1927 **200.9**	March 1924 **206.8**	Jan. 1923 **187.3**
Eng. News-Record Construction Cost (General) 1913 = 100	Aug. 1928 **207.3**	Julyl 1928 **206.6**	Aug. 1927 **205.5**	March 1924 **224.7**	Nov. 1927 **202.0**
U.S. Bur. Lab. Stat. Wholesale Commodities 1926 = 100	July 1928 **98.3**	June 1928 **97.6**	July 1927 **94.1**	March 1925 **104.8**	April 1927 **93.7**
Bradstreet Wholesale Commodities 1913 = 9.21	Aug. 1928 **13.19**	July 1928 **13.14**	Aug. 1927 **12.58**	Dec. 1925 **14.41**	July 1924 **12.23**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	July 1928 **152.8**	June 1928 **152.6**	July 1927 **153.4**	Nov. 1925 **167.1**	May 1924 **141.0**
Cost of Living Nat. Ind. Conf. Bd. 1914 = 100	July 1928 **161.1**	June 1928 **160.9**	July 1927 **162.2**	Nov. 1925 **171.8**	Feb. 1923 **157.5**
Industrial Activity Elec. World—Kw.-hr. used 1923-25 = 100	July 1928 **120.2**	June 1928 **116.4**	July 1927 **110.6**	Feb. 1928 **127.7**	July 1924 **73.4**
Bank Clearings Outside N. Y. City 1926 = 100	July 1928 **100.7**	June 1928 **104.5**	July 1927 **100.0**	May 1928 **108.4**	Aug. 1923 **81.6**
Business Failures Number	July 1928 1445	June 1928 1615	July 1927 1527	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	**31.11**	**44.73**	**41.83**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

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$110,000 Equipment Issue Under Advisement

Transit Commissioner Godley, after a brief hearing, has taken under advisement the application of the Surface Transportation Company, a Third Avenue Railway subsidiary operating bus routes in the Bronx, New York City, to issue $110,000 in equipment trust notes. The notes are to be for a three-year term. The proceeds realized by their sale are to be used for the purchase of new buses and equipment.

Worcester Net Increased

Although operating revenues decreased, there was a noticeable increase in net income for the first half of 1928 over 1927, according to the semi-annual report of the Worcester Consolidated Street Railway, Worcester, Mass., filed with the Department of Public Utilities. Operating revenues for the first six months to June 30, 1928, were $1,641,266 and for 1927 $1,685,505; operating expenses, 1928, $1,278,586; 1927, $1,380,339; operating income, 1928, $308,086; 1927, $252,372; gross income, 1928, $311,634; 1927, $256,547; interest, etc., 1928, $231,634; 1927, $183,074; net income, 1928, $80,347; 1927, $73,463.

Wisconsin Interurban to Suspend

The Wisconsin Public Service Corporation has been authorized to discontinue the 23-mile interurban line connecting Green Bay and Kaukauna. The abandonment was opposed by representatives of Wrightstown and the county sanatorium, but the commission declared that it was outside its power to require service to be continued since an order of that kind would deprive the company of its property without due process of law.

The City Council of Green Bay had previously agreed with the company for the substitution of bus service on the South Broadway line, namely, the portion of the Kaukauna line within the limits of Green Bay, should the commission permit the Kaukauna line to be discontinued. Under this agreement the tracks used by the Kaukauna and South Broadway cars will be removed from the streets, including those over one of the city's bridges. The company does not plan to substitute buses for the interurban, but trippers may be operated mornings and evenings between West DePere and Green Bay, a distance of 5 miles.

Short Abandonments Sought by Pacific Electric

The Pacific Electric Railway, Los Angeles, Cal., has applied to the Railroad Commission for permission to abandon passenger service on its line from Venice to Inglewood, in Los Angeles County. It is also seeking permission to abandon passenger service on its main line between Huntington Beach and La Bolsa, maintained for the purpose of serving the factory of the Holly Sugar Company at La Bolsa, abandoned as a sugar plant a number of years ago.

Butte Railway Sold With Clark Holdings

Mineral, timber and banking properties of the late Senator W. A. Clark have been sold to the Anaconda Copper Mining Company for a consideration between $6,000,000 and $9,000,000. Included among the properties conveyed to new owners is the Butte Electric Railway.

New Ruling on Expenditures of Less Than $100

Expenditures by electric railways for additions and betterments under $100 must be charged to operating expenses under a revision of the Interstate Commerce Commission accounting rules for electric railways. Revision applies mostly to minor items of road and equipment expenses. The order, dated July 21, 1928, follows:

It is ordered, That the following instructions are hereby prescribed as the fourth paragraph of section 1 of the general instructions on page 91 of the Uniform System of Accounts for Electric Railways, issue of 1914:

(a) When the property change involves: (1) the acquisition of property (other than land, a section of track, or a unit of equipment) the cost of which is less than $100; (2) the betterment of property (see paragraph 2 of section 2 of the general instructions on page 91 of the Uniform System of Accounts for Electric Railways) the excess cost of which is less than $100; or (3) the retirement of property (other than land, a section of track, or a unit of equipment) the ledger value of which is less than $100, the cost of the property acquired or the value of the salvage from the property retired shall be appropriately included in operating expenses, and no adjustment shall be made in the property investment account.

(b) The carrier shall not parcel expenditures or retirements under a general plan for the purpose of bringing the accounting therefor within this rule, neither shall it combine unrelated items of property for the purpose of excluding the accounting therefor from the rule.

(c) This exception to the general instructions of this classification shall not apply to property changes involving the retirement and replacement of property when either the ledger value of the property retired or the cost of the property acquired is $100 or more. The accounting for such changes shall be in accordance with section 4 of these instructions on page 92.

(d) The carrier is permitted to adopt for the purpose of its accounting a limit of less than the aforesaid amounts provided it first files with the commission the maximum amount which it proposes to adopt and makes no subsequent change in this amount except by authority of the commission.

It is further ordered, That the last sentence in the first paragraph of section 4 of the general instructions on page 92 of the Uniform System of Accounts for Electric Railways, issue of 1914, be rescinded.

It is further ordered, That these orders shall be effective on Jan. 1, 1928.

Net Holds Up in Baltimore

Revenue passenger figures of the United Railways & Electric Company, Baltimore, Md., continue to reflect the increased use of the automobile. In July they declined 8.70 per cent. The service to the public, however, continued to be well maintained, with a decrease of only 1.46 per cent in car-miles and a little more than one-half of 1 per cent in seat-miles. Passenger revenue for July increased $15,662, or 1.25 per cent over the similar month last year. Despite heavy increases in wages, power costs and general operating expenses, continued careful and economical operation made it possible to record net income of $1,863, a sum only 5.12 per cent less than the amount for July, 1927.

EARNINGS OF UNITED RAILWAYS & ELECTRIC COMPANY, BALTIMORE

	July, 1928	Increase
Passenger revenue	$1,266,130	$15,662
Other revenue	21,099	†2,736
Total	$1,287,229	$12,924
Operating expenses:		
Way and structures	$73,448	†$3,039
Equipment	75,637	2,253
Power	112,725	4,260
Conducting transportation	433,771	6,872
Traffic	*28,992	1,986
General and miscellaneous	128,738	7,959
Trans. for inv.—Credit	*631	1,021
	$794,692	$21,310
Depreciation	64,361	646
Total	$859,053	$21,956
Net operating revenue	$428,175	†$9,031
Taxes	124,087	†2,890
Operating income	$304,088	†$6,141
Non-operating income	11,803	†2,942
Gross income	$315,891	†$9,803
Fixed charges	234,718	†7,220
Remainder	$81,173	†$1,863
Interest on income bonds	46,666	.....
Net income	$34,507	†$1,863

*Credit. †Decrease.

The net income by months during this year is as follows:

	1928	Decrease
January	$18,368	$53,761
February	18,769	8,820
March	63,255	18,254
April	37,535	23,465
May	61,738	1,791
June	30,000	11,711
July	34,506	1,866
Totals	$264,181	$119,669

Suburban Holdings at Memphis Sold

Lake View, Miss., well-known summer resort and bathing pool, has been sold to R. T. Richardson, by the Memphis & Lake View Traction Company, subsidiary of the Memphis Street Railway. The property will immediately be developed into a pleasure resort by its new owner.

Last May the railway abandoned operation of the 11-mile line built to the resort in 1911 when Lake View appeared to give promise of developing into an important residential locality. The proposed liquidation of the road was reviewed in the JOURNAL for July 7, page 33.

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Personal Items

New Head of Brazilian Company Knows Property

Miller Lash, K.C., who has succeeded Sir Alexander Mackenzie as president of the Brazilian Traction, Light & Power Company, and the subsidiary enterprises in Brazil, has for many years been associated with the company's undertaking both as a director and also as the principal executive vice-president of the company in charge of its head office. Mr. Lash will continue to make regular visits to Brazil in order to keep in close touch with the operation of the business.

H. H. Couzens, who is resident in Brazil, will continue as executive vice-president, and will have full charge of and authority over the operations and staff in Brazil, and A. W. K. Billings, also a vice-president resident in Brazil, will as heretofore, continue in control of the hydraulic construction and concessions.

Sir Alexander found it necessary to resign because of ill health, but it is stated the company will continue to have the benefit of his advice and experience. He assumed the presidency of the company in 1915 and has been associated with the undertaking for nearly 30 years, during which the growth of the business under his able and far-seeing administration has been remarkable.

F. B. McCurdy Succeeds W. B. Ross at Trinidad

At a meeting of the directors of the Trinidad Electric Company, Trinidad, British West Indies, held recently in Halifax, Nova Scotia, F. B. McCurdy, P.C., was elected president of the company to succeed W. B. Ross, K. C. J. H. Winfield and W. H. Couvert, were elected to the board to succeed F. W. Teale and W. B. Ross.

E. B. Meissner Heads Airport Bond Committee

Edwin B. Meissner, president of the St. Louis Car Company, was general chairman of the St. Louis Municipal Airport bond issue committee which recently directed the campaign on behalf of the proposed $2,000,000 bond issue for an airport voted upon by residents of St. Louis.

August Menger With Electric Company

August Menger recently resigned as assistant treasurer of the San Antonio Public Service Company, San Antonio, Tex. He joined that company in 1906 as a stenographer to W. B. Tuttle, now president. While working at stenography he studied electrical engineering at night. Completing this course, he left the company to go with the Denver Gas & Electric Company. After serving the company at Denver several years he returned to the San Antonio Company and worked in the operating end of the business, later becoming assistant treasurer. It is understood Mr. Menger will become actively associated with the Crowther Electric Company.

John A. Seymour Made Auditor of Chicago Rapid Transit

John A. Seymour, assistant auditor of the Chicago Rapid Transit Company, Chicago, Ill., has been appointed auditor, succeeding the late T. B. MacRae.

Mr. Seymour's first employment was with the Chicago, Racine & Milwaukee boat line and the Northern Michigan Transportation Company, holding the position of auditor with both companies until 1917. He worked with the Federal Electric Company as a special accountant for one year when he went to the North Shore Line as assistant auditor in 1918. In 1922 he was appointed assistant auditor of the Rapid Transit Company and acted in that capacity until his promotion to the position of auditor.

J. A. Seymour

Mr. Seymour was born in Manistee, Mich., in 1889. He was educated in the grade and high schools of that city, at St. John's Military Academy, Delafield, Wis., and the Ferris Institute, Big Rapids, Mich.

Obituary

Col. George B. Harvey

So multifarious were the activities of Col. George B. Harvey, who died on Aug. 20, that sight is likely to be lost of the business activities of this stormy petrel with his tripartite career—political, diplomatic, and journalistic. Had he chose to do so, there is no doubt that Colonel Harvey could have made business his forte, but whatever of romance there might be in business, it was not the type of activity that made a lasting appeal to him. What did not appeal to Colonel Harvey he did not do.

One of the first men correctly to appraise the talents of the colonel was the late William C. Whitney, financier and transit owner, with whom the colonel served as assistant in the days of the Metropolitan Street Railway in New York City. This was as long ago as 1893. But even then the colonel had manifested the proclivity which made it almost necessary that he work alone. That is what he did. Colonel Harvey had a share in the construction of the electric railway on Staten Island and the Atlantic Coast Electric Railway at Long Branch and Asbury Park, N. J. He became an official of the Staten Island Ferry Company, the General American Reduction Company, and vice-president of the National Salt Company. He extended his railroad interests to the electric railway in Havana. Moreover, he reorganized a vast publishing business, and probably saved from extinction a name honored wherever the mechanics of literary production are appreciated.

On Colonel Harvey's advocacy of the candidacy of President Wilson, and on his breach with the President, the daily newspapers have dwelt at length. Caring nothing about political office himself, the colonel almost may be said to have made and unmade candidates. In this process he gave vent to talents that were almost impish, yet so forceful and at times so profound were his delineations that his piquancy did its work without the personal destruction that is so deadly in the case of so many outstanding commentators on men and events. In other words, the colonel could differ honestly with others, and still do so in a way that did not destroy the commentator at the same time that it flattened his victim. That, of course, is art. And Colonel Harvey was an artist. There can be no gainsaying that. One of the most penetrating quips Will Rogers ever uttered was made on the occasion of the colonel's return from the Court of St. James, when Rogers said that he had gone down to the dock to hear the colonel land.

It has been said that the Irish immigrant has lent to the United States just the leaven needed to make life here tolerable. It can just as truly be said that the few commentators of the Harvey type it has been the good fortune of the United States to possess, have kept its journalism from becoming prosaic. There has been no successor to Colonel Watterson in journalism in the United States and there is little present evidence that a successor is likely soon to arise who will dim the recollection of this man who "made things interesting because he was himself keenly interested." Colonel Harvey kept people amused and excited. In doing so, seldom did he offend. That is indeed a great achievement.

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Construction Work Livens Market

Shop and garage structures proposed for Oklahoma City and Baltimore. Car purchases planned by several railways in this country and Canada

RECONSTRUCTION by the Seattle Municipal Street Railway, Seattle, Wash., of its tracks on Third Avenue at an estimated cost of $90,000 is provided for in an ordinance passed by the City Council, according to reports received this week. This reconstruction work will be carried on in connection with the repaving of Third Avenue and the widening of the roadway by reducing the width of the sidewalk on each side. The Seattle Utilities Committee has requested the railway department to furnish a full report on the cost of a new and permanent elevated fill from the West Waterway to First Avenue South. The Community Traction Company, Toledo, Ohio, has let contracts for track renewals in Monroe Street, Central and Stickney Avenues, the repaving of which is now in progress.

The Worcester Consolidated Street Railway, Worcester, Mass., has completed the reconstruction of 1,415 ft. of double track on James Street, requiring 87 tons of rail. Other equipment required on this job was 2,830 tie plates, 20 kegs of spikes, 95 thermit joints, 475 tie rods, and 1,415 ties. The expense of this work was about $14,000. The Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., has completed construction of a single-track extension of the Waukegan City street car line, approximately 2,650 ft. long. Steel ties, 100-lb. rail, and welded joints were used throughout. The entire extension is laid in concrete requiring 3,550 sq.yd. of paving.

Levis Tramways Company, Levis, Quebec, proposes to renew about a quarter of a mile of track and is now rebuilding 1 mile of trackwork. Montreal Southern Counties Railway, St. Lambert, Quebec, is building 600 ft. of passing track and is rebuilding and paving with granite blocks its track on Common Street, Montreal. The New Brunswick Power Company, St. John, New Brunswick, is relaying approximately 1,500 ft. of double track with 82-lb. rail on stone ballast foundation, and approximately 1,000 ft. of single track on wooden ties with stone ballast.

Omaha & Council Bluffs Street Railway, Omaha, Neb., is relaying tracks and paving between rails on Leavenworth Street at a cost of $51,400. The Reading Transit Company, Reading, Pa., has installed a new crossover at Fourth and Penn Streets and is now reconstructing track on Fairview Street, in Mount Penn. Los Angeles Railway, Los Angeles, Cal., is renewing special work on Tenth and Main Streets, is constructing curbs and landings on Vermont Avenue and is retieing, ballasting and paving track on East Ninth Street.

The United Railways & Electric Company, Baltimore, Md., is having plans prepared for a structure to be used for storage and maintenance of all the motor buses operated by the company. It is estimated that the structure will cost more than $250,000. The building will have a frontage of about 200 ft. and a depth of about 400 ft., and will be a one and two-story building equipped with the latest machinery. It is expected that bids for this building will be received in the fall.

A new repair shop to cost approximately $100,000 will be built on Noble Street, Oklahoma City, Okla., according to plans being made by the Oklahoma Railway. The Oshawa Railway, Gananoque, Ontario, has been receiving tenders for the erection of a carhouse, store and station building in North Oshawa, Ontario. London & Port Stanley Railway, London, Ontario, is proposing to increase the coal handling plant at Port Stanley from 100,000 tons to a capacity of 300,000 tons with additional sidings and other facilities to cost $193,000. The New York Central Railway, New York, N. Y., has recently awarded a contract for the installation of a rotary converter and transformer in substation 1A, 43d Street, New York City.

The Illinois Traction System, Springfield, Ill., is inquiring for from 100 to 200 composite gondola cars, of 50 tons capacity. The Midland Utilities Company, main office Chicago, controlling the Chicago, South Shore & South Bend Railway, has ordered two 30-ft. steel underframed caboose cars from the American Car & Foundry Company. Calgary Municipal Railway, Calgary, Alberta, is expected to order two one-man cars and will probably be in the market next spring for several more cars. Hydro-Electric Railways, Toronto, Ontario, it is said, expects to be in the market shortly for five-passenger motor cars, one observation trailer car, one electric locomotive, and one motor express car. Detroit Department of Street Railways, Detroit, Mich., has ordered 26 A.C.F. 40-passenger Metropolitan coaches. Eastern Massachusetts Street Railway, Boston, Mass., has ordered five 29-passenger A.C.F. de luxe urban coaches.

Municipal Terminal Proposed for San Francisco

A union terminal for the use of all railroads, electric railways and motor stages to be erected, owned and operated by the city of San Francisco, Cal., has been proposed by Supervisor Milo F. Kent. He has presented a resolution to the Board of Supervisors calling for a survey of the situation by a group of leading citizens authorized to confer with the transportation officials. The resolution was as follows:

Resolved, That the public interest and necessity demand the establishment of a municipal union depot for the terminal of all rail and bus lines carrying passengers in and out of San Francisco, to be centrally located, where electric and steam trains, and buses will have modern and adequate facilities for embarking and disembarking passengers in safe and rapid mannner, and

Further resolved, that to consummate this revenue producing project of a municipally owned union depot for the welfare of our citizens that the Public Utilities Committee call in consultation a group of citizens properly to survey the situation, confer with railroad, bus and transportation officials and report back to this board their recommendations.

New Cars and Carhouse for Tacoma Municipal Line

Ira S. Davisson, Public Utilities Commissioner, of Tacoma, Wash., will immediately seek authorization by the City Council of a $140,000 utility bond issue for the municipal railway belt line, with the direction that the sinking fund board proceed with the sale of the issue. This amount, he stated, will be requested to provide funds to erect a new carhouse, buy new rolling stock and extend the railway to new industries on the Hylebos waterway. The carhouse and rolling stock were destroyed by fire in June. Since then the city has been renting equipment at a charge of $900 a month.

Business Conditions Expected to Improve

Business during the remaining months of 1928 will probably be better than it was during the corresponding months of 1927. So far this year the key industries of iron and steel, building construction, and automobile production have made an impressively good showing, and there seems to be good prospects that they will do well during the remaining months. Car loadings on the railroads and coal production are now beginning week by week to produce records that are a little better than those of the corresponding weeks a year ago according to the Cleveland Trust Company.

Electrical World data on electrical energy consumption indicate that the rate of general production during July, corrected for seasonal variation was the highest ever attained. The present rate of general production is materially above the average summer period of previous years. Automobile

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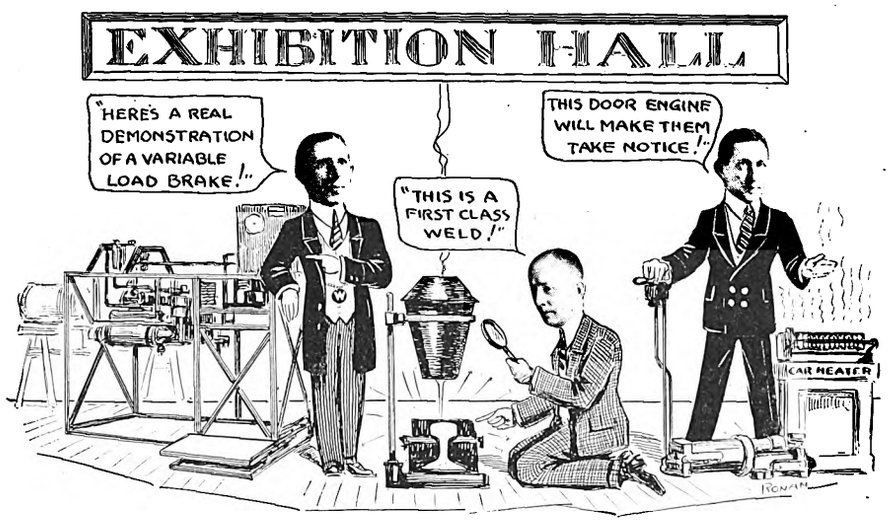
Exhibitograph No. 18



If you have anything to brag about, the Cleveland Convention and Exhibit is the proper time and place

manufacturing plants, including parts, are operating 40 per cent above last year and the metal working plants are operating 21 per cent over last year.

The optimist now has distinctly the better of the argument, according to the National City Bank, as to whether 1928 is to show improvement over 1927. The last quarter of 1927 showed a let-down of activity which caused misgivings about the new year, but the first quarter of 1928 showed recovery, the second quarter gave increased confidence, and the beginning of the third quarter has established a general belief that the year's record will surpass that of 1927.

Commerce Yearbook Shows U. S. Prosperity

"The business of the United States in 1927 was on a very high level, continuing the prosperity which has been characteristic of every year since 1921 and which reflects the steadily increasing efficiency of both industry and trade," the U. S. Department of Commerce yearbook, reviewing 1927, says. "Some recession in activity toward the end of the year has been recovered in the early months of 1928.

"Manufacturing output, the best measure of general economic activity, was less by only an insignificant margin than the record attained in 1926. The somewhat more marked decline in railroad traffic was chiefly due to the abnormally large shipments of coal in 1926, the traffic in 1927 exceeding that of any other previous year.

"In quantitative volume export trade was considerably larger than in any other post-war year, owing primarily to the continued growth of exports of manufactured goods, but the decided decline in average export prices, especially of certain raw staples, left the value somewhat below that of 1925, the peak figure of recent years. Wholesale prices continued to decline during the first part of 1927 and the average for the year as a whole reached about the same low level as in 1921.

"Manufacturing production in 1927 was 44 per cent larger than in 1921. Owing to a slackening in the second half, total output was about 2 per cent less in quantitative volume than in 1926. Mineral production exceeded the figure for 1921 by 47 per cent. Petroleum output showed an unusually large increase as a result of the record-breaking production in the new Seminole field.

"Building construction was again extremely active. Total of construction contracts was substantially the same as in 1926, and more than 50 per cent larger than in 1923. Building construction throughout recent years has been a very important factor in maintaining strong demand for numerous classes of manufactured products. Total value of construction contracts awarded in 36 states in 1927 was $6,084,000,000, only 1 per cent less than the record figure of 1926.

"Factory employment declined during 1927 and averaged lower than in any of the four preceding years. The increasing efficiency of production has made possible an expansion of output with a curtailment of the quantity of labor. Most, if not all, of those leaving factory industries have been absorbed in other occupations."

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

Metals—New York	Aug. 21, 1928
Copper, electrolytic, cents per lb	14.525
Copper wire, cents per lb	16.625
Lead, cents per lb	6.20
Zinc, cents per lb	6.60
Tin, Straits, cents per lb	48.
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.15
Somerset mine run, f.o.b. mines, net tons	1.825
Pittsburgh mine run, Pittsburgh, net tons	1.75
Franklin, Ill., screenings, Chicago, net tons	1.50
Central, Ill., screenings, Chicago, net tons	1.475
Kansas screenings, Kansas City, net tons	2.175
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.3
Weatherproof wire base, N. Y., cents per lb	17.125
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb	10.1
White lead in oil (100-lb. keg), N. Y., cents per lb	13.25
Turpentine (bbl. lots), N. Y., per gal	$0.58

St. Louis Car Organizes Aircraft Company

The Cardinal Aircraft Company has been organized as a subsidiary of the St. Louis Car Company to manufacture airplanes and similar aircraft. The St. Louis Car Company constructed 450 planes for the United States Government during the World War and the present facilities of the car company will be used in the manufacture of aircraft.

The incorporators of the new company are E. B. Meissner, N. L. Rehnquist, and Sears Lehmann, counsel for the St. Louis Car Company.

It is planned to turn out a popular priced plane to sell for about $3,000. Two or three other models will also be developed. The first models will carry two passengers, but it is probable a ten-passenger plane will be among the products of the plant. Production will start in the near future.

Propose Standardization of Mechanical Equipment

Initiation of four new standardization projects for mechanical equipment under the auspices of the American Engineering Standards Committee has been requested by the American Society of Mechanical Engineers. These projects, which are now being considered, are standardization of stock sizes, shapes and lengths for iron and steel bars including flats, squares, rounds and other shapes, particularly in reference to the dimensions and tolerances of hot and cold finished bars, standardization of splined shafts and splines, standardization of rolled threads for screw shells of electric sockets and lamp bases, and standardization of dimensions of stud bolts, including thread dimensions and working tolerances.

TRADE NOTES

OXWELD ACETYLENE COMPANY, New York, N. Y., has issued a new publication describing the uses of the Carbic portable generators.

AMERICAN STROMBOS COMPANY, Philadelphia, Pa., has recently dissolved and its entire business has been taken over by J. Thomas Rhamstine, Detroit, Mich., who will continue to manufacture the same model horns made by the American Strombos Company.

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Richmond, Virginia, Car
Equipped with
Brill 177-E Trucks

Brill Trucks Operate 100,000 Miles With No Maintenance Expense

The Virginia Electric & Power Company of Richmond, Virginia, have fifteen Brill Cars equipped with Brill 177-E Trucks which have been in uninterrupted service for about two years. These trucks have operated over 100,000 miles without necessitating any expenditure for maintenance. They all retain the original rolled steel wheels, the flanges of which are in excellent condition. This is but another illustration where Brill Trucks have given most satisfactory and economical service.

For smooth and comfortable riding action, reduced noise of operation and low maintenance the Brill 177-E Truck is unequaled. It is built "in square" and on the square. These facts coupled with its general operating efficiency are responsible for its popularity wherever installed.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO — WASON MANF'G CO. SPRINGFIELD, MASS.

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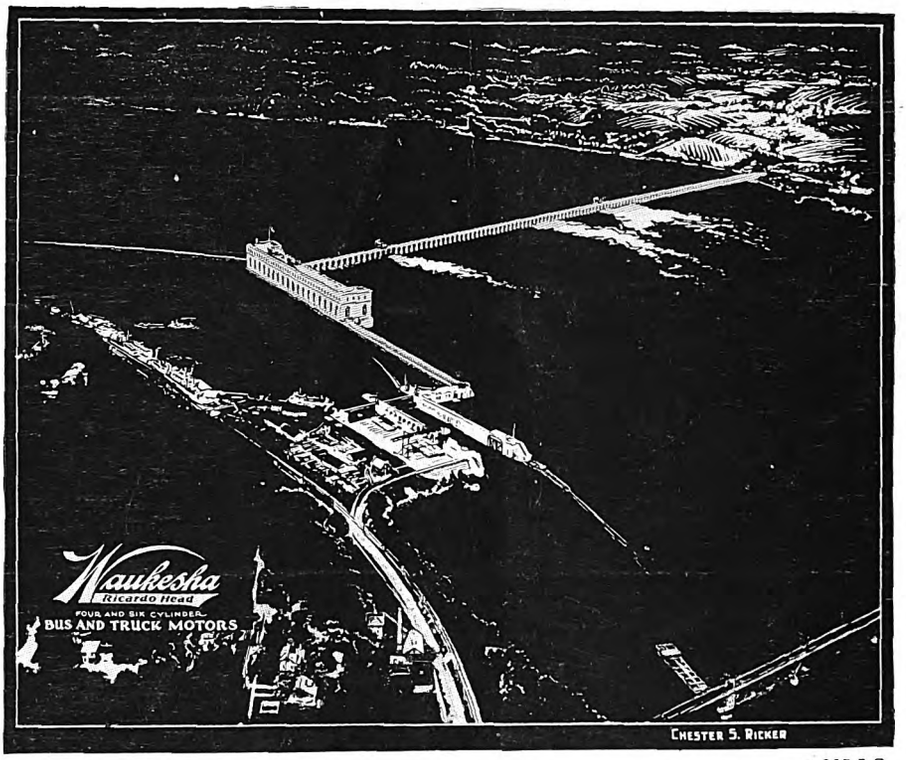

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Famous Keokuk Dam and Power Plant on the Mississippi River

What is a Million?

What is a million horsepower? A million horsepower would require the building of six of these tremendous hydro electric power plants. A million horsepower would meet every electrical requirement of a community of over three million people. And yet a million horsepower is not enough to balance the past year's tremendous output of Waukesha Heavy Duty Engines.

Public utilities must furnish 24-hour a-day service—their plants run continuously. Waukesha "Ricardo Head" Engines are designed for the same kind of service. Their ratings are based on continuous operation at moderate R. P. M. Based on these conservative ratings, new Waukesha Engines aggregating 1,275,582 horsepower, went on active duty during the twelve months ending May 30, 1928. What power do you use?

(A-853-LC)

AUTOMOTIVE EQUIPMENT DIVISION

WAUKESHA MOTOR COMPANY

Waukesha *Eastern Sales Offices* *Eight W. 40th Street* **Wisconsin** *New York City*

Exclusive Builders of Heavy Duty Automotive Type Engines for Over Twenty Years

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ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. SEPTEMBER 1, 1928 Twenty Cents Per Copy

TRADITION

HAS BEEN SWEPT ASIDE BY THE NEW AUTOMOTIVE TYPE STREET CAR ▾▾▾▾

SEE IT AT THE A·E·R·A CONVENTION ▾

(Advertisement)

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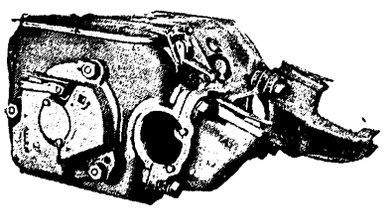
New Street Cars for Detroit's Industrial Growth

WITH the revival of activity anticipated last year at one of Detroit's largest automobile plants, the Department of Street Railways immediately ordered 125 new street cars to assure ample service for the increase in traffic.

This commendable action exemplifies the prevailing civic spirit that makes Detroit "a city where life is worth living".

That most of the new cars, recently placed in service, are equipped with Westinghouse type 510 motors and control, signifies their dependability and low cost of operation.



Detroit joins the many other users of more than 6800 Westinghouse type 510 motors in 23 states and 6 foreign countries where this motor has displayed its exceptional ability to withstand the grind of exacting city service because of its reliable operation, high quality performance and low cost upkeep.

Westinghouse Electric & Manufacturing Company
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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of Street Railway Journal and Electric Railway Review

CHARLES GORDON, *Editor*

LOUIS F. STOLL, *General Manager*

Volume 72 New York, Saturday, September 1, 1928 *Number 9*

The Sword Falls

NO ONE recognizes better than does the railway executive the stark danger that is potentially present in every fast-moving train. He lives under the sword constantly. Safety, safety, safety! Day and night the need for carefulness is drilled into every man on a railway property. The new recruit gets it on his first day and grows gray in the service with the word constantly in his ears. Safety is the first consideration in the selection of every piece of railway equipment. It dictates every operating rule and practice. It colors every thought and action, day after day, month after month and year after year. Yet at an unexpected moment; in the performance of routine duties by the same men who have performed them thousands of times before, something goes wrong. A single mind relaxes vigilance for a moment; a piece of equipment, carefully inspected and tested, fails to function properly; a safety device becomes inoperative. Years of training, precaution and care become impotent in a single instant. And in that instant death stalks forth to take its relentless toll of innocent lives and to leave on the railway executive's shoulders a heavy cross of sorrow, increased worry, and baffled ideals.

Sympathy and understanding go out today from every electric railway man in the civilized world to those who mourn their loss and to the Interborough Rapid Transit Company. Its operation has been a marvel of the industry. Human ingenuity was exhausted in making it one of the best protected railroads in the world. Mechanical and operating skill of a high order had developed an efficiency that elicited the admiration of engineers both in this country and abroad. But human ingenuity failed to protect it from one of those terrifying disasters that make transportation men grow old before their years.

Once more man's own creations have broken their leash and become engines of destruction. Underground in the labyrinth of subways through which New York's millions have been shuttled back and forth for many years, a switch guarded by many protective devices to prevent just such an occurrence, changed position under a moving train. Just how or why has not yet been decided. But in an instant, a steel car with one truck on one rail and the second on another, was completely cut in two by being hurled sideways against the end of a partition wall. The accident occurred at the height of the rush hour, at one of the busiest points on the system, just below the Times Square station. That the toll in death and injuries was not even greater seems almost miraculous.

Several separate investigations are under way to determine the cause of the accident. But will they go beyond this immediate tragedy and examine deeper into the factors that are allied to it? How far can mechanical facilities and human ingenuity be taxed without breaking under the strain? Even to the casual observer it is evident that New York has been exceeding the limit of endurance for years. The Interborough has made an extraordinary record for carrying millions of passengers safely between their work and homes. It has accomplished this despite the fact that it has been hamstrung by politicians, starved by a 5-cent fare fetish, hounded by ambitious labor agitators and ignored by an unthinking public.

Back in December, 1926, Frank Hedley, president and general manager of the Interborough, speaking before the American Institute of Electrical Engineers, called attention to the fact that the subway had originally been built with an estimated capacity of 300,000 passengers a day and an estimated maximum capacity of 500,000 per day. Only a short time after the lines were opened they were carrying 1,000,000 passengers a day, and by 1926 this had reached 2,500,000 passengers. While the costs of labor and material mounted steadily, the fare remained the same. While the loads doubled and trebled and then went to five times what the engineers had estimated as the ultimate capacity, the need for higher speed, longer trains and closer headway became imperative. Every possible safety device was incorporated to provide adequate protection. But despite everything that the company found itself able to do under the limitations imposed upon it, the system is so badly overloaded that even common decency is defiled, and safety of the weak or feeble is endangered. In the light of these facts the record of the company is little short of amazing. Something was bound to snap under the strain. The blame, if blame there is, lies on the heads of those false prophets who have hoodwinked and misguided New York's millions by a policy of procrastination and bickering that imposed intolerable operating conditions.

How long will these conditions be permitted to continue? When will the public rise up and demand a reckoning? Certainly not before the leaders of the city's business and social life recognize their responsibility for the creation of an enlightened public opinion regarding transportation, that will sweep away dog-in-the-manger politics and substitute for it a conscious regard for the public's real interest.

Refusal to Accept Economic Change Blocks Progress

NEW means for efficiency are reflected in the recent achievements at Buffalo, Lockport and other Niagara frontier towns, and in Kansas City, in changing over to one-man operation without the discharge of a single employee. It is not with the vehicle itself that concern rests at this time, but rather with the one-man car as a means to the end of preventing disintegration of service. Full adoption of the one-man car in these cities

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was the one way out for them, if anything like the complement of lines formerly in service was to be maintained intact.

Organizations must adapt themselves to the inventions of an ever-changing society if they are to survive, and survival is not promoted by retrogression or artificial attempts to preserve a decrepit order of things. This is a doctrine that the employees generally have come to indorse no less heartily than have the employers, by their acceptance of the one-man car. It is the doctrine under which there is complete one-man operation not only in the cities mentioned, since they are among the latest to achieve that end, but on many other important properties, such as the Public Service system in New Jersey, the Eastern Massachusetts and many others.

In sharp contrast with the action of the trainmen on these properties and even in the face of the acceptance of the one-man car on the part of the Amalgamated, the car men's local in Des Moines still insists upon compliance with the letter of its contract with the Des Moines City Railway that there shall be two men on the Des Moines cars until the contract expires in 1940. There the union spokesman even threatens to demand enforcement of this absurd provision on the part of the successor company after sale of the present property under foreclosure. That this very insistence has been a material factor in the present financial plight of the company apparently counts not at all. There is, of course, good reason to believe that the courts would not inflict upon the successor company compliance with the terms of a contract that has proved so onerous in the past and so detrimental to others with a stake in the company no less material than that of the employees. This, however, is a judicial point still to be decided in the event that the employees are so foolish as to raise it.

It does seem, however, in the light of the history of the introduction of the one-man car and of its exclusive use by so many systems, that the responsible union operating officials at Des Moines have been much less astute in refusing to bow to the inevitable than were their fellows elsewhere. Already they have sacrificed more than they have gained. Their inflexibility in this respect has destroyed whatever respect was previously felt for them, since they have been placed in strange contrast to their fellows by their unbending attitude.

The world has advanced only because men have capitalized changes they first supposed were their undoing, not through blind devotion to those who resisted these changes. The success that has attended the use of the one-man car demonstrates the acceptance of their obligations by the companies. These obligations the employees must also share, if employee and employer alike are not to perish economically.

Developing Latent Possibilities Through Competition

FROM time immemorial competition has been looked on as one of the most effective means of spurring the human race on toward higher and better things. The Olympic Games are one of the outstanding examples of how the ancients strove to develop a higher type of physical manhood. Not only those who won the prizes, but all who entered the contest, got the benefit of the training and exercise involved. It is noteworthy that much of the advantage came from the wide appeal made to the populace.

There are those who are inclined to scoff at the value of competitions in the industry. But let them enter, let them get the spirit of the thing, and see what a difference. A prominent official remarked some time ago that he could not see the advantage of entering his company in a contest. After considerable urging, however, he decided to do it. The rank and file of the employees took it up, and the enthusiasm, small at first, grew as the contest continued. Imagine the surprise of this official when his company romped off with the principal prize! He afterward confessed that he had entirely misjudged the effect on the company and its employees, the effect on the public, and the effect on himself. He is now firmly convinced of the value of this competition.

A contest that has perhaps not received the attention it merits is the Anthony N. Brady safety medal award. When it was revived last year the number of contestants was not large. Yet those that went in have been repaid in great measure for the work they did. To enter the competition their accident records naturally must have been good. But the opportunity for publicity by enlisting the citizens of the town in behalf of a better accident record is too great to be passed by lightly. In several cities the public generally have done everything in their power to prevent street car accidents. Win or lose, there always is the chance to pit the men against themselves, to do this year what could not be accomplished last. And when the public feels that it has a part in making the record better and in bringing victory to the home team, an asset has been built up that cannot be measured by dollars on the balance sheet.

The Trackless Trolley Comes Back

RENEWED interest in the trackless trolley attaches to the demonstration of the first of its new vehicles recently made by the Utah Light & Traction Company, the news of which was published in last week's issue of ELECTRIC RAILWAY JOURNAL. A total of ten of the new coaches are included in this initial order. Further extension of this type of operation is contingent upon the experience with this first installation.

There is little similarity between these trackless trolleys and those which were put into service at various points in this country several years ago, with varying degrees of success. Some of the earlier installations are still in use. Others have been abandoned. Interest in these pioneer experiments did not spread very far, however, and the electric railway industry as a whole dismissed the trackless trolley as a major factor in the urban transportation situation. Perhaps the rapid improvement which took place in the gas and gas-electric buses had something to do with crowding the trackless trolley out of the picture.

These very developments in the bus, however, have brought the trackless trolley back for further attention and study. Two basic things happened; first, the effort to increase carrying capacity of the bus led to radical changes in chassis design which culminated in the Twin Coach, Versare, and Metropolitan Coach types. The old trackless trolley chassis had been a comparatively crude effort. Awkward appearance, hard riding and mechanical troubles soon checked what little enthusiasm had been created for this type of vehicle. But with the coming of the new chassis developed for buses, the idea of driving a vehicle of this type from an overhead trolley was again resurrected.

Radical changes in electrical equipment, both motors and control, represent the second great change which has

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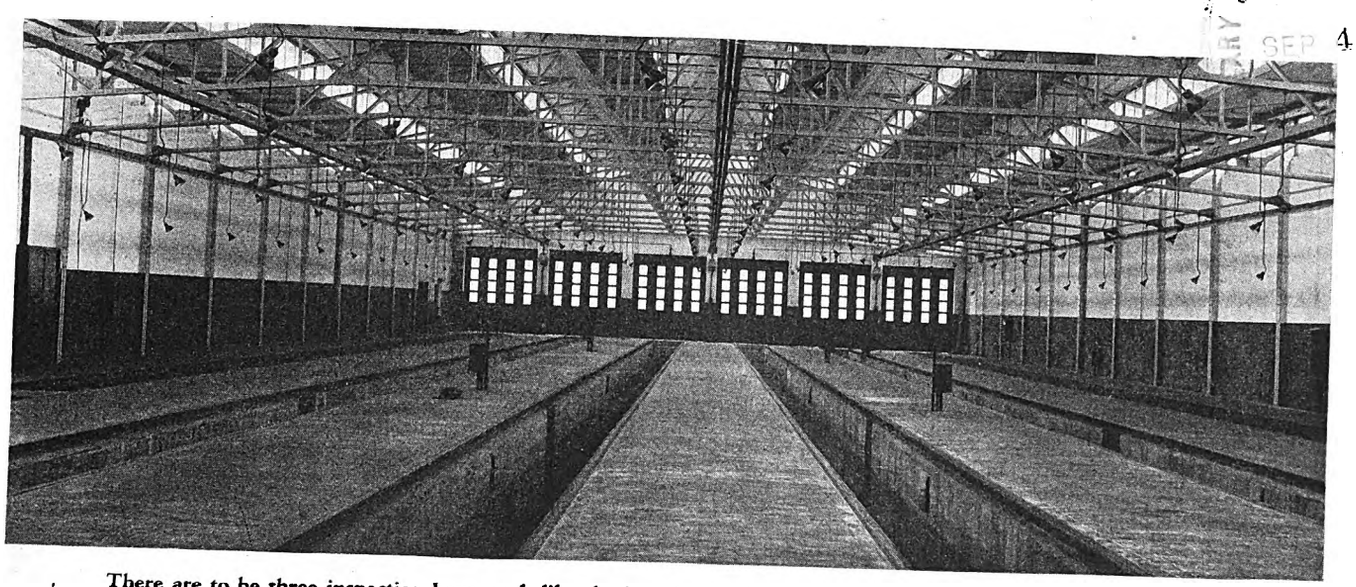


There are to be three inspection bays, each like the bay shown above, with each track long enough to hold a train

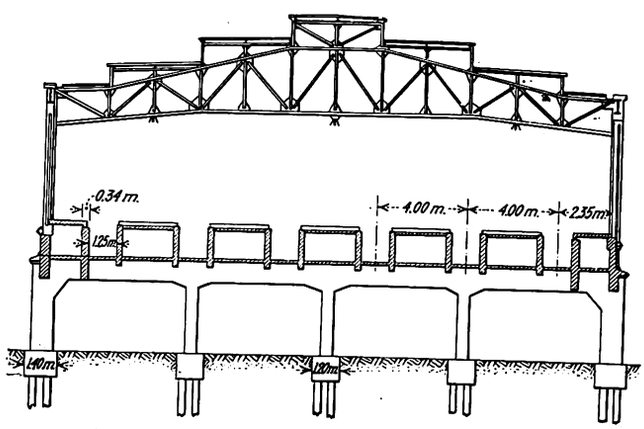
Hamburg Elevated
Increases Facilities

Company completes new operating yard and inspection carhouse. Inspection is conducted by officially trained crews and troubles have been greatly reduced

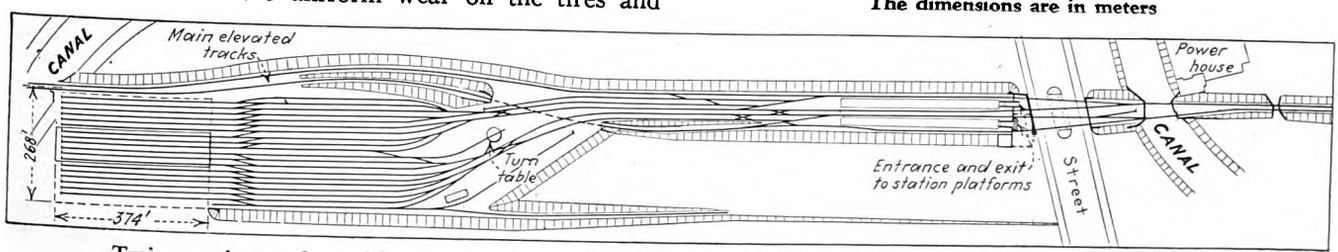
COMPLETION of a new operating yard and inspection car house close to its Stadtpark station gives a material increase in the facilities of the Hamburg Elevated Railway, Hamburg, Germany. These improvements adjoin an earlier carhouse, known as the Barnbeck carhouse. They are also close to the company's power station and repair shops. The layout of new yards and of the final form of the carhouse with eighteen tracks is given in the accompanying plan.

To permit easy entrance and exit of cars between the elevated structure and the new carhouse, the elevated structure at this point is equipped with four tracks. The two in the middle are used for trains entering on or leaving the structure from the carhouse, and each is connected to ten yard tracks. The two outside tracks at this point are for the through trains.

There is a separation of grade where the carhouse tracks cross the main line. Each carhouse track is also protected by signals. The yard is equipped with a turntable to reverse the cars. This is done four times a year to insure a more uniform wear on the tires and avoid sharp flanges. The headquarters for the train employees are in a special building fronting on one track and connected by a bridge to the other track. An-



Cross-section of one bay of inspection carhouse. The dimensions are in meters



Trains can be run from either operating track over any inspection pit, then out to any track in the storage yard

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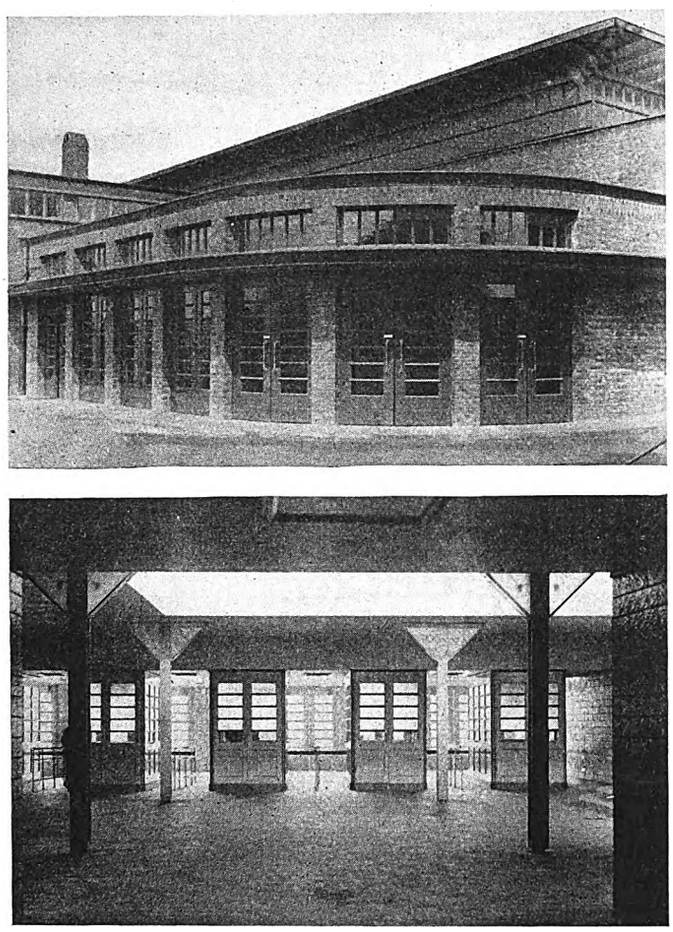


Exterior and interior of Stadtpark station passenger entrance. At times large crowds have to be handled at this station

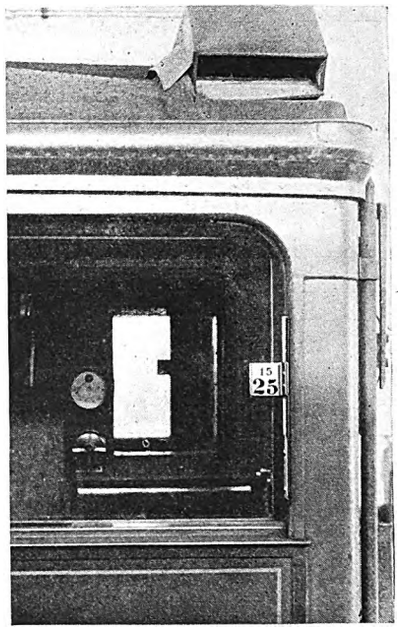
other, but smaller, building has been erected as headquarters for the yard crew. It is near the turn-table.

The carhouse was erected on re-enforced concrete pillars, on account of its great height above the ground. It has plenty of skylights, making its interior very light. All tracks in the carhouse are equipped with pits for their full length, a plan which was necessary because the trains remain in the carhouse only for the short time required for their inspection. They are then run out to make room for other trains.

This switching is done by the use in front of the carhouse of a double row of interconnecting switches. This makes it possible for a train to be operated from any track in the carhouse to any track in the yard. As this means outside storage for the cars at night, the air line pipes of all cars are equipped with a condensation equipment so that their air pipes will not freeze in winter.

The auxiliary rooms required for the work of inspection and light repair, such as wash rooms, toilets, blacksmith shop, machine shop, carpenter shop and storeroom are in the rear part of the carhouse. A large compresser and heating plant is located in the cellar.

The present inspection schedule calls for a fairly detailed division of the work among several crews, each specializing on certain parts of the equipment. These crews handle trains continuously, which means that the time of labor for every member of each crew has to be the same. The plan has worked out very satisfactorily and has been responsible for a considerable decrease of troubles. Previously an average of 34 troubles were reported for every 100,000 car-km., or 62,500 car-miles. At present the monthly average is often as low as seven. Each car carries in its cab window a card showing the date when it should go in for inspection. This card is readily visible from the station platform, so that the withdrawal of a train for the purpose of inspection causes no difficulty. In the illustration the lower large number represents the day of the month for the elaborate inspection, while the upper smaller number indicates the day in which bearings have to be oiled, compressors have to be inspected, brakes have to be adjusted, and the cars are to be given a thorough interior cleaning.



This view shows the way in which each car carries a card to tell when it is due for inspection

The Stadtpark elevated passenger station adjoining the new carhouse has been greatly enlarged and improved, as it has to handle large crowds occasionally. The fare passageways are now equipped with passimeters. The lettering indicating the names of the stations, is now made of wooden block letters instead of being shown by enameled signs. The wooden letters are thought to be more easily read at a distance as they stand out in relief.

Paris Tries Aluminum-Alloy Overhead Fittings

Lighter trolley wire appliances have reduced overhead troubles. Catenary construction also being installed by Paris surface lines

TWO papers presented at the last annual meeting of the French Electric Railway & Bus Association (L'Union des Voies Ferrées et des Transports Automobiles) in Marseilles in November, 1927, give particulars of some interesting developments in overhead construction by the Paris surface lines. They are just made public in the official organ of the association.

The first paper was contributed by Mr. Laspeyres, one of the electrical engineers of the company, and tells of a test in actual service by the company of overhead material made in various aluminum alloys, primarily to reduce the number of trolley wire breaks. Experience has shown that a large part of these breaks occur at points where the overhead wire enters or leaves the ear. It was believed that lighter overhead material would help reduce this trouble. The previous standards for feeder suspension, pull-off and splicer ears had been drop-forged, brass or bronze, which was lighter than the cast ears previously employed and had reduced the breakage over that formerly experienced. It was to secure even better results that the trial was made with aluminum alloys.

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Convention Exhibit Issue

September 22

An Adequate Presentation of the Exhibits and Interpretation of Recent Developments

A "Report Number" for the A.E.R.A. Exhibit

Service No. 3—See page 337

Of the alloys available, duralumin, avi, alferium and francalu were selected for consideration, as they were commercial products, their treatment and properties were known and they were capable of being drop-forged into the forms desired. These alloys contain about 95 per cent aluminum, 0.5 per cent of magnesium, 4 to 5 per cent of copper, a little manganese, and traces of iron and silicon. While this material is not affected by the weather, the company believes that it is probably desirable to use galvanized screws in putting the parts together, and possibly some kind of varnish over the whole appliance, although this question of outside protection has not yet finally been settled.

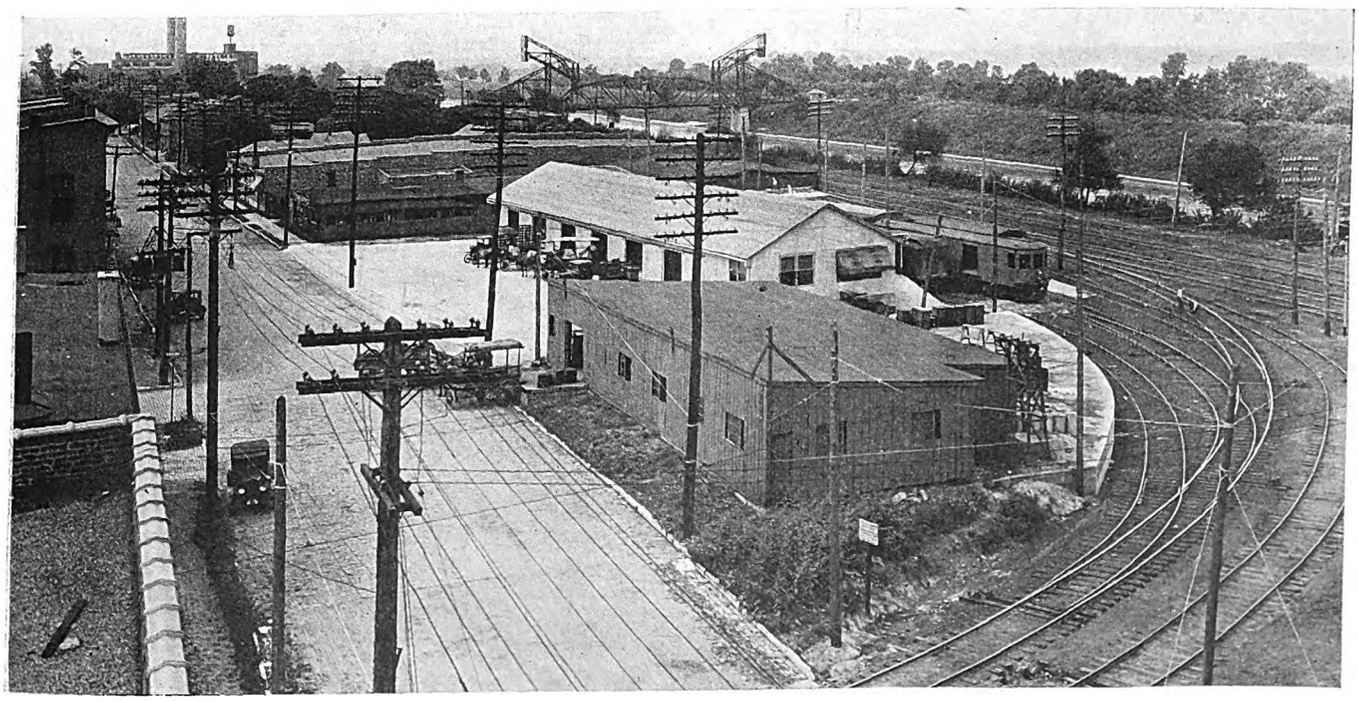
In 1924 the company put in service 100 clamps of avi metal under a variety of conditions, and after 468,000 passages of trolley wheels under them they show no greater wear than would be the case with a brass clamp under similar conditions. Individual appliances weigh only from 38 per cent to 55 per cent as much as corresponding parts made with brass or bronze. The alloys used so far have been avi and duralumin. The cost per appliance is but little if any more than with the heavier material, the scrap value is greater, and a lighter overhead material, particularly at complicated overhead crossings, where much material has to be used, is obtained. Incidentally, the use of aluminum appliances so lighten the whole structure as to make it possible to reduce the size of the supporting structure.

The trial installation made of catenary construction on the Paris surface lines was described in a paper presented at the same meeting by Mr. Henrich, electrical engineer of the company. The installation is purely experimental and is on a section of double track, 2 km. (1¼ miles) in length, where there is considerable traffic. The primary purpose was a reduction of maintenance because of the greater flexibility of the overhead line and a reduction in the number of overhead breakages. Incidentally, it is expected that there will be considerably reduced wear on the trolley wheel and possibilities of higher speed. This is not the only line in France to use the catenary. Lyons and Strasbourg also have it, among others.

The first cost for catenary for a double-track line is reported in the paper to be 7 per cent higher than for ordinary construction, and for single track about 3 per cent higher, but with the possibility of reduced maintenance, the saving may very easily be in favor of catenary construction.

Interurban Builds New Freight Terminal in Louisville, Ky.

RECONSTRUCTION of the Big Four Railroad bridge over the Ohio River connecting Jeffersonville, Ind., with Louisville, Ky., over which cars of the Interstate Public Service Company had been routed for several years has necessitated a change in the handling of the freight and passenger business of that line. Four 29-passenger parlor car buses were put in service between Sellersburg, Ind., and Louisville, operating by way of New Albany, Ind., to handle the passenger but taking care of the heavy volume of freight which moves over the Interstate presented a more difficult problem. It was solved by laying about 600 ft. of twin gage track in New Albany, this being made necessary by the fact that the trolley line connecting New Albany with Louisville was 5 ft. gage, and connecting up with the standard gage track of the Kentucky & Indiana Terminal Railroad. The freight cars of the Interstate are then hauled over



Overhead trolley lines are provided for maneuvering the freight cars on the tracks immediately adjacent to the freight terminal

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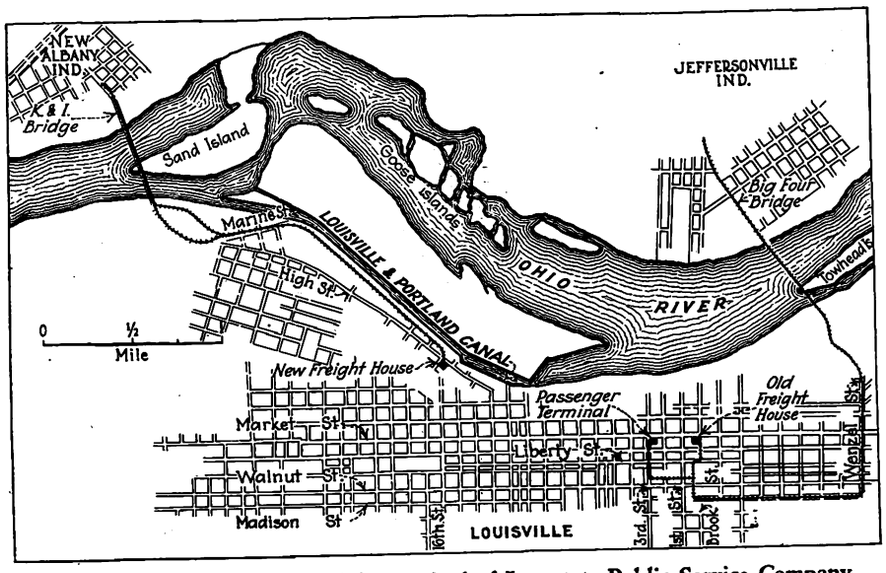


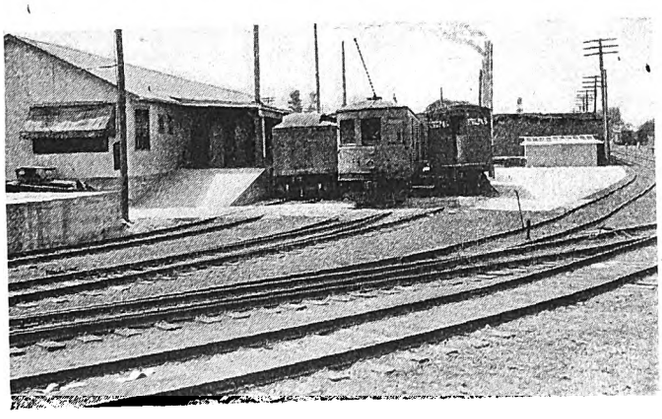
Map showing relocation of freight terminal of Interstate Public Service Company in Louisville, Ky.

the K. & I. bridge from New Albany to Louisville by steam locomotive.

When operating over the Big Four bridge the trains of the Interstate Public Service Company had been routed through Louisville along Wenzel and Madison Streets to Brook Street, as shown in the accompanying map. The freight terminal was located on Brook Street and access to the passenger terminal, three blocks distant, was provided by a private right-of-way paralleling Walnut Street to Third Street.

As the tracks of the K. & I. Terminal Railroad, over which entry to Louisville was made, did not run anywhere near the Brook Street freight terminal it became necessary to construct a temporary freight depôt at some point adjacent to that road. Accordingly a point was selected at Sixteenth and High Streets on which a temporary structure was erected. As previously stated the Interstate freight cars are hauled to this point by steam locomotive, but in order to facilitate the movement of cars around the new yard a complete system of electrical overhead was erected.

While this new arrangement has been regarded as only a temporary relief pending the reconstruction of the Big Four bridge the new freight house location has proved so satisfactory as a local distributing point that it may be found desirable to continue it permanently after the bridge is completed. There is a heavy movement of freight over the Interstate line through Louisville to steam railroad connections serving territory east of the Mississippi and south of the Ohio River.



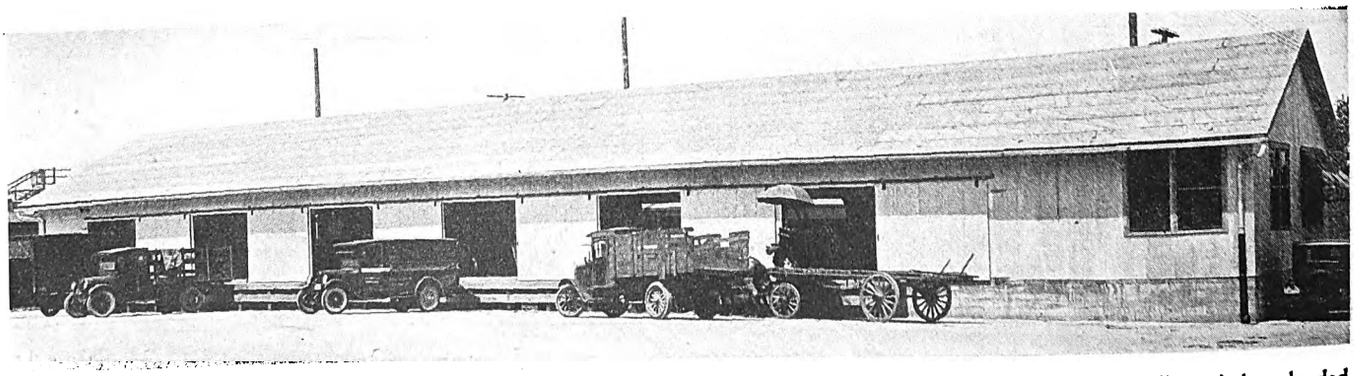
A wide platform extending the length of the freight house facilitates handling shipments

Safety Display in Asbury Park

This car was one of the features of Safety Week in Asbury Park

SAFETY WEEK in Asbury Park and vicinity was sponsored this year by the American Legion, together with the Chamber of Commerce, the Rotary Club, Kidwanis Club and various other civic bodies.

The Eastern New Jersey Power Company and the Coast Cities Railway entered heartily into the campaign. The car shown in the illustration was part of their contribution in this important work. It was operated during Safety Week, early this summer, over the lines of the company.



Six wide doors on the side opposite the unloading platform permit the transfer of freight to trucks almost as rapidly as it is unloaded

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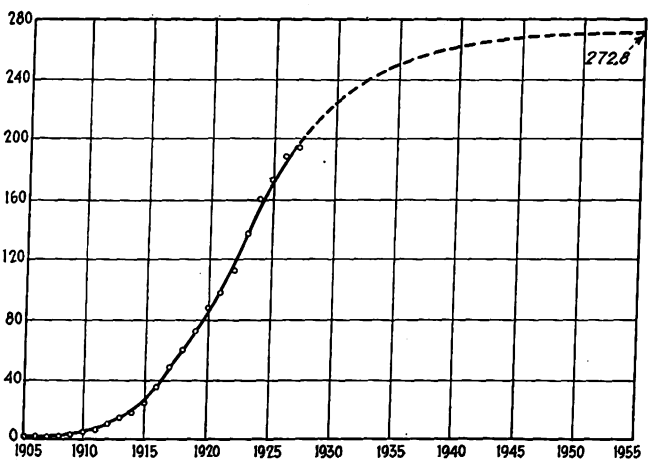
State Curves Point to Automobile Saturation

FORECASTING automobile increase from the experience of the past 23 years, Robert Whitten, city planning consultant, New York, writing in the *American City Magazine* for August, attempts to predict the saturation point. Thereafter the number of automobiles will increase, he believes, only as the population increases.

One way to forecast the growth of an artificial phenomenon is to establish its relationship to some natural phenomenon that grows in accordance with rather well-defined laws. In the case of the motor vehicle, population is the most obvious thing with which to attempt to establish a relationship, and the relationship that it is most convenient to study is the number of motor vehicles per 1,000 persons.

In an accompanying chart are shown the curves of motor vehicles per 1,000 persons for the United States and for various individual states from 1913 to 1927. The



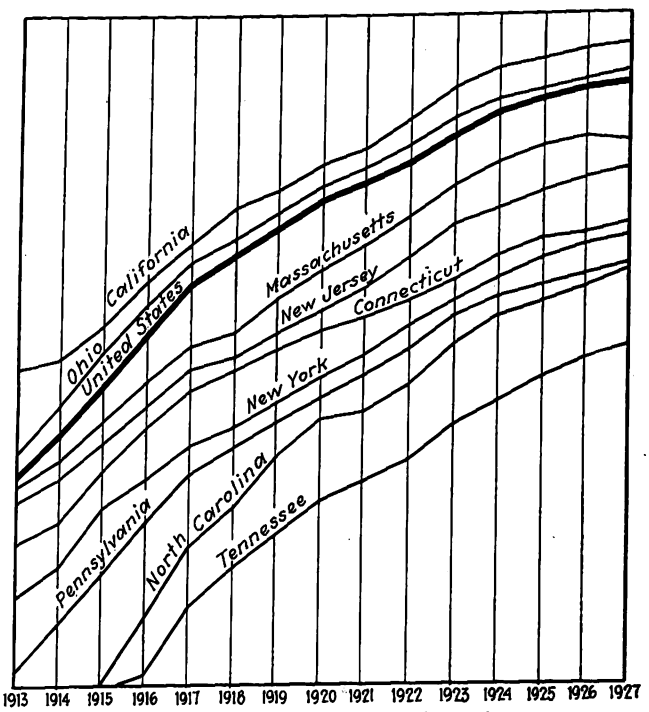
Motor vehicles per 1,000 persons in the United States with forecast to 1955

POPULATION AND NUMBER OF MOTOR VEHICLES IN THE UNITED STATES WITH FORECAST TO 1955

Year	Population	Number of Motor Vehicles	Motor Vehicles per Thousand Persons	Persons per Motor Vehicle
1900	75,995,000	8,000	0.11	9,499.4
1905	83,984,000	78,000	0.93	1,076.7
1910	91,972,000	468,500	5.1	196.2
1915	99,195,000	2,445,666	24.7	40.5
1920	105,711,000	9,231,941	87.1	11.5
1925	115,378,000	19,937,274	172.7	5.8
1930	120,200,000	26,973,000	224.4	4.5
1935	128,000,000	31,936,000	249.5	4.0
1940	135,800,000	35,525,000	261.6	3.8
1945	143,000,000	38,210,000	267.2	3.7
1950	152,200,000	41,155,000	270.4	3.7
1955	160,850,000	43,687,000	271.6	3.7

curves are drawn on a semi-logarithmic scale, but have been moved vertically to show to better advantage the slope of the individual curves. They show the relative rates of growth in the various states, but indicate nothing as to the actual magnitudes. While the curves have been moved so that they do not bear a true relation to one another except as to slope, they have been arranged as they stood in 1927 with the highest, California, at the top, and the lowest, Tennessee, at the bottom.

These curves are all approximately parallel. The scale is semi-logarithmic, so that the straight line from 1913 to 1917 indicates that the number of motor vehicles per 1,000 persons increased at a uniform percentage rate during this period. In 1917 the United States entered



Motor vehicles per 1,000 persons in the various states

No vertical scale is shown, as the curves have been moved up or down to prevent their crossing and recrossing each other. The vertical scale is logarithmic, however, so that the rates of increase may be compared, though not the actual magnitudes

the World War. This did not cause a change in the nature of the increase; it continued at a uniform rate, but slower. In 1923, however, something different happened. Apparently, the turning point in the increase in automobiles with respect to population was reached in that year, and thereafter the increase has been at a constantly decreasing rate. When anything increases at a decreasing rate, it is approaching a limit. If the increase at a decreasing rate has been going on for a sufficiently long time so that the rate of decrease in the increase can be found, the limit can be determined. In this case, however, we have only four points since 1923, so that the trend indicated must be used with caution.

Up to the present time the curve of growth has resembled that of various organisms and is similar to the Pearl-Reed curve of population growth. Projecting the curve of automobile growth according to an accepted mathematical formula, Mr. Whitten reaches the conclusion that 272.8 is the upper limit of automobiles per 1,000 persons. This is twice the 1923 figure.

While the upper limit of 272.8 motor vehicles per 1,000 persons, or 3.7 persons per car, will theoretically never be quite reached, the approach to it by 1945 will be so close that for all practical purposes we may say that the economic limit will be reached by that year and that thereafter the number of motor vehicles will increase only as population increases. Moreover, of the total increase in the ratio of cars per 1,000 persons, 77.8 per cent will occur within the next ten years, or by 1937.

Four Convention Dailies

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Service No. 4—See page 350.

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Reducing Noises in Street Cars

By Silas B. Tobey,
Menominee & Marinette Light & Traction Company, Menominee, Mich.

Editor's Note.—This article is condensed from the report presented by the author to the Wisconsin Utilities Association, Transportation Section, as a summary of the work done during the year under the fellowship established by that body at the University of Wisconsin. A report of the earlier investigation was published in this paper, issue of Sept. 11, 1926, page 413.

THREE years ago Kent Woolridge started the study of noises in electric traction cars in connection with a fellowship established at the University of Wisconsin by the Wisconsin Utilities Association, Transportation Section. His work consisted mainly of developing apparatus for the measurement of noise. The following year Erwin Summers assumed the fellowship and continued the work, spending most of his time modifying and perfecting the instruments to meet the needs of the tests. It was with this perfected measuring apparatus that the investigation was resumed this past year.

Tests were commenced the latter part of October, being confined for the first part of the school year to the measurement of noises from points outside the car. During the latter half of the year the tests were carried on inside the car proper.

The apparatus used in this study consisted of a sound pick-up and a recording device. This latter consisted of a microammeter and a mechanically-operated stylus which translated the noise into curves varying in height with the intensity of the disturbance.

Tests Made in Cars and at Curb

For the outside tests this apparatus was placed in a car at the side of the street where the pavement was to be tested. As the street cars passed the instrument recorded the accompanying noise. A large number of runs were taken on various streets and the maximum points on the graph for each street were averaged so that the average noise intensity for each type of pavement could be determined. These averages were then used in comparing the sound absorbing ability of the various pavements.

The tests in the cars were made to get two different comparisons. The first was to get the comparison of the effect of various pavements on the intensity of the noise heard by the passengers. This was done by making runs in each car over the same pavements. For example, the tests on many of the cars in Wausau were made over concrete streets with rail filler, wood ties, Dayton mechanical ties, brick, and asphalt macadam pavement. The tests were repeated in Madison and Milwaukee so that a number of different types of pavements could be compared.

The second comparison to be made from the inside tests was that between the different types of cars. To do this, tests were made in each car as it was run over a pavement common to that over which the other cars were tested. In Milwaukee, for instance, a number of cars were tested over Vliet Street between 40th and 60th.

Soft Street Surfaces Prove Quietest

The Madison tests on the outside of the car were the most important ones of that type and gave the best idea of the contribution of the pavement to the noise from the passing street cars that reaches the ears of the pedestrian. The types of street tested in this manner were concrete macadam, brick, creosote block and dirt. As might be guessed the street with the rougher and the softer surface was the quietest. When the dirt street froze, however, the passing cars made much more noise. These tests showed that the macadam street was more quiet than the brick and the brick more quiet than the concrete.

Inside tests in all of the cities mentioned gave results which are worth considering. As mentioned before, the aim of these tests inside of the cars was to determine the effect of various types of track construction and pavement on the noise which reached the passengers and the effect of the various parts of the cars in producing noise.

The effect of the pavement can best be shown from the tests in Madison and in Wausau, although those in Milwaukee gave some valuable information. The inside tests showed, as did those on the outside of the cars, that the concrete was the most noisy of all pavements, other things being equal. This was proved to be true in all three cities. The fact that a street is covered with a plastic material such as asphalt reduces its sounding board qualities and makes the cars seem more quiet to the rider. Another thing that proved to be of value in reducing the noise in the car was the rail filler such as is used in Wausau. Mr. Woolridge found this to be true from his tests also. Streets where tracks were laid on Dayton mechanical ties were compared with similarly surfaced streets having wood ties. It was found that the mechanical tie absorbed as much, if not more, noise than did the wood. The thermit joint, however, proved to be the greatest noise reducer in track construction encountered in this study. It tended to reduce the propagation of car noises better than the other elements could absorb the noise produced.

In these tests the brick pavement proved to be more quiet than the concrete, and the macadam, water-bound or tar-bound, more quiet than the brick. Very little creosote block pavement was tested and so conclusions as to its qualities as an absorber of car noises are merely guesswork as far as this study is concerned.

In these inside tests it was noticed that if dust or dirt, be it sand or tar, is on the track the noise that reaches the passengers is much increased.

Reducing Noise in the Car

The final comparisons to be made with the data from the tests inside of the car were those of the different type cars. Because of the many variables it was very difficult to determine just what was the best method of reducing the noise within the cars themselves. Cars with spur gears were tested and compared with other cars of the same type, but with helical gears. It was found that the helical-geared car was just as noisy as the other. Other things, such as the effect of the size of the wheels and the type of trucks were investigated, but to no avail. There were three things which might seem obvious, however, which were proved. The first and the least obvious was that the type and number of seats in the car does affect the intensity of the noise in the car. It was found that the softer and the larger the number of seats in the car the more quiet it seems on the inside. The next thing was that the practice of putting an insulating material between the inside and the outside walls of the car not only keeps the heat in but also the noise of the trucks out. The last and the most obvious point proved was that the flat wheel is the worst noise maker on the car. It is known by every one but where is there a street car system wholly free from this defect?

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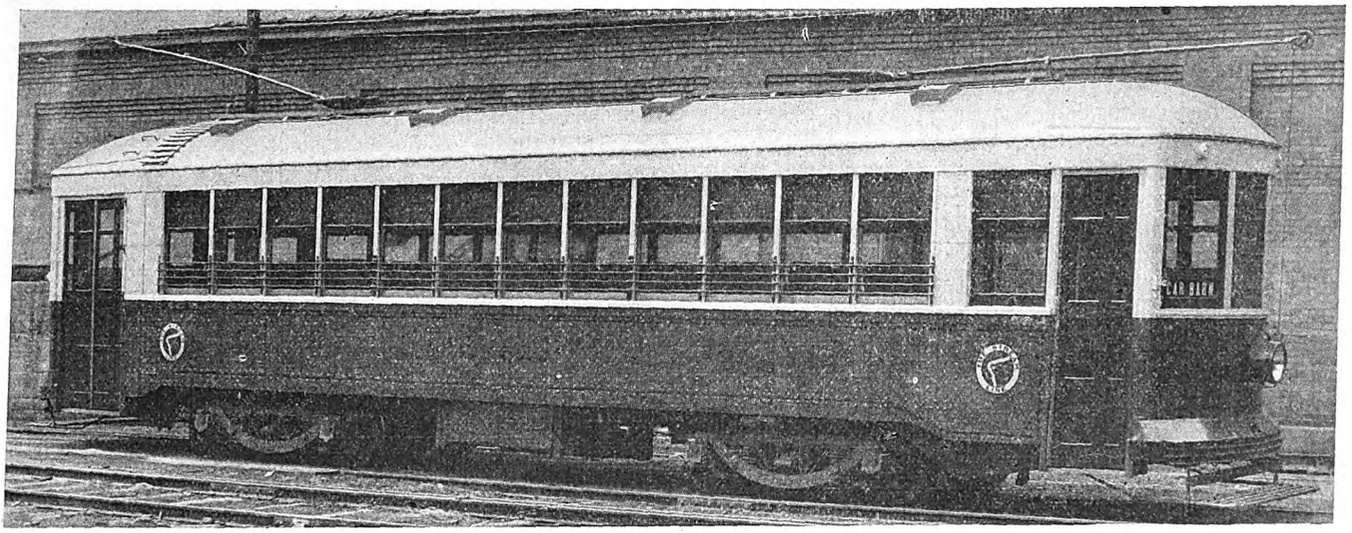


The lower panels are finished in a lemon yellow with black trim, while a cream color is used above the window ledges

Ohio Interurban Modernizing Its Cars

De luxe seats, better light, smaller wheels, and ramps replacing the vestibule steps are some of the improvements

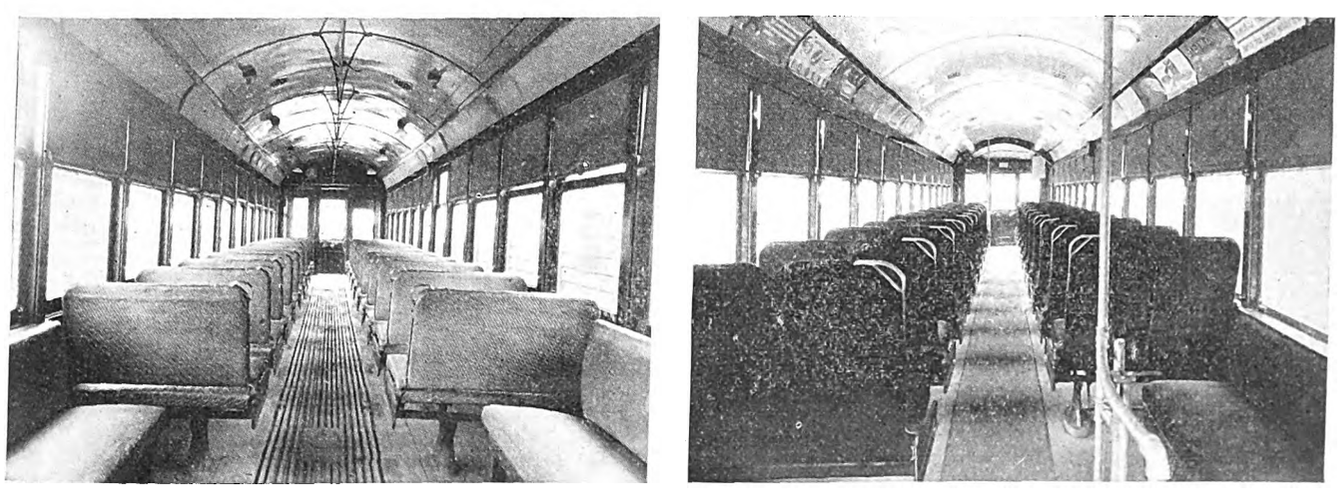
SEVEN of the nine interurban cars being rebuilt by the Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio, have been completed and placed in service. The first car to be finished was returned to service on Jan. 6. The other six were completed at succeeding intervals of about one month.

The rehabilitation work includes the substitution of a ramp for the inside step in each vestibule, eliminating the closed bulkheads, rearranging the equipment in the motorman's compartment, installing de luxe seats and better lights, refurnishing both the exterior and interior, and remodeling the trucks, using smaller wheels. Four of the cars are of combination steel and wood construction and were built by the Kuhlman Car Company. The remaining five are of all-steel construction and were purchased from the Cincinnati Car Company. The wood and steel cars as reconstructed weigh 24 tons; the all-steel cars weigh 25 tons.

The vestibules and inside floor which were formerly at different levels are now joined by ramps. These ramps have a slope of $3\frac{5}{8}$ in. from bolster to center post, and another slope of 2 in. from this point to the front of the crown sheet. In the vestibule proper the floor slopes 1 in. each way from the center line.

Uninterrupted passage from the car vestibules to the body of the car has been obtained by the elimination of closed bulkheads. This change necessitated extra bracing at the former bulkhead location in the car body. The narrow arch at this point is strengthened inside with a $\frac{1}{4}$x$1\frac{1}{4}$-in. angle across the ceiling. Three-inch channels extend the full length of the body from corner post to corner post, just below the top rail. The platform framing is given additional strength by $\frac{1}{4}$x4-in. channel braces from the body bolster to the car bumper. On the two-door side of the car a $\frac{3}{16}$x4-in. channel gives added support.

On five of the cars, folding doors, built in a unit with the door frames enclose the inside step wells. On the other cars the construction differs. Each of these has double two-part folding doors at the diagonal left-hand corners of the car for loading passengers and single-part folding doors at the opposite corners to assist the unloading from the motorman's end of the car. The door engines have been concealed over the doors.



At left—Interior of one of the cars before being rebuilt. At right—The same car with plush seats substituted for the old type, the fare register equipment removed and new dome fixtures installed

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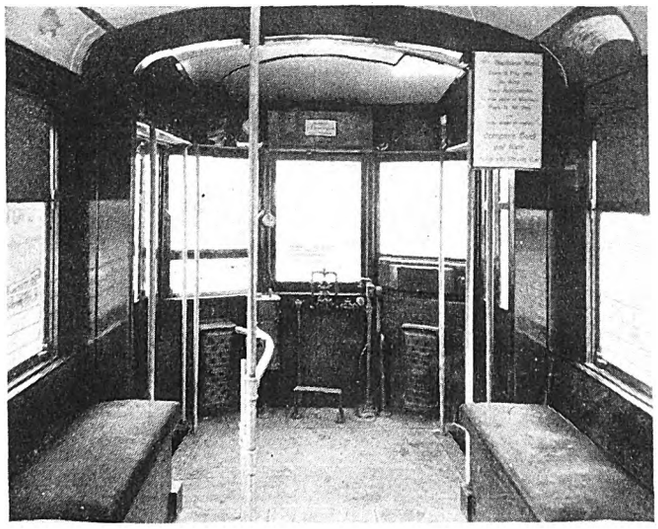
Two 1-in. pipe stanchions from floor to ceiling, and spaced about 3 ft. apart, are connected by a horizontal pipe at waist height. The fare box and door valve control are carried on these stanchions. All switches in the motorman's compartment are mounted in neat cabinets over the front windows of the car, and practically all air piping has been covered with a panel extending the full width of the car beneath the windows. The only equipment visible other than the control box and the air brake handle is an Economy meter and a hand brake rod. The lower sash in the left-hand front window can be raised to provide direct ventilation.

The cars have transverse seats for 44 passengers and longitudinal seats for 12 passengers, giving a total seating capacity of 56. Brill winner seats covered with dark green plush are used. The seats have pressed steel pedestals and the seat backs have polished nickel handles on the corners. The seats are 37 in. wide and are spaced 32 in. apart. The width of the aisle is 22 in.

Artificial illumination is given by two rows of eight



Air pipe and wiring have been concealed as far as possible in the vestibule. This view also shows how the cars appear with the closed bulkheads removed

Ivanhoe units, located directly over the seats. There are a total of twenty lamps in the car. They are wired in series but have special switching circuits which permit the darkening of the two units at either platform end, depending on the direction of travel.

The interior woodwork has been finished in a dark red mahogany enamel. The arched ceilings have been enameled in an old ivory cream. Several shades of enamel were experimented with before the old ivory cream was selected. The side windows have Pantasote curtains, mounted on Rex all-metal curtain rollers. The windows themselves have Rex brass sash frames.

The outside of each car is painted a combination lemon yellow and cream, the lower panels being in yellow and the upper ones in cream. A narrow black trim is used on the lower panel, which extends the full length of the car body. The window frames of dull brass have been left in a natural metal finish. The whistles with which all the cars are equipped are located under the floors instead of on the roof, to eliminate objectionable oil spray on the car front. Nichols-Lintern classification lights have been installed on both ends of the cars. Hunter destination and route signs are located in the bottom sash of each right-hand vestibule window.

In remodeling the trucks 28-in. wheels were substituted for the 33-in. wheels formerly used, and elliptic springs were installed. Steel top plates, measuring $1\frac{1}{8}$ x 3 in. have been added and $\frac{3}{4}$-in. mild steel plates have been substituted for the cast steel gusset plates.

The Reader's Forum

News—No Matter Whence It Comes

NEW YORK, N. Y., Aug. 20, 1928.

To the EDITOR:

It will be unfortunate if the point of your editorial "Real News Still in Demand," published in the Aug. 18 issue, is lost on any of your readers. It points out and underscores real truth.

A news story is a story no matter whence it comes and no one knows this better than the newspaper editor. There is news in the operations and daily affairs of the utility companies and they have every right, legal and moral, to send information about themselves to newspapers.

True, not everything the utility companies do is news and undoubtedly executives untrained even in the rudiments of newspaper practice have tried from time to time to make news appear where it was non-existent. There can be no excuse for using up somebody's good white space in pure propaganda. But even in propaganda there may be news. Witness the spreads the political utterances of our aimers at the Presidency get in the newspapers. Propaganda, all right, but news, too.

Mark you this: the newspaper editor needs no guardians, well-meaning friends or anti-publicity crusaders to save him. He is over 21, very much on the alert; retains his ability to pick the worthwhile from the buncombe and, above all, still is able to tell news when he sees it.

The public utilities information bureaus have every right in the world to exist and the industry has every right to maintain such bureaus. Granted that they are doing their job right, that is, sending out legitimate news to the press of the country, there is no legal warrant for telling them to stop. Transportation and power are needs we all share. Surely in the background of these great public services there is news.

Publicity is an agency by which the news of an organization, whether it be a corporation or what not, is brought into the light of day. There is no conflict here with paid advertising, for which, in the "moving of the goods from the shelves," there is no adequate substitute possible. But there are developments in the utilities which are essentially news, that is, from the standpoint of the newspaper man. These stories belong in the news columns.

Once upon a time (in my own day as a newspaper man) there was a great hue and cry about the difficulty we had in getting even the time of day from the corporations. Now they will see reporters, will tell something about themselves, and the cry goes up about space-grabbing and such. Mayhem, arson and high treason seem only misdemeanors when compared with the crime of preparing a release and sending it to the local or national newspapers.

Real news still in demand? You bet it is.

ONE OF THE FEW.

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Electric Railway Journal Maintenance Data Sheet

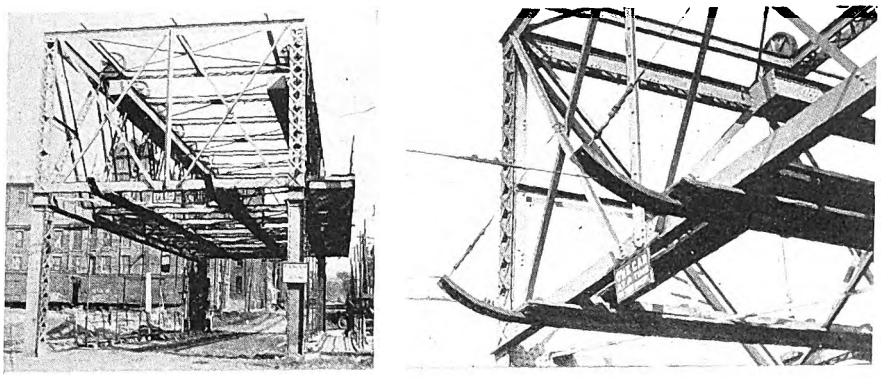
TRACK AND WAY DEPARTMENT—34

Trolley Trough for Low Headroom*

By H. E. Bean
Engineer of Way and Structures
New York State Railways, Syracuse, N. Y.

WHEN clearance is small between car roofs and overhead bridges or other structures, difficulty is often encountered in preventing dewirement with consequent bending of trolley poles, damage to overhead or equipment and delays to cars. The installation of 8-in. steel channels, as shown in the accompanying illustration, has proved more satisfactory on lines of the New York State Railways than the regulation trolley wire suspensions of bridge hangers or angles.

With this construction dewirements are infrequent, even when bent poles



At left—Eight inch channel trolley trough under New York Central and Delaware & Western overhead bridge, West Genesee Street, Syracuse, N. Y. At right—Close-up of end construction

*Submitted in Electric Railway Journal Prize Contest.

(OVER)

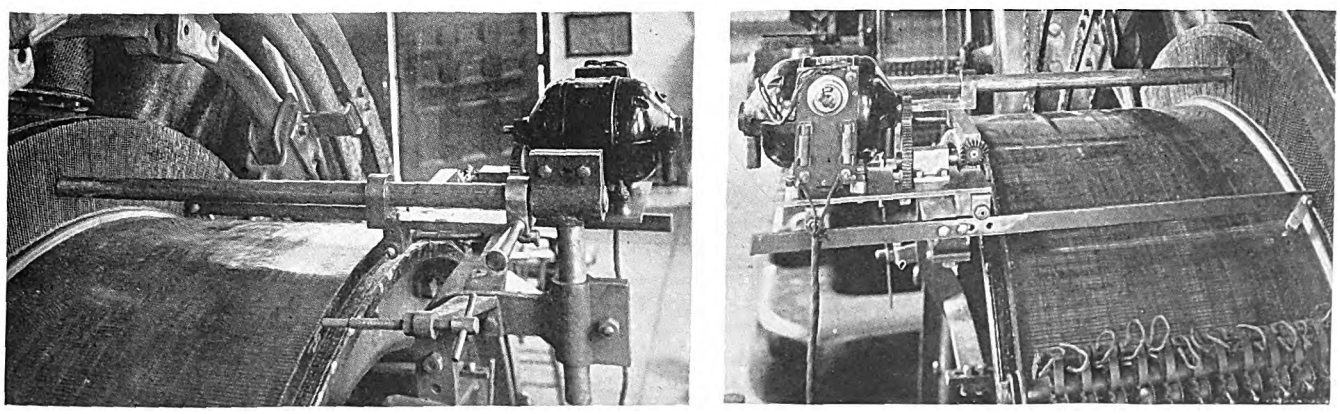
Electric Railway Journal Maintenance Data Sheet

POWER AND ELECTRICAL DEPARTMENT—7

Commutator Slotting Device*

By G. Hopper
Electrical Department Toronto Transportation Commission, Toronto, Ont.

FOR slotting the commutators on 1,000-kw. rotary converters of the Toronto Transportation Commission, a device has been designed which cuts three slots at a time. The three milling saws and the motor, which are rigidly connected, move horizontally on two guides which parallel the face of the commutator. These guides are supported by a frame which is fastened by means of a split collar around the main shaft. The device is brought into proper alignment by the adjustment of two thumb screws, and when once set the whole commutator may be cut without further adjustment. The depth of the cut may be varied by adjusting another thumbscrew. The whole device is counterbalanced by a suitable weight which is rigidly suspended from the collar on the shaft.



Commutator slotting tool in place for slotting commutator of rotary converter

*Submitted in Electric Railway Journal Prize Contest.

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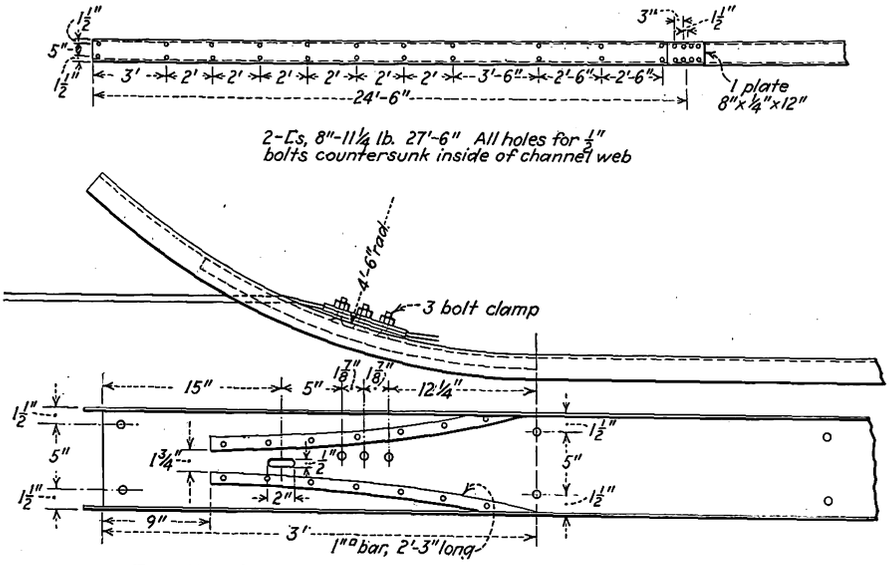
Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—34



Details of construction of 8-in. channel trolley trough

The channel is bolted to a 2-in. plank platform 40 in. wide, which is bolted to 2x4-in. stringers, and the stringers are bolted to the bridge.

ride the channel on the elbow. Insulation is secured by proper spacing of bolts through the energized channel with those supporting the wooden platform over it. The platform is secured by wooden cross stringers, which are bolted to the overhead structure. However, the headroom and amount of moisture present are factors that determine insulation methods and requirements. The New York State Railways, Syracuse division, has made three such installations.

**Submitted in* ELECTRIC RAILWAY JOURNAL *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

POWER AND ELECTRICAL DEPARTMENT—8

Safety Cover for Acid Pots*

BY JULIAN M. SCOTT
Assistant Superintendent of Rolling Stock Montreal Tramways, Montreal, Canada

WHEN a mechanic was dipping a large bolt in a pot of acid to prepare it for tinning an accident of serious nature occurred recently in one of the shops of the Montreal Tramways. He and other mechanics had done exactly the same thing in exactly the same way a great number of times previously without trouble, but on this particular occasion for some unknown cause a violent eruption occurred when the bolt was inserted. Acid was scattered in every direction and some lodged in the man's eyes. By prompt treatment permanent injury to the workman was prevented.

Safety cover as used on acid pot in shops of the Montreal Tramways

To prevent a repetition of this kind of accident, a cover with a hole and collar was made for each acid pot. The hole is just large enough to admit easily the largest soldering bolt. The accompanying ilustration shows the construction.

**Submitted in* ELECTRIC RAILWAY JOURNAL *Prize Contest.*

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—33

C.E.R.M.M.A. Uniform Charges

APPENDIX (A)
Air Brake Material

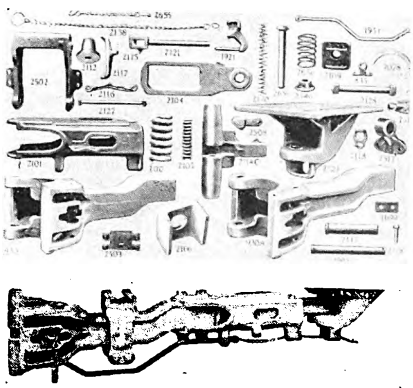
Item Details	8-in. Equipment Pc. No.	8-in. Equipment Charge	10-in. Equipment Pc. No.	10-in. Equipment Charge
1 Brake cylinder and reservoir complete	69816	$20.35	69818	$25.58
2 Cylinder body	67928	6.60	68426	7.70
3 Piston and rod	1246	2.07	5037	2.71
4 Hollow piston rod	3626	0.83	3636	0.83
5 Cylinder non-pressure head	1217	1.32	1104	2.07
6 Follower stud and nut	2305	0.06	2305	0.06
7 Follower	1142	0.14	1108	0.42
8 WABCO packing cup	68578	0.69	68579	0.83
9 Cylinder release spring	1110	0.83	1110	0.83
10 Cylinder gasket	1147	0.05	1147	0.05
11 Cylinder head bolt and nut	4883	0.06	4883	0.06
12 Reservoir stud and nut	4887	0.08	4887	0.08
13 Reservoir and drain plug	2439	9.08	21838	11.00
14 Reservoir cylinder bolt and nut	4889	0.06	4889	0.06
15 Reservoir drain plug	33310	0.03	33310	0.03
16 1¼x22-in. draw bar hose with tapped and union nipple for 1-in. pipe	46622	$1.50	46622	$1.50
17 1¼x22-in. draw bar hose with tapped and union nipple for 1¼-in. pipe	47080	1.85	47080	1.85
18 1¼x18-in. hose with 1¼-in. nipple and FP-5 coupling	46295	1.65	46295	1.65
19 1¼x18-in. hose with 1-in nipple and FP-4 coupling	46591	1.60	46591	1.60
20 1-in. self locking angle cock	22416	2.45	22416	2.45
21 1-in. angle cock with plain handle	.....	2.31	.....	2.31
22 1¼-in. self locking angle cock	22413	2.75	22413	2.75
23 1-in. cutout cock	2135	1.84	2135	1.84
24 1¼-in. cutout cock	2092	2.04	2092	2.04
25 1-in. centrifugal dirt collector	75751	1.84	75751	1.84
26 1¼-in. centrifugal dirt collector	75753	2.29	75753	2.29
27 Release valve	2416	0.92	2416	0.92
28 Release valve rod with or without cotter key and staple	.....	0.08	.....	0.08
29 Pressure retaining valve	3216-1	1.63	3216-1	1.63
30 Triple valve complete	1717	22.53	4870	22.53
31 Triple union	.....	0.17	.....	0.17
32 Triple union nut	1749	0.15	1749	0.15
33 Triple union swivel	1750	0.13	1750	0.13
34 Triple cylinder bolt and nut	10836	0.06	10836	0.05
35 Triple union gasket	.....	0.03	.....	0.03
36 Triple valve gasket	2427	0.08	4886	0.10

Fittings

	Charge ⅜-In.	½-In.	¾-In.	1-In.	1¼-In.
37 Pipe, black iron	0.04	0.05	0.06	0.08	0.11
38 Elbow, malleable	0.07	0.08	0.10	0.15	0.17
39 Couplings	0.06	0.07	0.08	0.11	0.14
40 Tees, malleable	0.07	0.08	0.10	0.15	0.17
41 Union, lip or gasket type	0.11	0.12	0.15	0.18	0.25
42 Nipples, 12 in. or less	0.06	0.07	0.09	0.12	0.15
43 Straight Ells, malleable	0.07	0.08	0.14	0.17	0.25
44 Reducers 1 to 1¼ in.	....	....	....	....	0.07

APPENDIX (B)
WEIGHTS AND CHARGES ON NO. 930-A AND NO. 930 VAN DORN COUPLER PARTS

Part No.	Description	Weight, Lb.	Charge
930-A	Head	260	$31.75 blank; 33.23 drilled
930	Head	240	29.33 blank; 30.83 drilled
2114-C	Knuckle	80	12.05
2115	Lock	5.84	1.80
2116	Lever, unlocking	2.40	0.85
2117	Knuckle throw	3.60	1.10
1003	Knuckle pin	7.50	0.52
2119	Unlocking lever pin	0.50	0.15
2120	Locking spring	.....	0.35
2118	Washer, spring stop	1.12	0.40
1921	Lock set	4.25	1.25
2121	Stem, guide	.....	0.40
2124	Pin, riveting	.....	0.12
1951	Uncoupling rod	10.94	0.92
2138	Uncoupling chain	.....	0.68



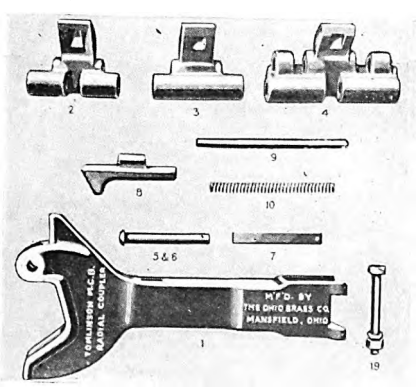
(Continued on Data Sheet No. 34)

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—35

C.E.R.M.M.A. Uniform Charges—(Continued from Data Sheet No. 34)

Tomlinson M.C.B. Car Coupler
FORM 13—REPAIR PARTS



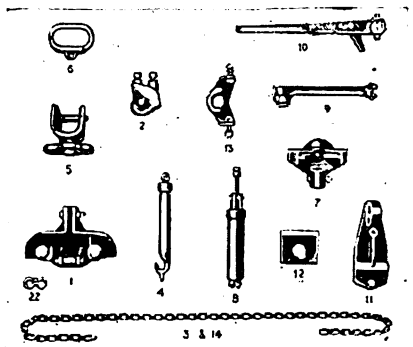
Cat. No.	Part	Description	Charge
14500	13	Draft gear housing	$13.00
14501	14	Follower block	3.25
14502	15	Front follower	1.00
14503	16	Rear follower	0.80
14504	17	Draft bolt	1.00
14505	18	Pipe cleat with bolts and lock washers	1.00
14496	19	1½-in.x9½-in. large bolt with nut and lock washer	1.25
14464	20	Draft spring	2.25
14471	21	Follower block pin with ¼-in. cotter	0.50

Chain Uncoupling Parts

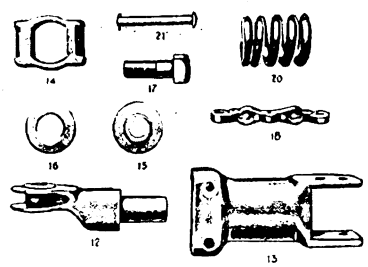
Cat. No.	Part	Description	Charge
12835	1	Double sliding clevis	$2.00
12836	2	Chain guide with attachment bolts	0.75
12837	3	Uncoupling chain, per ft.	$0.10
12838	4	Uncoupling hook with spring	1.50
13277	5	Uncoupling bracket with pin	1.00
12840	6	Uncoupling handle	0.30
14965	22	Uncoupling ⅝-in. repair link	0.06

Lever Uncoupling Parts

Cat. No.	Part	Description	Charge
14524	7	Sliding clevis	1.30
14525	8	Spring barrel	1.65
14526	9	Center lever	0.85
14527	10	Side lever	1.60
14528	11	Side bracket	1.15
14529	12	Center bracket	0.30
14530	13	Chain guide	0.85
14531	14	Uncoupling chain, per ft.	0.10



Tomlinson M.C.B. Car Coupler
FORM 13—REPAIR PARTS



Tomlinson M.C.B. Car Coupler
FORM 22—REPAIR PARTS

No. 15206— Complete M.C.B. Form 22 coupler equipment for single end including coupler with draft gear, anchorage, uncoupling device, spring draw bar carrier and slide bar with supports $180.00

(Continued on Data Sheet No. 36)

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—34

C.E.R.M.M.A. Uniform Charges—(Continued from Data Sheet No. 33)

Van Dorn Coupler Parts (Concluded)

Cat. No.	Description		Charge
2101	Draft housing	106.50	15.98 blank 17.40 drilled
2104	Draft yoke	63	9.45
2106	Spacer	10	1.72
2109	Follower washer	7	1.50
2110	Draft spring (outside)	26	1.90
2128	Draft bolts and grip nut	.....	0.98
2105	Dratt spring (inside)	4.00	0.56
2102	Anchor	135	16.20
2147	Anchor pin	8.06	0.85
2127	Carrier bolt	1.50	0.25
2502	Carrier top	42.50	8.20
2503	Carrier bottom	14.50	3.80
2516	Carrier bracket	3.00	0.85
2517	Housing bracket	3.00	0.85
2078	Radial bar	84.50	5.10
2112	Radial bar thimble	1.78	0.45
1669	Radial bar stop	0.85	0.15
1835	Bracket	1.30	0.70

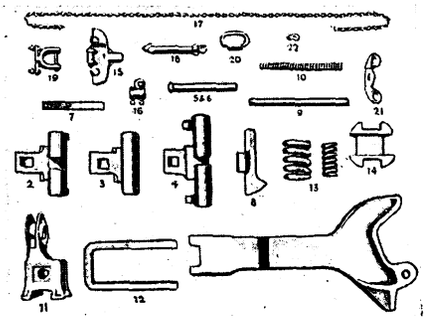
Above charges F.O.B. Chicago, Ill.

APPENDIX (C)

Tomlinson M.C.B. Car Coupler—Form 12

Cat. No.	Part	Description	Charge
14495	1	Coupler body with knuckle springs	$29.00
10673	2	Standard split knuckle	8.75
11024	3	Solid knuckle	10.00
14485	4	High knuckle, 16-in.	11.50
14236	5	Knuckle pin for standard knuckle	0.85
14486	6	Knuckle pin for high knuckle	0.90
14237	7	Knuckle spring	0.25
14497	8	Forged sliding lock	5.00
13884	9	Sliding lock pull rod	0.30
13885	10	Sliding lock spring	0.40
12831	11	Tailpiece	7.50
12832	12	Draft gear yoke	4.25
12833	13	Double coil draft spring	2.25

FORM 12—REPAIR PARTS



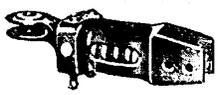
Cat. No.	Part	Description	Charge
12834	14	Draft spring follower plate	2.50
12835	15	Double sliding clevis	2.00
12836	16	Chain guide with attachment bolts	$0.75
12837	17	Uncoupling chain, per ft.	0.10
12838	18	Uncoupling hook with spring	1.50
13277	19	Uncoupling bracket with pin	1.00
12840	20	Uncoupling handle	0.30
13108	21	Pipe support	0.50
14965	22	⅞-in. repair link	0.06

Tomlinson M. C. B. Car Coupler

FORM 13

No.
14494—Complete M.C.B. Form 13 coupler equipment for single end with chain uncoupling, including coupler, draft gear, anchorage, unlocking chain with fittings, spring draw bar carrier, carrier slide bar and eight slide bar supports $130.00

14523—Complete M.C.B. Form 13 coupler equipment for single end with lever uncoupling including coupler, draft gear, anchorage, uncoupling device, spring draw bar carrier, carrier slide bar and eight slide bar supports $130.00



Piece 11, Draft Gear

Tomlinson M.C.B. Car Coupler—Form 13

Cat. No.	Part	Description	Charge
14495	1	Coupler body with knuckle springs	$30.00
10673	2	Standard split knuckle	9.00
11024	3	Solid knuckle	10.00
		Solid knuckle, 16 in.	12.25
14485	4	High knuckle, 16 in.	11.50
14236	5	Knuckle pin for standard knuckle	0.85
14486	6	Knuckle pin for high knuckle	0.90
14237	7	Knuckle spring	0.25
14497	8	Forged sliding lock	5.00
13884	9	Sliding lock pull rod	0.30
13885	10	Sliding lock spring	0.40
14498	11	Draft gear, complete	32.00
14499	12	Tailpiece	8.50

(Continued on Data Sheet No. 35)

Electric Railway Journal Maintenance Data Sheet

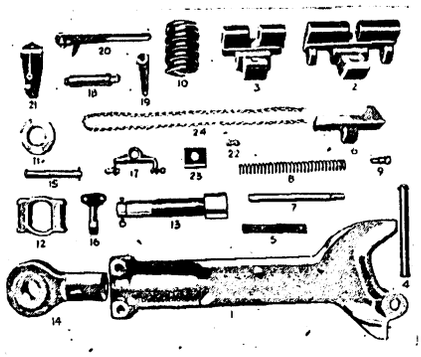
ROLLING STOCK—STANDARDS—36

C.E.R.M.M.A. Uniform Charges—(Continued from Data Sheet No. 35)

Tomlinson M.C.B. Coupler

Form 22—Repair Parts—(Continued)

Cat. No.	Part	Description	Charge
15207	1	Coupler body with knuckle springs, sliding lock spring seat and channel support	$52.50
15208	2	Standard 16-in. high split knuckle	15.00
15209	3	11½-in. high split knuckle	11.50
15210	4	Knuckle pin with ¾-in. cotter for 16-in. knuckle	1.00
14458	4	Knuckle pin with ¾-in. cotter for 11½-in. knuckle	1.00
14237	5	Knuckle spring	0.25
15211	6	Forged sliding lock	6.50
15212	7	Sliding lock guide rod	0.65
15213	8	Sliding lock spring	0.25
15214	9	Sliding lock clevis with pin and cotter	0.75
14674	10	Draft spring—6½x8-in. Harvey	6.00
14675	11	Draft gear follower	2.50
14501	12	Draft gear follower block	5.00



Cat. No.	Part	Description	Charge
15215	13	Draft gear bolt with ⅝-in. cotter	9.00
15216	14	Tailpiece	14.00
14471	15	Follower block pin with ½-in. cotter	0.50
15217	16	Pipe cleat	$0.65
15218	17	Chain guide with attachment bolts	1.00
15219	18	Spring barrel	4.25
15220	19	Center lever	0.65
14527	20	Side lever	1.60
14528	21	Side bracket	1.15
14529	23	Center bracket	0.30
14531	24	Uncoupling chain, per foot	0.10
14961	22	⅞-in. repair link	0.07

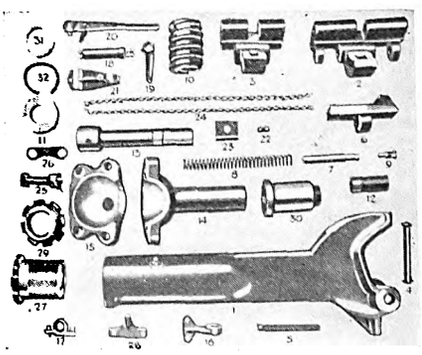
Tomlinson Form 23 M.C.B. Coupler

Repair Parts

No
15223— Complete M.C.B. Form 23 coupler equipment for single end, including coupler with draft gear, anchorage, uncoupling device, spring draw bar carrier and slide bar with supports $230.00

Cat. No.	Part	Description	Charge
15224	1	Coupler body with knuckle springs, draft gear bushing and channel support	$57.50
15208	2	Standard 16-in. high split knuckle	15.00
15209	3	11½-in. high split knuckle	11.50
15210	4	Knuckle pin with ¾-in. cotter for 16-in. knuckle	1.00
14458	4	Knuckle pin with ¾-in. cotter for 11½-in. knuckle	1.00

Cat. No.	Part	Description	Charge
14237	5	Knuckle spring	0.25
15211	6	Forged sliding lock	6.50
15225	7	Sliding lock guide rod	0.70
15226	12	Sliding lock guide tube	0.70
15213	8	Sliding lock guide spring	0.25
15214	9	Sliding lock guide clevis with pin and cotter	0.75
14674	10	Draft spring—6½x8-in. Harvey	6.00
14675	11	Draft gear follower	2.50
14670	14	Tail socket	20.00
15227	15	Tail socket cap	13.00
14672	25	Tail socket bolt with castle nut and cotter	1.00
14673	26	Tail socket shim	0.03
14676	13	Draft gear bolt	8.50
15228	27	Draft gear nut	8.50



14678	28	Draft gear nut lock	$0 45
15229	29	Draft gear packing nut	3.00
15230	30	Draft gear bushing	9.00
14680	31	Draft gear packing ring	0.70
14681	32	Draft gear packing	0.30
15217	16	Pipe cleat	0.65
15231	17	Chain guide with attachment bolts	0.70
15219	18	Spring barrel	4.25
15220	19	Center lever	0.65
14527	20	Side lever	1.60
14528	21	Side bracket	1.15
14529	23	Center bracket	0.30
14531	24	Uncoupling chain, per foot	0.10
14961	22	⅞-in. repair link	0.07

(Continued on Data Sheet No. 37)

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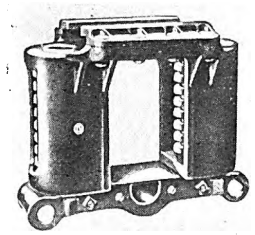
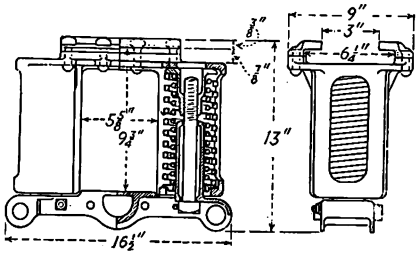
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—37

C.E.R.M.M.A. Uniform Charges—(Continued from Data Sheet No. 36)

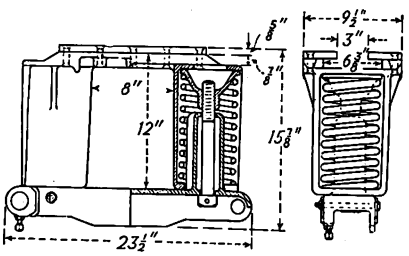
M.C.B. Spring Draw Bar Carrier
FORM 14

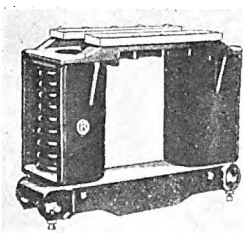




Cat. No.	Description	Charge
14429	Form 14 carrier for use with M.C.B. coupler	$18.00
14430	Body casting with jaws for Form 14 carrier	9.50
14431	Yoke casting for Form 14 carrier	3.50
13558	Outer coil spring for Form 14 carrier	1.00
14432	Inner coil spring for Form 14 carrier	0.75
14433	Jaws, front and rear, with rivets for carrier body, per pair	2.00

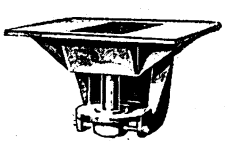
M.C.B. Spring Draw Bar Carrier
FORM 23

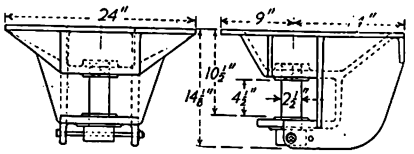




Cat. No.	Description	Charge
15233	Form 23 carrier complete	$34.00
15234	Body casting with jaws	17.00
15235	Yoke with clamping set screws and lock nuts	8.50
15236	Coil spring	0.85
15237	Jaw with rivets for carrier body, per pair	2.75
14781	Spring cap nut	1.25

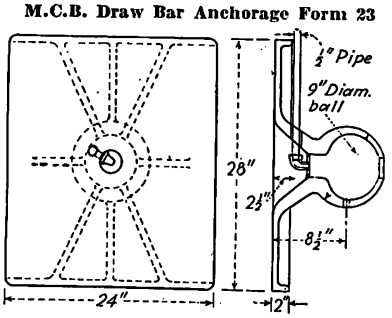
M.C.B. Draw Bar Anchorage Form 22





15221 Form 22 anchorage complete..... $42.00
15222 Anchorage pin.....

M.C.B. Draw Bar Anchorage Form 23



15232 Form 23 Anchorage complete..... $37.50

Cat. No.		Charge
100034	Carrier, slide bar	$12.00
14362	Form 1, slide bar support	1.00
13219	Form 2, slide bar support	.35
13220	Form 3, slide bar support	.20

F. o. b. Mansfield, Ohio

(Continued on Data Sheet No. 38)

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—39

C.E.R.M.M.A. Uniform Charges—(Concluded from Data Sheet No. 38)

Soaked wool waste for repacking journal	4¼x8	1.00
Soaked wool waste for repacking journal	3¾x7	1.00
All old waste to be removed and discarded and box thoroughly cleaned		
Journal wedges	A.R.A. 5x9, drop forged	0.75
Brake shoes	Reinf. steel back, flanged for A.E.R.A. 33-in. wheel	1.00
Brake shoe keys	Print 1413208	0.15

	Each
No. 2 beams complete (truss type) as shown print B-1402	$5.14
Brake heads (each)	1.00
Brake beam struts (each)	1.00
Channel	0.95
Rods (each)	0.95
Nuts (each)	0.12

Item	Description or Print	Charge Each
Springs	A.R.A. Std. class C, with spring plates	$6.30
Single bolster coil spring		1.00

F.o.b. destination in base territory.
Charges are per piece, not per truck, and pieces are shown as per car set, not per truck.

APPENDIX (E)
Car Body

86 No credit to be allowed for scrap lumber when renewing doors, floors, or other parts constructed in whole or in part of work.
95 Altering height of car body to keep couplers at proper height to be charged at cost.
106 Any car requiring general repairs due to owners defects on which the estimated cost of repairs exceeds $150 shall be inspected by the handling line and a careful estimate made of the cost of necessary repairs and forwarded to car owner, who will then inspect the car if he so desires, shall within thirty (30) days authorize repairs or further disposition of the car, shipping to handling line such material as he may see fit for use in repairing car. In case repairs are to be made by handling line.
107 In no case shall the total charge for actual repairs exceed the estimate by more than $50.00 unless authorized.
108 If the owner authorizes destruction of car, handling line shall allow credit for all material at scrap prices less labor required for destruction

	Each
Solid "I" type brake beams complete	$4.75
(Brake head $1.00 each)	
(Beam struts 1.00 each)	

Prices F.O.B. destination, base territory.

Ohio Brass Company
Coupler carrier slide car.

Catalog No.		Each
10034	Coupler carrier slide bar (for couplers Nos. 12, 13, 22 and 23)	$12.00
14362	Form No. 1 slide bar support	1.00
13219	Form No. 2 slide bar support	0.35
13220	Form No. 3 slide bar support	0.20

Prices F.O.B. factory, Mansfield, Ohio.

American Car & Foundry Company
Center plate and side bearings for freight cars. Std. C.E.R.A. type.

	Each
Body center plate (U. S. R. A. Std.)	$3.95
Body side bearing complete with stiffener and bolts	10.12
Body side bearing plate (curved)	4.72

Prices F.O.B. factory, Jeffersonville, Ind.

Camel Company
Fixtures for C.E.R.A. standard freight cars Drawing No. 3870-C

	Per Foot
2 Camel No. 27 tracks 21 ft. 8 in.	$0.33
2 Camel stiffener angles, 1½x1½x⅜x4 ft. 7¾ in. upper	.11
2 Camel stiffener angles, 1½x1½x⅜x6-ft. 4½-in. upper	.11
2 Camel stiffener angles, 1½x1½x⅜x4-ft. 7½-in. center	.11
2 Camel stiffener angles, 1½x1½x⅜x6-ft. 4½-in. center	.11
2 Camel bottom Z bars, 2½x1½x2½x⅜x4-ft. 7½-in.	.21
2 Camel bottom Z bars, 2½x1½x2½x⅜x6-ft. 4½-in.	.21
2 Camel inside angle tracks, 2x2x⅜x4-ft. 5-in.	.15
2 Camel lock fastening straps, 1½x½x2-ft. 3¾-in.	.23
2 Camel hasp fastening straps, 1½x½x2-ft. 5¼-in.	.23
10 Camel bottom Z-bar washer plates, 1½x⅜x6½	.09
8 Camel CM-2078 hangers and rollers complete	0.52
8 Camel M-54 guides (bottom)	0.39
4 Camel M-61 guides complete with A-38 keepers	0.52
4 Camel "D" stops (back)	0.22
4 Camel D-18 stops	0.28
2 Camel F-17-L locks complete with pin F-16	0.57
2 Camel DF-40 hasps	0.13
2 Camel DF-41 hasp fasteners	0.16
2 Camel K-32 post caps	0.95
2 Camel K-199 post seats	1.50
2 Camel K-52 upper locks complete with push rod 28 in. hood bolts 5½ in., nuts and washers	0.94
2 Camel K-143 upper stops	0.63
2 Camel K-117 lower stops	1.30
2 Camel DF-30 lower stop pins	0.19
2 Camel K-145 inside hangers	0.63
2 Camel J-30 buffers	0.50
2 Camel J-28 closers	0.45
2 Camel J-7 fulcrums	0.11
2 Camel USS-2006 levers	0.28

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—38

C.E.R.M.M.A. Uniform Charges—(Continued from Data Sheet No. 37)

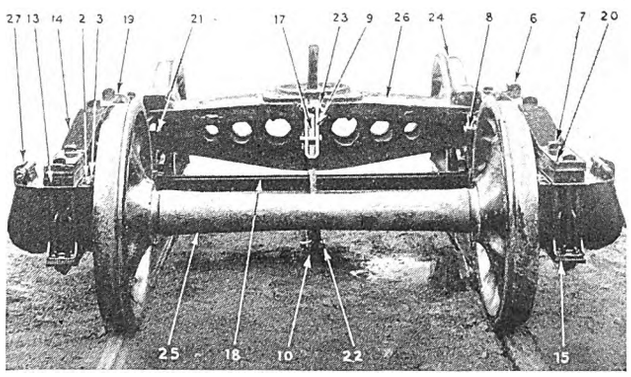
EXHIBIT (D)

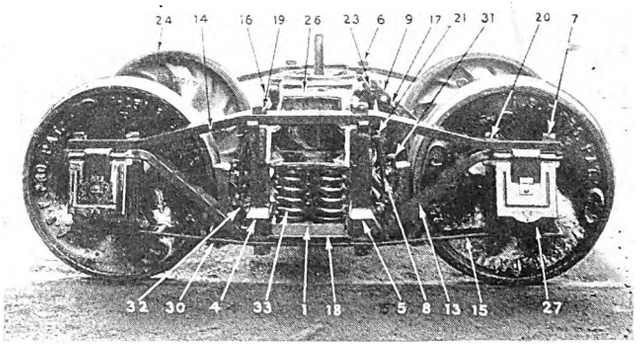
Buffalo Brake Beam Company, Buffalo, N. Y.

C.E.R. M.M.A. Standard Truck Parts

No.	Item	Description or Print	Charge Each
1	Spring shims.....	Oak. 1¾ x 11⅝ x 1 ft. 0 in.....	$0.61
2	Dust guards.....	Print 1415577....	0.25
3	Dust guard wedges	Cottonw. 1 3/16x1⅜x 0 ft. 9⅞-in.....	0.13
4	Columns—R.H....	Print 5415305....	6.36
5	Columns—L.H....		
6	Column bolts.....	1⅝x22¾ with nut..	0.68
7	Journal box bolt...	1⅛x16⅝ with nut..	0.29
8	Brake beam hanger	Print 1415352....	1.07
9	Lever guides.....	Print 1415351....	0.80
10	Bottom connections	Print 1415358....	2.96
11	Bottom arch bar guides.....	Print 1415356....	0.32
12	Brake beam safety	Print 1415353....	0.51
13	Bottom arch bars.	Print 1415355....	7.98
14	Top arch bars.....	Print 1415355....	6.78
15	Tie bars.....	Print 1415355....	2.16
16	Live levers.....	Print 1415349....	1.67
17	Dead levers.....	Print 1415349....	1.71
18	Spring planks.....	Print 1415354....	8.23
19	Column bolt lock washers.....	Print 141› 62....	0.03
20	Journal box bolt lk. washer.....	Print 1415363....	0.03
21	Brake beam hgr. pin L-6.....	.....	0.26
22	Brake pins L-2¾...	Print 1415357....	0.20
23	Brake pins L-2¼...		0.21
	No rivets, nuts, bolts, cotters, etc.		
24	Wheels 33 in. 3½ in. tread, Rolled Steel or Davis.....		*37.50 †17.75
25	Axles.....	A. R. A. 5x9-in. rough turned.	*32.50 †18.00
26	Bolsters.....	40-ton cast steel with integral ctr. plt. comp. with dead lever stop brkt. riveted on, per Gould Coupler Co's Pr. BO 4195-B.....	$68.58
27	Journal boxes.....	A.R.A. 5x9 mall. comp. with pressed steel top, hinge lid, for arch bar trk.....	8.24
	Journal box lids complete, 5 in.x9.....		1.60
	Journal box lids complete 4¼x8.....		1.50
	Journal bearings....	A.R.A. 5x9, lead lined.....	3.50
	Journa bearings..	A.R.A. 4¼x8, lead lined.....	2.30
	Journal bearings..	A.R.A. 3¾x7, lead lined.....	1.75
	Soaked woo waste	for repacking 5x9 journal.....	1.25

*New. †Second hand.



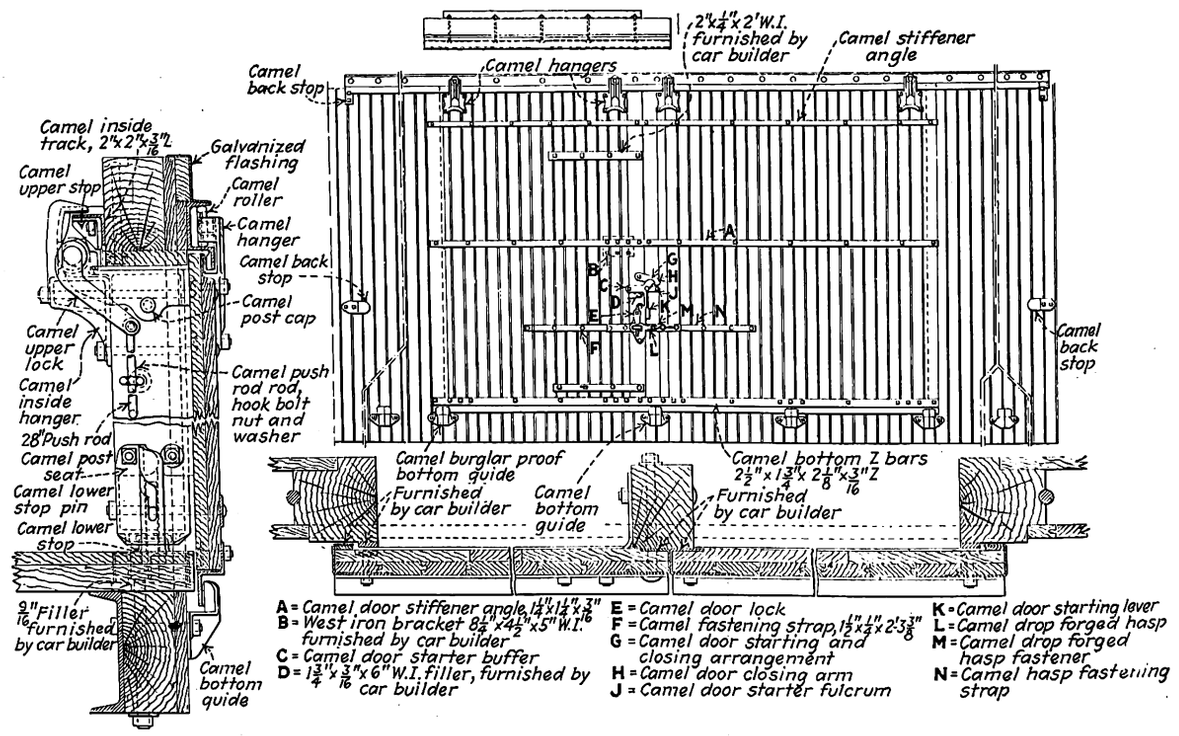


(Continued on Data Sheet No. 39)

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—STANDARDS—40

Camel Door Fixtures Used on Standard Car



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American Association News

A.E.R.A. Announces Program for 47th Convention

First sessions will be held Monday, Sept. 24, while doors will open for exhibit on preceding Saturday morning. Tuesday will be reserved as exhibit day this year

CONTINUING the plan inaugurated at the Cleveland convention last year, the doors will be opened on the exhibit for the 47th convention of the American Electric Railway Association at 9 a.m., Saturday, Sept. 22. An open meeting of the American Association executive committee will be held the same morning. At this meeting committee reports on such important topics as economics of street traffic, rapid transit, industrial relations and motor vehicle information will be presented. All delegates are invited to attend.

No formal activities are planned for Sunday. In the morning there will be a golf tournament open to all members of the A.E.R.A. It will be played at the Hawthorne Valley Country Club.

As usual, the regular sessions of the American Association will be held in the mornings, while those of the affiliated associations will be held in the afternoons. Tuesday instead of Wednesday will be set aside as Exhibit Day, and no formal sessions will be held during the day. There will be a meeting under the auspices of the Advisory Council in the evening, and informal luncheons will be held at which specific topics will be discussed.

Following is the complete program corrected to Sept. 1, as announced by the general secretary, J. W. Welsh:

American Association

Monday, Sept. 24, 10 a.m.

Auditorium Ball Room, Third Floor

R. P. STEVENS, Chairman

General Subject—*Economics*

Welcome, by Hon. W. R. Hopkins, City Manager, Cleveland, Ohio.

Address of the President—R. P. Stevens, president Allied Power & Light Corporation, New York, N. Y.

Routine.

"The Economics of and Need for Public Participation in City Transportation," by Henry I. Harriman, chairman Metropolitan Planning Board of Massachusetts, Boston, Mass.

"Regulation of Transportation—Its Aims and Trend," by Lewis E. Gettle, chairman Railroad Commission of Wisconsin, Madison, Wis.

"Problems of Urban Transportation Rates," by William M. Wherry, Jr., Wherry & Wight, New York, N. Y.

Round Table Luncheon Conferences

CLEVELAND HOTEL, 1 P.M.

No. 1—"Safety," J. P. Barnes, sponsor.
No. 2—"Fares," C. D. Emmons, sponsor.
No. 3—"Taxation," W. A. Jackson, sponsor.
No. 4—"Manufactures," E. F. Wickwire, sponsor.

Tuesday, Sept. 25, 10 a.m.

Exhibit Day

Round Table Luncheon Conferences

STATLER HOTEL, 1 P.M.

No. 5—"Interurbans," D. W. Snyder, Jr., sponsor.
No. 6—"Traffic," E. J. McIlraith, sponsor.
No. 7—"Education," Edward Dana, sponsor.
No. 8—"Merchandising," Barron Collier, sponsor.

Tuesday, Sept. 25, 8:30 p.m.

Auditorium Ball Room, Arena Floor

B. C. COBB, Chairman

Selections by B. A. Rolfe's orchestra.

Address of the chairman—B. C. Cobb, chairman of the board, Allied Power & Light Corporation, New York, N. Y.

Presentation of Charles A. Coffin Award by President R. P. Stevens.

Miss Phoebe Crosbie, soloist.

Address—Owen D. Young, chairman of the board, General Electric Company, New York, N. Y.

Selection by B. A. Rolfe's orchestra.

Miss Phoebe Crosbie, soloist.

Informal dancing; music by B. A. Rolfe's orchestra.

Wednesday, Sept. 26, 10 a.m.

Auditorium Ball Room, Third Floor

R. P. STEVENS, Chairman

General Subject—*Modernization*

Report—Managing Director Lucius S. Storrs, American Electric Railway Association, New York, N. Y.

Report—Committee on Nominations—Britton I. Budd, chairman, president Chicago Rapid Transit Company and Chicago, North Shore & Milwaukee Railroad, Chicago, Ill.

Election of officers.

"What Are the Financial Results, Achievements and Future Needs of Modernization," by H. G. Bradlee, vice-president Stone & Webster, Inc., Boston, Mass.

"How Can Modernization Be Justified from Its Financial Results so that Additional Capital Can Be Secured for This Purpose?" by Alonzo R. Williams, first vice-president and general manager United Electric Railways, Providence, R. I.

"Opportunities of Modernization and Economies that Can Be Effected by Mass Production Methods," by W. T. Rossell, general manager Pittsburgh Railways, Pittsburgh, Pa.

"Applying Modern Merchandising and Sales Methods to Transportation," by Charles Gordon, editor ELECTRIC RAILWAY JOURNAL, New York, N. Y.

"Prosperity and the Automotive Industry," by C. F. Kettering, vice-president General Motors Corporation, Detroit, Mich.

Round Table Luncheon Conferences

HOLLENDEN HOTEL, 1 P.M.

No. 9—"Car Financing," Charles Gordon, sponsor.
No. 10—"Public Relations," W. E. Wood, sponsor.
No. 11—"New Cars," J. R. Blackhall, sponsor.
No. 12—"Small City's Problem of Transportation," Harold L. Geisse, sponsor.

Thursday, Sept. 27, 10 a.m.

Auditorium Ball Room, Third Floor

R. P. STEVENS, Chairman

General Subject—*Viewpoint of Others on Our Industry*

Award—*Electric Traction* Speed Contest—T. Fitzgerald, chairman, vice-president Pittsburgh Railways, Pittsburgh, Pa.

"Service and Business," by E. H. Sniffin, assistant to vice-president Westinghouse Electric & Manufacturing Company, New York, N. Y.

"The Street Railway Industry, Present and Future—Opportunities of Improving Qualities of Service," by P. S. Arkwright, president National Electric Light Association and president Georgia Power Company, Atlanta, Ga.

Big Demand for

Luncheon Tickets

WITH the sale of 300 tickets for the conference luncheons to be held during the Cleveland Convention 50 per cent of the space is gone. Leslie Vickers, economist of the American Electric Railway Association, who is in charge of arrangements for the luncheons, requests that orders be sent to him as early as possible to avoid disappointment. Address him at A.E.R.A. headquarters, 292 Madison Avenue, New York City.

Act Now!

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"Transportation from the Viewpoint of the City Newspaper," by N. D. Cochran, editor-in-chief *Scripps-Howard News*, New York, N. Y.

"National Aspects of the Association's Activities," by W. H. Sawyer, president Stevens & Wood, Inc., New York, N. Y.

"Some Phases of the Electric Railway Situation from the Manufacturers' Viewpoint," by E. F. Wickwire, vice-president Ohio Brass Company, Mansfield, Ohio.

Installation of officers.

Adjournment.

Round Table Luncheon Conferences

CLEVELAND HOTEL, 1 P.M.

No. 13—"Freight," L. M. Brown, sponsor.

No. 14—"Management," R. F. Carbutt, sponsor.

No. 15—"Motor Bus," A. M. Hill, sponsor.

Friday, Sept. 28, 9-12 a.m.

Inspection of Manufacturers' Exhibits.

Accountants' Association

Monday, Sept. 24, 2:30 p.m.

Room A—Third Floor

O. H. BERND, Chairman

Address of Acting President.

Report of Executive Committee.

Report of Secretary-Treasurer.

Report — Committee Representing the Accountants' Association at the Annual Convention of the National Association of Railroad and Utilities Commissioners, W. L. Davis, chairman, auditor Lehigh Valley Transit Company, Allentown, Pa.

Discussion.

Report—Committee on Standard Classification of Accounts, M. W. Glover, chairman, general auditor West Penn Railways Company, Pittsburgh, Pa.

Discussion.

Report—Sub-committee on Bus Accounting, E. A. Tuson, chairman, general auditor Public Service Co-ordinated Transport, Newark, N. J.

Discussion.

"Accounting in Steel Works," by Walter C. Bird, assistant to the auditor American Steel & Wire Company, Cleveland, Ohio.

Discussion.

Tuesday, Sept. 25, 10 a.m.

Exhibit Day

Accountants' "Get-Together Luncheon" at the Cleveland Athletic Club. This is to be an informal gathering of accountants and railway men interested in accounting subjects for the purpose of becoming better acquainted.

Wednesday, Sept. 26, 2:30 p.m.

Room A—Third Floor

Joint Session—Accountants' Association and Purchases and Stores Division

O. H. BERND and JOHN Y. BAYLISS, Chairmen

Report—Standing Committee on Purchases and Stores, John Y. Bayliss, chairman, director of purchases and supplies Virginia Electric & Power Company, Richmond, Va., and Committee on Stores Accounting, R. A. Weston, chairman, special accountant the Connecticut Company, New Haven, Conn.

General Discussion.

"Pricing Problems," by R. A. Weston, special accountant the Connecticut Company, New Haven, Conn.

Discussion—Led by A. A. Ordway.

Reports—Special Committees:

No. 1—Engineering Manual, by J. Fleming, chairman.

No. 2—Unit Piling and Standard Packages, by W. E. Scott, chairman.

No. 3—Investment in Material and Supplies and the Cost of Operating Stores, by C. A. Harris, chairman.

No. 4—Price Records and Pricing Materials and Supplies, by A. A. Ordway, chairman.

General Discussion.

This concludes the joint session, which will be followed immediately by a short business session of the Accountants' Association as follows:

Report—Committee on Nominations, by T. P. Kilfoyle, chairman, auditor Cleveland Railway, Cleveland, Ohio.

Election of Officers.

Thursday, Sept. 27, 2:30 p.m.

Room A—Third Floor

O. H. BERND, Chairman

"Auditing Control in Manufacturing Industry," by F. H. Corregan, assistant general auditor General Electric Company, Schenectady, N. Y.

Discussion.

Report—Committee on Fare Collections, by E. A. Tuson, chairman, general auditor Public Service Co-ordinated Transport, Newark, N. J.

Discussion.

Report—Committee on Freight Accounting, by Walter Shroyer, chairman, treasurer for receiver Union Traction Company of Indiana, Anderson, Ind.

Discussion.

Report—Committee to Review Accountants' Proceedings, by J. E. Heberle, chairman, assistant to the president Capital Traction Company, Washington, D. C.

Discussion.

Report—Committee on Resolutions, by J. E. Heberle, chairman, assistant to the president Capital Traction Company, Washington, D. C.

Installation of Officers.

Informal Round Table of Accounting Matters.

Claims Association

Monday, Sept. 24, 2:30 p.m.

Room C—Second Floor

J. S. KUBU, Chairman

Address of the President.

Report of the Executive Committee.

Report of Secretary-Treasurer.

"Selections of Claims Department Employees," by John J. K. Caskie, general attorney Philadelphia Rapid Transit Company, Philadelphia, Pa.

Formal Discussion by:

H. V. Drown, general claim agent Public Service Co-ordinated Transport, Newark, N. J.

Seth W. Baldwin, attorney the Connecticut Company, New Haven, Conn.

General Discussion.

"Ambulance Chasing in New York City and State, as Disclosed by Investigation." Address by speaker familiar with this interesting situation.

Tuesday, Sept. 25, 10 a.m.

Exhibit Day

Inspection of the Cleveland Railway Claims Department System—3-6 p.m.

Wednesday, Sept. 26, 12:30 p.m.

Luncheon Meeting—Hollenden Hotel.

J. S. KUBU, Chairman

"Public Reaction to Operation by Public Authority as it Affects Claims," by L. H. Butterworth, claims attorney Boston Elevated Railway, Boston, Mass.

Discussion.

"Co-operation with Police Department as to Traffic Regulation," by W. F. Weh, superintendent accident department Cleveland Railway Company, Cleveland, Ohio.

Discussion.

The remainder of the meeting to be devoted to an exchange of specific claims experiences.

Thursday, Sept. 27, 2:30 p.m.

Room C—Second Floor

J. S. KUBU, Chairman

"Effect Upon Accidents of Automatic Traffic Control Installation and Parking Restrictions," by G. T. Hellmuth, general claims attorney Chicago, North Shore & Milwaukee Railroad Company, Chicago, Ill.

Discussion.

Report—Committee on Safety. H. K. Bennett, chairman, safety engineer, Providence, R. I.

Formal Discussion by:

H. V. Drown, general claim agent Public Service Co-ordinated Transport, Newark, N. J.

J. H. Handlon, claim agent Market Street Railway Company, San Francisco, Cal.

Wallace Muir, general counsel Kentucky Traction & Terminal Company, Lexington, Ky.

CONVENTION REPORT NUMBER

September 29

Returning from Cleveland you will find on your desk this number, with a full report of the proceedings.

Your Permanent Record of the Big Event

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W. E. Foley, general claim agent Third Avenue Railway System, New York, N. Y.
"Methods of Claim Department Operation in Toronto," by Irving S. Fairty, K. C., general counsel Toronto Transportation Commission, Toronto, Canada.
Discussion.

Report—Committee on Nominations, by Wallace Muir, chairman, general counsel Kentucky Traction & Terminal Company, Lexington, Ky.
Election of Officers.
Installation of Officers.
Presentation of Past-President's Badge.

Engineering Association

POWER DIVISION

Monday, Sept. 24, 2:30 p.m.

Room P—Second Floor

W. E. BRYAN, Chairman

Report—Standing Committee on Power, by W. E. Bryan, chairman, superintendent of power St. Louis Public Service Company, St. Louis, Mo.
General Discussion.
Reports—Special Committees:
No. 2—Mercury Vapor Power Rectifiers —H. W. Codding.
No. 3—Power Contracts—John L. Ross, chairman.
No. 4—Switchboard Equipment—C. E. Bennett.
Address — R. H. Dalgleish, president American Electric Railway Engineering Association.
Reports—Special Committees:
No. 6—Trolley Wire Wear, by H. S. Murphy, chairman.
No. 7—Radio Interference, by W. J. Quinn, chairman.
No. 10—Lightning Protection, by C. E. Bennett, chairman.
No. 11 — Overhead vs. Underground Feeders, by J. Leisenring, chairman.
No. 13—Trolley Voltage in Congested Districts, by A. J. Klatte, chairman.
General Discussion.

Tuesday, Sept. 25, 10 a.m.

Exhibit Day

Wednesday, Sept. 26, 2:30 p.m.

Room P—Second Floor

W. E. BRYAN, Chairman

Reports—Special Committees:
No. 1—Engineering Manual, by J. Walter Allen, chairman.
No. 5 — Catenary Specifications, by Dwight L. Smith, chairman.
No. 8—Standardization of Trolley Wire Reels, by J. F. Neild, chairman.
No. 9—Conduit Specifications, by A. J. Klatte, chairman.
No. 12—Ferrous vs. Non-Ferrous Materials for Overhead, by H. S. Murphy, chairman.
General Discussion.
"Automatic Substation Installations in Cincinnati," by Harley L. Swift, superintendent of substations Cincinnati Street Railway, Cincinnati, Ohio.
Discussion.
"Power Saving Effects of Resistance Heating and Dynamic Braking Heating," by A. W. Baumgarten, division engineer Chicago & Joliet Electric Railway, Joliet.
Discussion.
"Inspection vs. Repairs," by Dwight L. Smith, electrical engineer Chicago Rapid Transit Company, Chicago, Ill.
Discussion.

PURCHASES AND STORES DIVISION

Monday, Sept. 24, 2:30 p.m.

Room S—Mezzanine Floor

JOHN Y. BAYLISS, Chairman

Address—R. H. Dalgleish, president American Electric Railway Engineering Association.
"Standard Packages," by W. E. Scott, superintendent of supplies Philadelphia Rapid Transit Company, Philadelphia, Pa.
Discussion—Led by W. J. Walker.
"Inactive Stock," by A. S. Duncan, assistant director of finished stocks Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.
Discussion—Led by A. E. Hatton.
"Relation of Purchaser to the Stores Department," by A. L. Fischer, purchasing agent Cincinnati Street Railway, Cincinnati, Ohio.
Discussion—Led by F. A. Jordan.
"Handling Supplies for Buses," by W. S. Stackpole, general storekeeper Public Service Co-ordinated Transport, Newark, N. J.
Discussion.

Tuesday, Sept. 25, 10 a.m.

Exhibit Day

Luncheon Meeting

HOLLENDEN HOTEL, 1 P.M.

An informal luncheon of purchasing agents and storekeepers at which arrangements have been made for the following interesting program:
"What Would Be a Fair Measure of the Cost of Handling Materials and Supplies," by C. A. Harris, chief of stores Philadelphia Company and Affiliated Corporations, Pittsburgh, Pa.
General Discussion.

Wednesday, Sept. 26, 2:30 p.m.

Room A—Third Floor

Joint Session—Purchases and Stores Division and Accountants' Association

JOHN Y. BAYLISS and O. H. BERND, Chairmen

Report—Standing Committee on Purchases and Stores and Committee on Stores Accounting:
John Y. Bayliss, chairman, director of purchases and supplies Virginia Electric & Power Company, Richmond, Va.
R. A. Weston, chairman, special accountant the Connecticut Company, New Haven, Conn.
General Discussion.
"Pricing Problems," by R. A. Weston, special accountant the Connecticut Company, New Haven, Conn.
Discussion—Led by A. A. Ordway.
Reports—Special Committees:
No. 1—Engineering Manual, by J. Fleming, chairman.
No. 2—Unit Piling and Standard Packages, by W. E. Scott, chairman.
No. 3—Investment in Material and Supplies and the Cost of Operating Stores, by C. A. Harris, chairman.
No. 4—Price Records and Pricing Materials and Supplies, by A. A. Ordway, chairman.
General Discussion.
This concludes the joint session, which will be followed immediately by a short business session of the Accountants' Association as follows:
Report — Committee on Nominations, T. P. Kilfoyle, chairman, auditor Cleveland Railway, Cleveland, Ohio.
Election of Officers.

ROLLING STOCK DIVISION

Monday, Sept. 24, 2:30 p.m.

Room R—Lower Floor Exhibition Hall

A. T. CLARK, Chairman

Report—Standing Committee on Rolling Stock, by A. T. Clark, chairman, superintendent of rolling stock and shops the United Railways & Electric Company, Baltimore, Md.
General Discussion.
Reports—Special Committees:
No. 1—Engineering Manual, by W. C. Bolt, chairman.
No. 2—Motor Coaches, by V. W. Berry, chairman.
Address—R. H. Dalgleish, president American Electric Railway Engineering Association.
Reports—Special Committees:
No. 3—Car Design, by H. H. Adams, chairman.
No. 4—Lighting, by R. W. Cost, chairman.
No. 5—Bearings, by W. C. Bolt, chairman.
No. 6—Lubrication, by J. H. Lucas, chairman.
No. 7—Automatic Coupler Specifications, by P. V. C. See, chairman.
No. 8—Motor Brushes, by R. A. Hutchins, chairman.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Sept. 7*—Maryland Utilities Association, mid-year meeting, Braddock Hotel, Braddock Heights, Md.**

***Sept. 7-8*—Central Electric Traffic Association, Potawatomi Inn, Angola, Ind.**

SEPT. 22-28, 1928
American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

***Sept. 25*—Central Electric Railway Master Mechanics' Association, Cleveland, Ohio.**

***Oct. 1-5*—National Safety Council, safety congress, New York, N. Y.**

***Oct. 8-12*—American Welding Society, fall meeting, Philadelphia, Pa.**

***Oct. 24-25*—Public Utilities Association of West Virginia, annual meeting, Huntington, W. Va.**

***Nov. 7-8*—Iowa Electric Railway Association, operating meeting, Roosevelt Hotel, Cedar Rapids, Iowa.**

***Nov. 21-22*—Public Utilities Association of Virginia, Hotel Roanoke, Roanoke, Va.**

***Jan. 23-25, 1929*—Electric Railway Association of Equipment Men, Southern Properties, Houston, Tex.**

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No. 9—Noise Reduction, by H. S. Williams, chairman.
No. 10—Welding Wheel Flanges, by J. S. McWhirter, chairman.
No. 11—Overhead Current Collecting Devices, by Hugh Savage, chairman.
No. 13—Limits of Wear, by W. T. Vivian, chairman.
General Discussion.
Report—Committee on Heavy Electric Traction, by H. F. Brown, chairman, assistant electrical engineer New York, New Haven & Hartford Railroad, New Haven, Conn.
General Discussion.

Tuesday, Sept. 25, 10 a.m.

Exhibit Day

Wednesday, Sept. 26, 2:30 p.m.

Room R—Lower Floor Exhibition Hall

A. T. CLARK, Chairman

"Lubrication," by W. B. D. Penniman, consulting chemist Penniman & Browne, Baltimore, Md.
Formal Discussion by H. H. Adams, John Lindall, J. S. McWhirter, Dr. R. Haskell, R. A. Wotowitch.
General Discussion.
"Future Rolling Stock," by Charles Gordon, editor ELECTRIC RAILWAY JOURNAL, New York, N. Y.
Formal Discussion by L. J. De Lamarter, G. L. Kippenberger, J. A. Brooks, A. L. Kasemeier.
General Discussion.

WAY AND STRUCTURES DIVISION

Monday, Sept. 24, 2:30 p.m.

Room W—Lower Floor Exhibition Hall

H. H. GEORGE, Chairman

Report—Standing Committee on Way and Structures, by H. H. George, chairman, superintendent of research Cleveland Railway Company, Cleveland, Ohio.
General Discussion.
Report—Special Committee.
No. 4—Track Ballast and Drainage, by S. Clay Baker, chairman.
Address — R. H. Dalgleish, president American Electric Railway Engineering Association.
Reports—Special Committees:
No. 6—Arc Welding, by C. F. Gailor, chairman.
No. 7—Alloy Steels for Special Trackwork, by A. T. Spencer, chairman.
No. 8—Track Pavement, by A. E. Harvey, chairman.
No. 9—Bus Garage Design, by Adrian Hughes, Jr., chairman.
No. 11—Track Construction Specifications, by C. L. Hawkins, chairman.
No. 12—Rail Corrugation, by W. W. Wysor, chairman.
No. 13—Joint Railway and Bus Terminals, by E. D. Eckroad, chairman.
No. 15—Track Checking Gage, by C. H. Clark, chairman.
No. 16—Special Trackwork Foundations, by L. A. Mitchell, chairman.
General Discussion.

Tuesday, Sept. 25, 10 a.m.

Exhibit Day

Wednesday, Sept. 26, 2:30 p.m.

Room W—Lower Floor Exhibition Hall

H. H. GEORGE, Chairman

Reports—Special Committees:
No. 1—Engineering Manual, by W. R. Dunham, Jr., chairman.
No. 2—Special Trackwork, by E. M. T. Ryder, chairman.
No. 5—Wood preservation, by C. A. Smith, chairman.
No. 14—Rail markings, by C. A. Alden, chairman.
General Discussion.
"Recent Developments in Arc Welding of Rail Joints," by H. C. Heaton, superintendent of tracks United Electric Railways, Providence, R. I.
Discussion.
"Bus Garage Design," by H. M. Steward, superintendent of maintenance Boston Elevated Railway, Boston, Mass.
Discussion.
"The Bolted Joint in Paved Track," by B. P. Legaré, engineer maintenance of way and construction Market Street Railway, San Francisco, Cal.
Discussion.
"Methods Used in Speeding Up the Track Construction Program," by Oscar Williams, superintendent of way and structures Pittsburgh Railways, Pittsburgh, Pa.
Discussion.
"What is Being Done to Reduce Noise in Special Trackwork Layout," by P. B. Harris, chief engineer Los Angeles Railway, Los Angeles, Cal.
Discussion.

General Meeting of Engineering Divisions

Thursday, Sept. 27, 2:30 p.m.

Room W—Lower Floor Exhibition Hall

R. H. DALGLEISH, Chairman

Address of the President.
Report of the Executive Committee.
Report of the Secretary-Treasurer.
Report—Committee on Constitution and By-Laws, by W. W. Wysor, chairman, chief engineer United Railways & Electric Company, Baltimore, Md.
Report—Committee on Nominations, by Daniel Durie, chairman, general manager Pennsylvania Division West Penn Railways, Connellsville, Pa.
Election of Officers.
"Economies to Be Effected by the Use of Labor Saving Machinery," by W. T. Rossell, general manager Pittsburgh Railways, Pittsburgh, Pa.
Discussion.
Installation of Officers.
Presentation of Past-President's Badge.

Transportation and Traffic Association

Monday, Sept. 24, 2:30 p.m.
Room T—Second Floor

EDWARD DANA, Chairman

Address of the President.
Report of the Executive Committee.
Report of the Secretary-Treasurer.
Report—Committee on Nominations, by J. V. Sullivan, chairman; assistant to vice-president Chicago Surface Lines, Chicago, Ill.
Election of Officers.
Report — Committee on Traffic and Safety, by R. W. Emerson, chairman, vice-president and general manager Cleveland Railway, Cleveland, Ohio.
"What Can Electric Railways Do About the Traffic Problem," by E. J. McIlraith, staff engineer Chicago Surface Lines, Chicago, Ill.
"Parking," by F. H. Caley, secretary Cleveland Automobile Club, Cleveland, Ohio.
"The Effect of Passenger Automobiles on Mass Transportation Traffic," by R. F. Kelker, Jr., consulting engineer, Kelker, De Leuw & Company, Chicago, Ill.
Formal Discussion.
General Discussion.

Tuesday, Sept. 25, 10 a.m.
Exhibit Day

Wednesday, Sept. 26, 2:30 p.m.

Room T—Second Floor

EDWARD DANA, Chairman

Report—Committee on Service Betterment, by W. E. Wood, chairman, president Virginia Electric & Power Company, Richmond, Va.
Address.
Formal Discussion.
General Discussion.
Playlet—"Orders Is Orders," two scene demonstration of reinstructional work with present transportation employees under auspices of committee on education.

Thursday, Sept. 27, 2:30 p.m.
Room T—Second Floor

EDWARD DANA, Chairman

Report—Committee on Bus Operation, by Adrian Hughes, Jr., chairman, superintendent of bus transportation United Railways & Electric Company, Baltimore, Md.
"Relations Between Manufacturer and Purchaser After the Purchase," by Charles H. Wondries, manager of the commercial division Studebaker Corporation of America, South Bend, Ind.
Formal Discussion.
General Discussion.
Installation of Officers.
Presentation of Past-President's Badge.

Central Master Mechanics to Meet in Cleveland

SEPT. 25, beginning at 9 a.m., Eastern Standard time, the Central Electric Railway Master Mechanics' Association will hold its next regular meeting at the Auditorium, Cleveland, Ohio. This meeting will be held in meeting room "R" located in the basement of the Auditorium, this being the room assigned to the rolling stock group of the American Electric Railway Engineering Association on Monday and Wednesday afternoon.

A short program is being arranged for this meeting, but the greater part of the time will be devoted to discussion of specific subjects to be furnished by the program committee and the discussion of individual problems of members in attendance.

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News *of the* Industry

Philadelphia Agreement Reached

Operation of Broad Street subway to begin under temporary plan. Ford, Bacon & Davis among city's consultants

AN ORDINANCE embodying the agreement between the city and the Philadelphia Rapid Transit Company for three months' operation of the Broad Street subway was introduced in City Council on Aug. 23 and referred to the Transportation Committee. It will be reported back to the chamber with a favorable recommendation at a special session of Council. The Public Service Commission will then be asked to ratify the agreement immediately so that the tube can be placed in operation on Sept.1,

The agreement provides for operation between Grange Avenue and City Hall. The present rate of 7½ cents, same as now in effect throughout the P.R.T. system, will be maintained. The railway will retain the gross receipts from all sources of the line and will pay all operating expenses. In addition, the P.R.T. agrees to pay the city $200,000 a month as rental for the tube, a sum which amounts to one-half of the carrying charges on the bonds issued by the city for the construction of the subway. Upon the expiration of the three months' lease, the P.R.T. will continue operation on a day-to-day basis on the same terms, with privilege provided for either city or company to terminate the contract upon 24 hours notice.

Throughout, the experimental period of operation the company will establish and maintain a uniform system of accounts, which will be checked by the auditors engaged by the Mackey Administration under the supervision of the Department of City Transit.

Mayor Mackey has engaged the New York engineering firm of Ford, Bacon & Davis to audit the revenues and expenditures of the line. The Mayor also intends engaging Charles C. McChord and J. Rowland Bibbins, utilities experts, of Washington, to act as advisers to the city in connection with the subway accounts.

Particular attention has been concentrated on the subway audit, as those findings will be used by the Administration and the P.R.T. as a basis for the negotiation of a permanent operating lease for the line.

Another transit development is Mayor Mackey's announcement that the city engineers had been instructed to proceed at once with drafting of plans for the construction of the Ridge Avenue extension of the Broad Street subway. In furtherance of that program an ordinance has been introduced in Council authorizing the opening of a diagonal thoroughfare from Ninth and Vine Streets to Eighth and Race Streets, which would provide an extension of the Ridge Avenue high-speed line required for an adequate engineering turn at Eighth and Race Streets. The delivery line would proceed south on Eighth Street from Race and hook up with subways planned east-and-west south of Chestnut Street.

The lease was passed by the Council on Aug. 28 and was laid on Mayor Mackey's desk for his signature on Aug. 30. A copy of the lease was rushed to Harrisburg at once so the pact could be considered by the Public Service body at a special meeting.

Failure of the operating agreement to provide transfer or exchange privileges from the subway to surface lines in the central business district south of Spring Garden Street again evoked criticism from various members of the Council when the ordinance came up for final passage.

Ratification of the subway lease by the Public Service Commission on Friday was expected to be the final important move preparatory to opening the new tube on Saturday.

Highway Traffic Increasingly Fatal

2,360 persons are being killed or seriously injured daily on highways. In 1927 there were 26,618 killed and 798 seriously injured. Discourtesy and carelessness largely responsible

DURING every 24 hours of 1928 an estimated average of 2,360 persons are being killed or seriously injured on the streets and highways of the United States. The estimated economic loss for the first six months of 1928 was $350,000,000, exclusive of small property damage and insurance premiums. At the present rate of increase the Grim Reaper will exact a toll of 40,000 human lives in highway accidents during 1935. These figures were part of an analytical highway safety report issued on Sept. 1 by the American Road Builders' Association.

During the first six months of 1928 the American Road Builders' Association estimates that 13,750 persons were killed and 412,500 seriously injured in highway accidents. The toll for 1927 was 26,618 killed and 798,700 seriously injured, a total of 825,318 casualties. At the present rate approximately 27,500 persons will be killed by the end of 1928.

Highway accidents are attributed to discourtesy and carelessness on the part of both drivers and pedestrians. The statistics prove:

1. That the most important causes of highway accidents where motorists are principally at fault are, in order of their importance — inattention, speeding, traffic law violation and intoxication. Of the 26,618 killed in 1927, motorists were at fault in 11,765 fatalities and all but 1,882 were attributed to these causes.

2. That the most important causes of highway accidents where motorists are principally at fault are: children playing in the street or crossing in violation of traffic law, adult jay-walking, inattention, and confusion. Of the 11,367 deaths caused principally by pedestrians in 1927, all but 1,250 were attributed to these causes.

3. That adverse physical conditions such as wet streets, defective roads, poor lights and narrow streets, caused only 3,586 deaths.

4. That the human factor is responsible for 95 per cent of all accidents.

5. That the human factor, which causes highway accidents, is largely the result of certain definable physical conditions such as complex traffic laws, traffic congestion, discourtesy on the part of fellow motorists, carelessness on the part of fellow motorists, fatigue, physical incompetency, lack of confidence and the improper conduct of pedestrians.

6. That approximately 60 per cent of all fatalities are pedestrians.

7. That more than 30 per cent of all fatalities are children of school age.

8. That accidents involving pedestrians continue to climb in number much faster than accidents involving only motorists.

The American Road Builders' Association has collected many data related to the causes of highway accidents. The organization has used, in addition, much information already made available by other associations interested in the safety problems. The road organization has launched as a result of its studies, a national highway safety campaign based upon what it believes to be the fundamental principles of highway accident prevention. These are in brief:

1. That all cities and communities should undertake local campaigns to educate pedestrian traffic in the principles of courtesy and caution while on the public street or highway. The use of common sense is recommended in lieu of complex traffic rules.

2. That all states should adopt a system of examination and licensing of motor vehicle drivers.

3. That the adoption of the uniform codes of state and municipal traffic laws based on the report prepared by the National Conference on Street and Highway Safety is desirable.

4. That the education of drivers in the principles of courtesy and caution should be undertaken in all communities.

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Accident in New York Subway

Many casualties when Interborough train is derailed in Seventh Avenue south of Times Square

SIXTEEN persons were killed, 25 others seriously injured and more than 100 others hurt, many of them only slightly, when the ninth car of a ten-car train of the Interborough Rapid Transit Company, New York, was derailed shortly after 5 p.m. on Aug. 24. The accident occurred just south of the 42nd Street station on the company's Seventh Avenue line.

Just what happened is still a matter of inquiry on the part of the Transit Commission and the railway, although the commission did make a preliminary statement on Aug. 25 in which it is said:

The train that was derailed was a ten-car steel subway express train. It left Times Square, southbound, at 5:08 p.m. The first eight cars passed over the north end of crossover No. 17, located south of the station.

The first truck of the ninth car took the regular southbound express track. The rear truck of the ninth car and the rear car took the switch leading into the middle track. This resulted in the ninth car's colliding with the curtain wall between the southbound express and the middle tracks. The impact of the collision caused this car to be cut in two at the center side door; the forward section was dragged approximately 100 ft. before the car stopped.

In the opinion of the commission's signal and switch experts, the switch that caused the derailment was turned into the middle track while the train was passing over the switch. There is nothing to show that the switch was turned by the train itself. It might have been turned over by a movement of the lever in the tower or by someone moving the switch valves located near the track.

It is the opinion of the commission's signal and switch experts that the accident was the result of man failure.

The switch that caused the derailment was not the switch that was out of order, but the one normally operated on the same circuit with the switch that was out of order. Good railroad operation would have required that the switch should have been spiked immediately when found out of order.

The switch being out of order could not have alone caused the derailment. When a switch goes out of order, the safety devices come into play, as they did, and halt the trains. The derailment was not directly caused by the switch being out of order, but by some improper operation of the switch while it was out of order.

President Hedley of the Interborough was quoted as follows:

I can only repeat that we sincerely regret this very unfortunate occurrence. I do want to say, however, that we have co-operated with the public authorities in every way by furnishing them with all the facts in our possession and producing employees as rapidly as we could after Police Commissioner Warren asked for them. While making our own investigation we will continue to co-operate with the public authorities.

The public may be assured that we will continue by constant vigilance to assure the utmost safety in the operation of this railroad.

The switch where the accident occurred had been repaired during the evening, and was supposedly in good condition. While the train which was wrecked was at the station, Baldwin, an employee in the signal tower, did not get a signal showing him that the switch was in correct position.

When the lever in the tower indicating this did not go back into place he went to the tracks and to the switch and said that it was in place for the train to pass. Baldwin accordingly instructed Carr to signal the train past, even though the signal light was against it. All of the train went over the switch satisfactorily until the ninth car, when the switch "split."

I never attempt to fix personal responsibility until I know all the facts.

William S. Baldwin, Interborough maintenance foreman, is charged with homicide in connection with the accident. It is expected that he will be arraigned on Sept. 17 after the facts are established as a result of the investigations now under way.

It was explained on Wednesday that the Interborough's investigation was still under way and that until it had been completed Mr. Hedley would make no comment, on the accident, the allocation of blame, or the offer to arbitrate the accident claims likely to arise as a result of the accident.

On Monday Mr. Hedley did say:

I find that our claim department has advised claimants that whenever they are ready we will pay whatever is fair and reasonable, and it has proceeded with such negotiations and has advised claimants to bide their time and take the matter up with the claim department at the claimants' convenience. Every person will be treated equitably and fairly and paid promptly. There is no need of law suits or even delay.

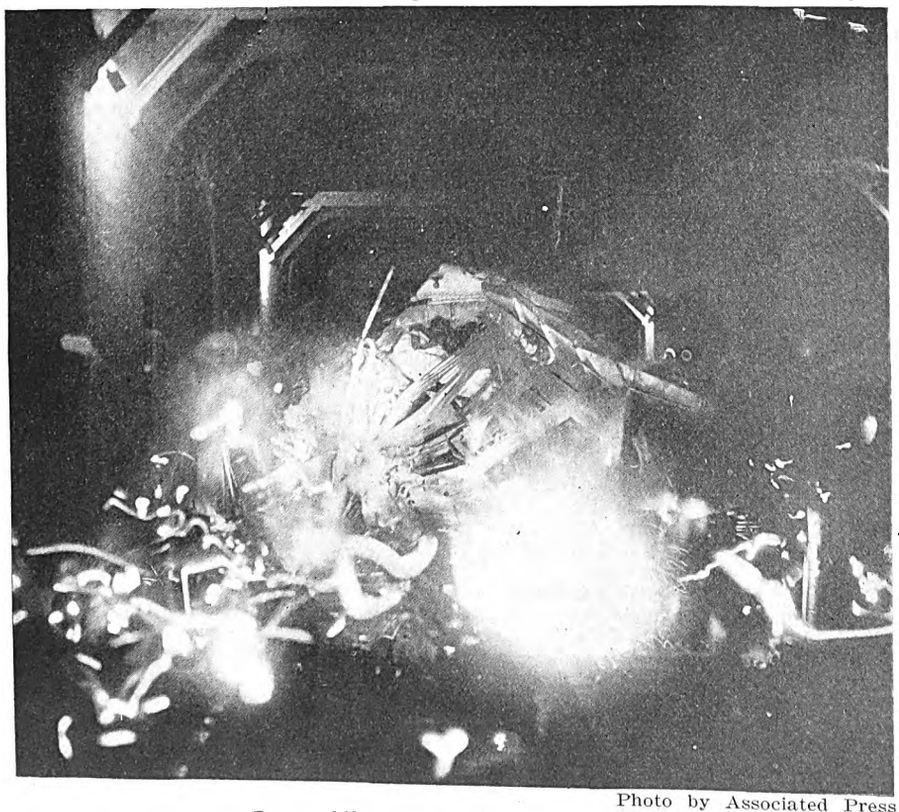

Photo by Associated Press

Scene while rescue work was in progress

Faster Service on Indiana Union Traction

Faster time of trains and greater convenience for travelers are provided in the new schedules issued on Union Traction Company lines, particularly between Indianapolis, Anderson, Muncie and Bluffton, and between Anderson and Wabash, Ind. F. D. Norviel, general passenger and freight agent of the company, says it is the plan to operate all trains as express trains except four of the fastest. All other trains will make all regular town and country stops where passengers desire to board or leave the cars. The time of trains, however, is from five to twenty minutes faster than those operated under previous schedules.

Little Things in Chicago Lead to Bigger Understanding

The Chicago Rapid Transit Company, the Chicago North Shore & Milwaukee Railroad, the Chicago Aurora & Elgin Railroad and the Chicago, South Shore & South Bend Railroad, all under the same general management, are carrying on a joint program for the standardization of forms and stationery. This work is being co-ordinated by the Business Research Corporation. As the result of investigations thus far, 219 forms have been eliminated as obsolete or unnecessary. In addition reductions and replacements have been made.

The necessary conferences have resulted, not only in discussions of stationery and forms, but in a broader understanding of the "other fellow's" company and the "other fellow's" job.

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Newspaper Comment on Schenectady Advance Favorable

In connection with the recent fare increase by which the rates in the city zone were advanced by the Schenectady Railway, Schenectady, N. Y., from 7 cents to 10 cents, with three tickets for 25 cents, and the interurban zone rates were increased to 10 cents each, regular riders will be permitted the use of tickets at the rate of 8⅓ cents per zone. Comments from the local press are interesting as showing an attitude of fairness toward the railway, and all the more so when it is considered from the political attitude of the papers printing the editorials, one being the Republican organ and the other sponsoring the Democratic cause.

The *Union-Star* said in part:

In granting the Schenectady Railway's application for permission to raise its fares to 10 cents, the Public Service Commission has done what it was expected it would do. The absence of comment would seem to augur well for the operation of the new rates. The experience of the Boston Elevated Railway, where fares were raised from 5 to 7 and then to 10 cents, was that whereas the 7-cent fare actually produced less revenue than the 5, because of the large falling off in the number of car riders, the 10-cent fare, with a smaller percentage of defections, easily supplied the necessary revenue to lift the company on to the right side of the ledger.

President Hustis assures the people of Schenectady that if the new fare works out as it is expected to do, the public will share with the company in the benefits. It will be time enough to renew requests for improved service when the results of operation on the new basis become known. The people realize that giving service at a loss cannot continue indefinitely. We believe they will co-operate with the company and make the new rates a success.

The *Gazette* said:

We believe that a majority of the people here have been more interested in having the Public Service Commission decide the 10-cent fare question than in what the determination itself might be. The railway is a local institution, affecting most of us directly or indirectly; and any uncertainty in connection with its affairs naturally makes conditions here less stable.

It was generally recognized that the railway was not earning sufficient money under the 7-cent fare to care for necessary improvements. Returns to the stockholders were out of the question. We well know that this is an intolerable situation, especially with a public utility.

The real question has been whether the people wished the railway to continue in operation, or to stop. To go on it had to meet certain demands, street paving being one of no mean importance.

Automobiles especially, and buses, have become such heavy competitors of the railways as to make their future something of a question. Hence, if the people wished the company to keep on operating, increased compensation became a necessity.

We may believe now, with the added fare, the railway will be able to carry out at least a part of the official program of improvements. This will give better service to the citizens in various ways. As a community's welfare depends so greatly upon the prosperity of its industries, it is well that the period of waiting, of indecision, is past.

Niagara Cataract Advertised by Railway

Nine large billboards, each 50 ft. long and 10 ft. high, and more than 1,000 directional arrows have been installed along more than 500 miles of state highways in Western New York and the province of Ontario, Canada, by the International Railway, Buffalo, urging motorists to use its Falls View Bridge at Niagara Falls connecting Canada and the United States across the Niagara Gorge.

On the American side of the border, these signs say "Enter Canada by Falls View Bridge," while on the Canadian side of the frontier, the signs say "Enter the United States by Falls View Bridge." For many years the bridge was known as the Upper Steel Arch Bridge, but some time ago the company changed the name to Falls View Bridge to differentiate the company's bridge from other vehicle bridges across the Gorge that do not provide a view of the American and Canadian cataracts.

The railway reports that the use of highway signs has stimulated motor traffic across the bridge. The billboards show a view of the cataract. The sign itself is in colors to command the attention of motorists.

"Making It Easy to Fly from Chicago"

Chicago is to have the first consolidated ticket office for airplane passengers in the United States. Announcement of the establishment of a completely-equipped air travel bureau and union ticket office in the new Palmer House at State and Monroe Streets was made during the week ended Sept. 1 by Thomas Wolfe, Jr., president of the Chicago Air Traffic Association.

In co-operation with hotel officials and the Parmelee Transfer Company, the Air Traffic Association will open an elaborate waiting room for air travelers in the downtown hostelry on Sept. 8. Robert L. Woodcock has been appointed manager of the new office.

Complete timetables on railroad connections and air line operations throughout the United States and Europe will be found at the station and attendants will be present from early morning until late evening to make through reservations. Room reservations at hotels along the route will be made by the bureau as well as for meals at wayside landings.

Members of the Air Traffic Association, which is sponsoring the project, include the National Air Transport, Inc., Northwest Airways, Inc., Embry-Riddle Company; Robertson Aircraft Corporation; and the Boeing Air Transport, Inc. This group of companies operates a total of 6,160 miles of airways, approximately 50 per cent of the total of air mail lines in the United States. These companies connect with all air mail lines, which will make it possible to secure air transport tickets at this office to almost every point in the United States. Connections with other lines give this group a total of 15,210 miles of airways. Mr. Wolfe was quoted as follows:

This station will mark one of the greatest steps forward in air transportation in this country and will put the industry on a basis comparable with the excellent European services.

War Veterans Have Preference in Seattle

Seattle war veterans who lost their jobs as employees of the municipal railway at the first of the year, when a wholesale reduction in the personnel was made, recently won a victory when the Supreme Court rendered a decision in favor of B. H. Beebe, one of the veterans, who had brought mandamus action against the city as a result of the department's moves. The court held that the preference given war veterans by law applied to retention in service as well as original employment.

The corporation counsel originally advised the civil service commission and the street railway department against the policy of letting men go, according to their efficiency rating and without regard to their status as veterans. Despite this he was later called upon to defend the city when Beebe brought suit. Beebe will not only win reinstatement on his regular run, but will also get $40 a month for the entire period since his discharge at the first of the year. He has been doing part time work for the railway since the loss of his regular run. The suit is an echo of the wholesale reduction in operating expenses in January, when 50 men were either laid off or put on part time. The matter was taken to the Supreme Court at the suggestion of the street railway superintendent and the civil service commission to make it a "test case."

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Fare Advance Likely in Kansas City

Readjustment of fares by the Kansas City Public Service Company, Kansas City, Mo., appears to be inevitable. Representatives of the company probably will not appear before a Council committee for some weeks, but they are devoting the interval to an extensive statistical study of the situation, with inquiry into the experience of other cities on fare schedules.

The rate most likely to be suggested would provide three tickets for 25 cents and a 10-cent cash fare. Street railway officials estimate that if some such fare schedule were adopted, 90 per cent of the car riders would buy tickets or tokens, paying 8⅓ cents for a ride. The occasional rider would pay 10 cents.

The plea for the 2-cent boost in cash fares and an advance of what is estimated to be about 1 cent in average fare is that the company otherwise cannot meet demands for service extensions or set up a depreciation fund, or even keep itself financially afloat if patronage continues to decline.

Under the existing schedule the cash fare on the railway lines is 8 cents. About 70 per cent of the riders buy tokens, two for 15 cents, which makes the cost of a ride 7½ cents. Tickets, under a provision of the last franchise, sell 15 for $1.

Action on Unification in New York Unlikely Till Fall

That the city administration has no intention of pushing consideration of the transit unification plan of Samuel Untermyer, special counsel for the Transit Commission, until fall was indicated on Aug. 15 when the Board of Estimate failed to discuss it. Mayor Walker said it was not likely the board would take any action until Sept. 27, when the board would hold its first regular meeting after the summer adjournment. In the interim, however, it was indicated the Untermyer proposal probably would be discussed in several executive sessions.

Seven-Cent Cash Fare in Lynchburg

The Lynchburg Traction & Light Company, Lynchburg, Va., has been authorized by the State Corporation Commission to increase cash fares from 6 to 7 cents. In its order allowing the increase the commission held that the company "is not earning a fair rate of return on the fair value of its property" and is entitled to the relief it asked in increased rates. The schedule of fares allowed by the commission became effective on Aug. 27.

The company sought new rates as follows:

1. A $1 transferable pass entitling the holder to unlimited transportation upon the lines of the company for a period of seven consecutive days, beginning at midnight every Sunday; or

2. Four tokens or tickets to be sold for 25 cents, each token or ticket entitling the passenger to one continuous trip between any two points on the company's lines, with a free transfer where necessary; or

3. A 7-cent cash fare, entitling the passenger to one continuous trip between any two points on the company's lines, with a free transfer where necessary.

Allied Power in New Offices

The Allied Power & Light Corporation and its affiliated companies announce the removal of their general offices on Sept. 1 to the new Chase National Bank Building, 20 Pine Street, New York City. The telephone is John 5560. President R. P. Stevens may be reached there, likewise B. C. Cobb, chairman, and directors J. T. Harrington, T. A. Kenney, W. H. Sawyer, Jacob Hekma, A. L. Loomis, H. S. Scarritt and L. K. Thorne.

Rockford Interurban Now Operated by Its Owner

B. J. Arnold, Chicago, its owner, is now operating the Elgin, Belvidere & Rockford Interurban Railway, it was announced by Adam Gschwindt, manager of the Rockford Electric Company, Rockford, Ill., who has been in charge of the electric line. The electric company explained that its desire to be relieved of the detail of operation of the interurban caused the change. The two concerns continue their association, the cars used as rolling stock being rented, terminals provided and power supplied by the Rockford Electric to the railway. Freight service will be discontinued on Sept. 1 and the Rockford Electric Company expects to discontinue its Illinois interurban freight lines at the same time. The Wisconsin Railroad Commission has not yet acted upon a petition to discontinue the lines in Wisconsin.

100 Per Cent One-Man Operation

All cars of International Railway in Buffalo, Niagara Falls and Lockport run with one man. Accidents greatly reduced in number

IN THREE cities of the International Railway system on the Niagara frontier—Buffalo, Niagara Falls and Lockport—all local street car service is now rendered by one-man cars. Mitten Management began the program of conversion to one-man operation in Buffalo in 1923 and extended its replacement of two-man operation line by line as rapidly as it was able to provide its cars with full safety equipment.

During this gradual change in the method of operation there has been a continuous reduction in accidents. In 1927 there were 15 per cent fewer accidents than in 1926 and 33 per cent fewer than in 1923, when conversion to one-man operation began. Excluding automobile collisions, which should not be considered on account of the enormous increase in the number of these vehicles now using the streets, I.R.C. accidents are now running approximately 50 per cent below those experienced ten years ago.

In the earlier months of the transition period, the company followed the policy of giving the public complete information regarding the change, in order that riders might know the advantages of one-man operation from their standpoint. When the first few lines were converted there was some public opposition. As operators and passengers became more familiar with the new conditions, however, this public suspicion of the innovation ceased and criticism, either expressed or implied, is now extremely rare.

With the thought in mind that it is obviously unwise to have cars standing at heavy loading points with other traffic piling up behind while the one-man operator strives to make a quick job of his fare collection, change making and transfer issuing, the company started on each one-man line the pay-in-the-country method of fare collection. Thus fare collection is eliminated from the heavy loading points and on the outbound trip the entire car becomes a loading platform with obvious advantages in inclement weather or under peak load conditions.

Dash signs were used to indicate the method of fare collection, while "read as you ride" folders and newspaper publicity were employed to describe the improvements in equipment and service, which included increased seating capacity and shorter headway, as well as greater safety.

Changes in the equipment included a complete overhaul from track to trolley wire of 251 cars, which were actually rebuilt in the company's shops, and installation of 100 per cent safety apparatus in all city cars. Three types of cars comprised the majority of equipment, the so-called 6000 type, a near-side car of the front entrance, front exit type, on which the pay-as-you-enter system of fare collection had been employed; the double-end car with the pay-as-you-enter system adapted to rear entrance, front exit, and the Peter Witt type on which the pay-as-you-pass system had been in vogue, passengers entering by the front of the car and leaving by the center. All types of cars were adapted for front entrance, front exit in order to conform to the pay-in-the-country method of fare collection.

At the start of one-man service on each route, the line was literally flooded with cars in order that no operator might have an overload during the transition period and in order that pas-

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sengers as well as men might have a chance to adjust themselves to the changes. As the men became more experienced trippers were removed until the schedule showed only slight additional service over that provided with two-man operation. An average of 10 per cent was added to the running time during the transition period, but practically all the additional running time was removed after a few months of operation.

The economies produced through one-man operation have permitted a higher standard of maintenance of equipment and have enabled the company to start a track and paving reconstruction program in addition to providing safer service.

The change from two-man to one-man operation was accomplished without the discharge or laying off of any employees. As the last few lines, which were heavily traveled routes passing through the business section of Buffalo, were converted the oldest and most experienced employees voluntarily selected runs on these routes in order to assure themselves that the exacting conditions of the first few weeks of operation over these heavily congested streets should meet every test.

Selective Stops Urged for Indianapolis

Efforts of residents in the eastern section of Indianapolis, Ind., to have the Indianapolis Street Railway place in operation a selective stop system during rush hours each day have been revived in a petition to the Indiana Public Service Commission. The petition, which was the same as that presented some time ago to the Indianapolis Board of Public Works, contained the names of more than 500 residents of the section. It suggests that cars be divided into three groups, the cars in each group to be marked by a distinctive emblem. Emblems similar to those on the cars would be placed at street intersections along the line and the patron would know that a car with a certain emblem stopped only at certain street corners.

Boston Elevated Warns Against Transfer Abuse

In an attempt to stop misuse of transfers the Boston Elevated Railway, Boston, Mass., has posted signs at the Northampton Street and Dover Street stations, calling attention to the number of persons prosecuted since Jan. 1, 1928, for misuse of transfers obtained at these stations. The management hopes, by these signs:

To deter persons from using transfers not properly obtained.

To deter persons from procuring, on cars or at stations, transfers which they do not intend to use and then giving them away or throwing them away where they may be picked up.

To stop the practice of swapping transfers.

To stop the using of transfers as stop-overs by traveling from point to point and transacting business in various places all through payment of one fare.

To stop the practice of taking two or more transfers on leaving a station and then giving them to persons waiting at transfer points, who thereby secure transportation without payment of any fare at all.

Mussolini of Traffic Demanded by Detroit's Ex-Mayor

Unification of all transportation under city ownership, with buses, taxicabs, jitneys and street cars owned by the public, and the appointment of "a transportation Mussolini with full power to act in spite of the threats in intimidating, and sometimes corrupt, lobbyists for special interests," is the two-fold transportation plan of John W. Smith, former mayor. He is quoted by the Detroit *Times* in part as follows:

We'll never get anywhere until all taxis, all buses, all means of transportations are municipally owned, and co-ordinated. And we will never get this unification of transportation facilities until we get a Napoleon or a Mussolini of transportation who isn't afraid of all the lobbyists for special interests who are blocking every unified transportation scheme proposed.

We may get experts to figure out in a cold-blooded way what is best for the greatest number. They may do it without regard to political expediency or interest. Then what happens? I have seen the city employ numerous experts and I have never seen the city accept the report of a single one of them.

In comes the lobbyist. He blusters and bluffs and intimidates, and Councilmen waver. Finally they do what he wishes.

That's why we need a transportation czar, not subjected to anybody, like the Council, which adjusts its course to every political wind that blows, whether it be a squall or just a sunset breeze.

Unification under city ownership is the answer. But it is only part of the answer. The transportation czar is the other part. A man who will kick out of his office every corrupt lobbyist who cares not for the welfare of the whole people, but wants only something for his own little selfish group, or something which is in accordance with his own pet scheme.

The present situation is an indictment of public officials. Here is a city committed to municipal ownership which permits buses, jitneys and taxis to take revenue from the municipally owned Department of Street Railways.

If the people want jitneys, let them have them, but let them be municipally owned. If they want buses, let them have them, but have them municipally owned. Whatever they want, give it to them, but have every intra-city means of transportation co-ordinated under municipal ownership.

There is no question that the Department of Street Railways needs refinancing. There is no doubt but that the city needs immediate relief, instead of relief at some future date. Let all transportation be co-ordinated under city ownership, eliminating waste, duplication, and even bloodshed; let the street railways be refinanced so that improvements and extensions can be made, and you will have immediate relief.

Let us have city officials with courage enough to take the city's municipal ownership principles seriously, and then let us have some one as a transportation head who will co-ordinate all transportation to eliminate waste, duplication, and unnecessary expense. Let this "czar" be free to say to the lobbyist for special groups, "Get out of my office. Here's the money we have to spend. Here is what is best for all the people."

Leading the People Astray

BUSINESS cannot sit dumbly by and trust to luck to foster a proper public appreciation of the things it is doing to improve its service and to deserve public trust and confidence. It must not suffer itself to be misrepresented by every Tom, Dick and Harry who would curry brief favor by exaggeration of half truths and downright scandal-mongering. Such negligence to speak the truth in its own behalf is unfair both to business and to the public, for, in the last analysis, the welfare and prosperity of every one of us—the public—is intimately intertwined with the welfare of those processes we call business.

If business neglects this duty, this duty of truth-telling as to its own functions and processes, it has no right to complain if the people are led astray after false doctrines and deceived and beguiled by untruths in relation to that which they have never been taught properly to understand.—President Butterworth before the Rock Island Rotary Club.

Virginia Power Operators Identified

The Virginia Electric & Power Company, Richmond, Va., has instituted the custom of carrying the name of each car and each bus operator on a brass plate inserted in the front of the fare box. The purpose is to assist the passengers in identifying the operator and to add a personal touch which, it is believed, will work for better service on the part of the employees and promote friendly relations between the riders and the company. The name plates are being used on the rolling stock run in Richmond, Norfolk, Portsmouth and Petersburg.

Large Route Numbers in St. Louis

In a further effort to improve transportation service in the city and county the St. Louis Public Service Company on June 28 adopted a system of large route numbers for all its cars. The old system of destination signs, bearing the names of the various divisions, is continued, but is supplemented and improved by the larger route number, which appears in a panel to the right of the old signs.

Bus lines operated by the company also carry the new numbers in addition to the destination signs. The numbers reserved for the street car routes run from 1 to 100, while the bus numbers start at 100. The system includes 44 car divisions and twelve bus routes.

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Rights of New Company in Indianapolis Upheld

An injunction prohibiting the Indianapolis Street Railway from interfering with the operation of interurban cars of the Indianapolis & Southeastern Railroad for 90 days has been issued in Circuit Court at Rushville, Ind. The injunction holds for a sufficient time to permit the new owners of the Indianapolis & Southeastern to sign contracts with the Indianapolis Street Railway permitting them to operate cars from the interurban line over the city streets in Indianapolis and also use the electric railway terminal building in Indianapolis. The litigation resulted from a twelve-hour delay of service a week before when the Indianapolis company prevented the use of its tracks by the interurban company.

Payroll of Bus Company Stolen by Bandits

Five minutes after an $18,000 payroll had been delivered in an armored car at the Surface Transportation Company garage, 180th Street and Webster Avenue, the Bronx, at 10 a.m., on Aug. 23, four armed thugs held up the office force and seized the money. Through a hail of bullets from a riot gun they escaped in a Lincoln sedan, but only after they had wounded one man, nearly run down another, wrecked their automobile and commandeered a second one. The Surface Transportation Company is a subsidiary of the Third Avenue Railway.

New Stone Mountain Operating Plan

The Georgia Power Company, Atlanta, Ga., has been authorized by the Public Service Commission to run its Stone Mountain cars only as far as Decatur on the way to Atlanta. The company has also been authorized to rearrange its schedule so that more cars could be run at night during the rush hour and fewer in the day time when business is light. Passengers on the Stone Mountain line will be permitted to transfer at Decatur to the south Decatur or the north Decatur line and proceed to Atlanta without additional charge. The company has also been authorized to discontinue the sale of commutation ticket books. A passenger station in which passengers may wait for connecting cars is being maintained at Decatur. The order went into effect on Aug. 20.

Ohio Interurban Confronted With Demand for Improvements

Efforts of the City of Columbus, Ohio, to force the Indiana, Columbus & Eastern Traction Company to do its share of the proposed repaving of Columbus streets may precipitate abandonment of the company's line from Columbus to Zanesville. The company now is facing demands for improvements in Columbus, Newark and along the National Highway, but it is unable to proceed because for some time it has been operating at a loss.

Should the company decide to abandon its line to Zanesville, it is predicted that this also will mean the abandonment of the East Mound Street car line of the Columbus Railway, Power & Light Company, which leases the right to run its cars over the tracks owned by the Indiana, Columbus & Eastern Traction Company.

Winners of Sales Essays to Go to Cleveland

All car and coach operators and all shop men of the Erie Railways Company and the Erie Coach Company, Erie, Pa., have been invited to submit articles on the subject "Selling Rides to the Public," the men submitting the three articles adjudged to be the best to be rewarded with a trip to the convention of the American Electric Railway Association in Cleveland in September. The foremen, supervisors and superintendents are not eligible to compete since the program of the company contemplates their being sent. An official announcement says:

Do you want a free trip to Cleveland?

The week of Sept. 25 the American Electric Railway Association will have a convention and exhibit at Cleveland and anyone employed in the street railway industry who attends that meeting will see and hear many things of interest.

This company would be very glad to have any employee (this means you) submit an article on the subject, "Selling Rides—Making Friends for One's Self and for the Company.

Limit your article to 250 words. Have the same in the hands of Mr. Nolan not later than Monday, Sept. 10. Mr. Nolan, Mr. Schuwerk and Mr. Brown will be the judges, and the authors of the three best articles, as selected by this committee, will be entitled to a free trip to Cleveland on Wednesday, Sept. 26, the day set aside at the convention for a general inspection of all exhibits.

The company will pay the winners their full day's wages and all their expenses for transportation, meals, etc., while at Cleveland.

Three fellows are going—be one of them.

R. C. Ashworth to Assist in San Francisco Valuation

City Engineer O'Shaughnessy of San Francisco, Cal., has announced the appointment of Raymond C. Ashworth as valuation expert to assist his office in fixing valuations on the properties of the Market Street Railway and California Street Cable Railway, preliminary to negotiations for their acquisition by the city. Mr. O'Shaughnessy said that the valuation of the railway properties will require between two and three months and that the preliminary steps have already been started under direction of Paul Ost, assistant city engineer, and his staff. Mr. Ost is engineer in charge of the Municipal Railway for the city.

Opposition to Illinois Traction Withdrawn at St. Louis

Opponents of the 50-year franchise recently granted to the Illinois Terminal System by the city of St. Louis, Mo., have abandoned their plans for a city-wide referendum election on the question. The company proposes to spend about $5,000,000 in improvements in St. Louis, including a subway, surface and elevated system connecting the McKinley Bridge with a new downtown passenger and freight terminal at Twelfth Boulevard and Lucas Avenue. Opponents of the plan contended it would create a dangerous grade crossing at Cass Avenue.

Seattle Suit to Be Heard Sept. 17

Sept. 17 has been set as the date for the hearing of the case of the Puget Sound Power & Light Company vs. the city of Seattle, Wash., and others in the Circuit Court of Appeals. At San Francisco on Aug. 20 the court denied a petition of the company for a rehearing of the suit of J. G. Von Herberg, Seattle capitalist, against the city of Seattle. Attorneys for the power company indicate that an appeal to the United States Supreme Court will probably be taken. The Von Herberg suit seeks to establish the priority of wage claims against the railway over bond retirement payment on the $15,000,000 purchase price the city agreed to pay the power company for the railway property now included in the Seattle municipal system.

The recent circuit court decision again remands the case back for trial in the Superior Court in Seattle. The federal court in Seattle originally considered the matter, but the appeal court later held that it had no jurisdiction as no interstate issue was involved.

Seven Sisters Falls to Go to Winnipeg Company

The latest advices from Ottawa bear out the opinion, frequently expressed, that the Winnipeg Electric Company is to obtain the Seven Sisters Falls power site. It is said that within a few days the final settlement may be expected between the Dominion and the Manitoba governments as to the disposition of the site. When Premier John Bracken, of Manitoba, was in Ottawa for the conference on natural resources, he withdrew the application of his government for the development of the Seven Sisters site. Hence, the field is now left open for the consideration of the Winnipeg Electric Power Company's application. It is understood, moreover, that the Manitoba premier has notified the Dominion government that he is in favor of having the falls awarded to the private company for development. Hon. Charles Stewart, Federal Minister of the Interior, has been in Winnipeg conferring with Premier Bracken, and it is said that the transfer will be completed very shortly.

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Recent Bus Developments

Additional Bus Service in St. Louis

The St. Louis Public Service Company, St. Louis, Mo., has increased the bus service for the Pine Lawn and Jennings sections of St. Louis County. Seven new 40-passenger twin coaches have been placed in service on the Natural Bridge line No. 104, operating from Natural Bridge Avenue and Kingshighway Boulevard to Robin and West Florissant Avenue via Jennings Road.

Four 29-passenger buses have been placed on the line from Kingshighway to Helen and Melrose Avenues. This gives four-minute bus service on Natural Bridge Avenue as far west as Pine Lawn and an eight-minute service for the balance of this loop line. During non-rush hours a twelve-minute schedule will be maintained.

The east end of the Natural Bridge Avenue line has been divorced from route No. 105 and a new bus line known as route 116 established. It runs from Shreve and Natural Bridge Avenues to Taylor and West Florissant Avenues. At its south end this line loops around Sacramento, Marcus, Natural Bridge and Shreve Avenues.

Crosstown Service in Gary

A new crosstown bus route providing half-hourly service to a rapidly growing residential area of Gary, Ind., lying west of Broadway, was opened for service on Sunday, Aug. 26, by the Gary Railways. The new line, traveling a rectangular route over 25th Avenue, Grant Street and 15th Avenue, approximately 3½ miles in length, connects with street cars operated to the downtown business district on Broadway at 25th and 15th Avenues. Free transfers are issued from bus to street car.

Around the U. S. A., from Akron

M. R. McNutt, who has specialized in chartered car and bus service ever since he joined the Northern Ohio Power & Light Company, Akron, Ohio, contributed to the *Northern Light*, published by the company, for August an article on its chartered car and bus service. He concludes as follows:

With the demand for special buses steadily growing it is reasonable to believe that by next year we will have handled trips from Coast to Coast and from Lakes to Gulf. It is a common occurrence now to be called on for trips to Boston, New York City, Atlantic City, Washington, Detroit, Buffalo, Chicago, and even to southern cities such as Montgomery and Nashville. The tendency is towards longer and longer trips, although the number of shorter ones continues to increase.

"John Public" is developing "bus appeal" and getting "bus wise." He is bound to "ride on rubber and air," free from soot and smoke, through nature's own wonderland, which is best enjoyed from a comfortable seat in a motor coach rolling along our network of highways.

We have the buses and we have the men. The public is thoroughly sold on the idea of chartering buses. Our booking offices are located in Cleveland, Akron and Canton, right in the heart of Ohio and the great Middle West. The entire organization is enthusiastic. What other combination of favorable conditions could be considered more ideal or promise a brighter future?

Patrons Protest Indianapolis Bus Fare

Notice has been filed with the Indiana Public Service Commission by Joseph H. Schaub, Jr., and a group of patrons of the Peoples Motor Coach Company, Indianapolis, announcing that an appeal will be taken from the commission's order of July 18, in which the 10-cent fare of the company was held reasonable and was continued in effect indefinitely. Schaub and his associates filed a complaint with the commission in November of last year against the fare charged by the coach company and asked a reduction. In the course of the investigation, the commission had an inventory made of the company's property and audited the company's books. The appeal will be taken to the Circuit Court in Indianapolis.

Taxicab War Threatens in Cleveland

The possibility of a taxicab war loomed in Cleveland, Ohio, when three newly established companies announced almost simultaneously on Aug. 29 that they are planning to invade the city within a few weeks with hundreds of cut-rate cabs.

Joseph H. Alexander, president of the Cleveland Railway, immediately served notice on the taxicab companies and the public generally that the railway will oppose any taxicab operations which might tend to slow up the movement of street cars and thereby increase operating costs and bring higher fares.

He pointed out that all desirable taxicab stands are now taken by established taxicab companies and that new companies, in order to operate, would have to depend for their business on cruising, which undoubtedly would result in increased traffic congestion and slower movement of street cars in the downtown district.

Before any of the new cab companies started in operation, Safety Director Edwin D. Barry called in the officials and warned them that cruising will not be tolerated by the police and that all companies will be required to observe strictly the city ordinances governing taxicab operations.

The cut-rate companies plan to operate on the basis of 25 cents for the first mile and 20 cents a mile thereafter. The old rate is 25 cents for the flag throw and 10 cents for each two-fifths of a mile thereafter.

The day following the announcement of the cut-rate cab invasion, the Yellow Cab Company posted notices authorizing customers to deduct as high as $1 from the fare shown by the meters.

Another Bus Line for Hartford

The Connecticut Company, Hartford, Conn., will operate a bus line from Gold Street, Hartford, to reservoir No. 4, a distance of 10 miles, as a part of its Hartford recreational system. The fare in each direction will be 25 cents, and the line will follow as nearly as possible the route of the Hartford-New Britain bus line. The Public Utilities Commission has granted the petition. For the present three trips will be made daily.

Fatal Bus Accident Causes Demand for Regulation

Immediate legislation for control of interstate bus operation is needed. This is the belief of Frank W. Matson of the Minnesota Railroad & Warehouse Commission in charge of bus transportation hearings, following an accident on Aug. 20, 4 miles north of Red Wing, Minn., in which four passengers were burned to death, four sent to hospitals and from which the driver has since died.

The accident occurred on a curve. The bus, running at 40 m.p.h., struck a state fisheries truck. The bus driver is said to have been at the wheel nearly fifteen hours.

The bus, operated by the Interstate Travel Bureau, doing no intrastate business, was not under regulatory control. It bore Minnesota and Wisconsin license tags. Chairman O. P. B. Jacobson of the commission said.

The commission nominally has control, but there are no teeth in the law. We need remedial legislation on this matter.

Mr. Matson said if it is found Minnesota bus operators are working their men long hours, rules will be promulgated limiting the time, as in the case of railroads.

E. F. Zelle, president of the Minnesota Motor Bus Association, said that in twelve years of bus operation there has never been loss of life on any buses operated by its members.

Extension of Bus Service in Massachusetts City

The Transportation Board at Springfield, Mass., has granted the petition of the Springfield Street Railway for a bus line to take the place of present car service. The action includes permission to extend the route from the terminal at Bay and Princeton Streets to take in Burr and Cambridge Streets and Oak Grove Avenue by means of a loop.

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Financial *and* Corporate

Merger Before Commission

Approval sought of deal under which sixteen companies in Indiana, including Terre Haute, Indianapolis & Eastern would be brought together

A PETITION for the proposed $70,000,000 merger of sixteen electric power and transportation companies in Indiana under the Indiana Electric Corporation, was filed Aug. 28 with the Indiana Public Service Commission. The companies, with total outstanding securities of $77,554,542 include the Central Indiana Power Company and several subsidiaries, all controlled by the Insull interests, and the properties of the Terre Haute, Indianapolis & Eastern Traction Company.

Case Assigned to Commissioner Harmon

No statement was made by Frank Singleton, chairman of the Public Service Commission, as to whether a complete appraisal by the commission engineers and an audit by commission accountants will be made, but he said that the commission will study the petition closely before taking final action. He assigned the case to Harvey Harmon.

Halsey, Stuart & Company, of Chicago, are consolidation managers for the merger. They have acted as agents for the last two years in arranging the terms of exchanges between the stockholders of the present companies and the promoters of the new corporation. This has been a long process since factions holding many different views had to be reconciled.

No mention of the Indianapolis Street Railway as a party to the merger is made in the petition except that all of the common stock of the city company is owned by the Terre Haute, Indianapolis & Eastern.

One paragraph of the petition explains that an agreement has been reached by owners of more than three-fourths the voting stock of the two merging companies to combine all under one ownership, except the electric interurban railroad lines extending from Indianapolis to Martinsville, Richmond, Lafayette and Crawfordsville, the line from Crawfordsville to Lebanon and the line from Dunreith to Newcastle and the city lines in Richmond. The petition says:

Combination in the Public Interest

The proposed combination is in the public interest. The properties in question occupy in a large measure the same general territory in the central part of the state. These controlled by the Central Indiana Power Company are so interconnected as to form at the present time a single operating unit. Those controlled by the Terre Haute, Indianapolis & Eastern are similarly interconnected among themselves. Physical connections of the two groups of properties already exist at Indianapolis, Terre Haute, Greencastle and at other intermediate points. The bringing of all these properties under one ownership will make available at all times to the railroad properties and to the electric property in Terre Haute the large electrical production facilities existing in the Central Indiana power group.

The petition proposes to organize a corporation under the name of the Indiana Central Rapid Transit Company, which shall acquire from the Terre Haute, Indianapolis & Eastern Traction Company, the electric interurban railroad from Indianapolis to Richmond, including the Dunreith-Newcastle branch and the Richmond city lines. This property is to be acquired subject to the mortgage of the Terre Haute, Indianapolis & Eastern securing its present outstanding first and second mortgage bonds, in consideration of the issuance to the Terre Haute, Indianapolis & Eastern of the entire capital stock of 50,000 shares of the common stock without par value of the said Indiana Central Rapid Transit Company.

The terms of the proposed merger have been reviewed at length previously in Electric Railway Journal.

Preferred Dividend Cut in Kansas City

Directors of the Kansas City Public Service Company, Kansas City, Mo., on Aug. 23, decided to reduce the preferred stock dividend, due on Oct. 1, from $1.75 to $1 a share. Powell C. Groner, president, said the decline in earnings caused by decreased business made the action advisable.

According to figures submitted by the directors, the cars carried approximately 124,000,000 passengers in 1926 and, at the present rate of use, will carry approximately 108,000,000 this year. This explains the decrease in revenue.

Operating expenses in 1928 were about $1,000,000 less than in 1926, Mr. Groner said, but the decline in earnings offset that saving. He called attention to the fact that in 1927 all net earnings except two dividends on the preferred stock were put back into improving the property.

The 1928 estimate is for net earnings of approximately $1,550,000. Of this amount $850,000 will be for bond interest; $371,000 for preferred stock dividends and $329,000 will be available to be put back into the property.

This last amount could be taken by the stockholders, Mr. Groner observed, but the attitude is to put every dollar possible back into improvements and additions that will aid service.

Net Profit in Brisbane

Tramway earnings without consideration of bus operation realized £17,313. Falling off in passengers carried

AFTER paying interest on the capital and 1 per cent to the sinking fund and making full provision for depreciation, there was a working profit in 1927 of £17,313 on the tramways operated by the Brisbane City Council, Brisbane, Australia. Against this, however, the loss on the working of the buses was £9,099. The loss of capital on the sale of them was £5,062. This total bus loss of £14,161 can all be extinguished out of the tramway earnings and leave a net profit of £3,152 for the year. With this introduction, G. R. Steer submits the tenth annual report of the Brisbane Tramways for the year ended Dec. 31, 1927.

The true position with regard to the working of the tramways, eliminating the figures for buses, which were sold in November, is disclosed in the following table.

The tramway earnings were		£814,312
Less operating expenses		613,285
Net revenue (equal to a return of 9.81 per cent on the capital)		£201,027
Less interest on loans	£98,932	
Less sinking fund payments	20,000	
Less depreciation account	57,782	
Less amortization account	7,000	
		183,714
Leaving a net profit of		£17,313

This result has been attained during a period of financial stress and instead of traffic increasing with the growing population there was a considerable decrease in the number of passengers during the latter part of the year. The number of passengers carried decreased from 81,802,945 in 1926 to 78,057,620 in 1927, and although this is partly due to the increase in the minimum fare from 1 penny to 2 pennies and the extension of the system of issuing 4-penny and 5-penny tickets for a through journey where formerly two tickets were issued, business also fell off in the last five months of the year when the sections and tickets were exactly the same as in the corresponding period of 1926. The position has been met by the exercise of many economies and the better state of the tracks, road surfaces, overhead structures, electric motors, car bodies and trucks enabled a substantial saving.

The number of miles run in 1927 was 6,535,833, an increase of 234,707 over the preceding year, or an average of 643 additional miles daily. Compared with five years ago the increase in the distance run last year was equal to an average of 3,927 miles per day.

The loss on tramway and bus operation brought forward from 1926 was £23,071, and the profit of £3,152 for 1927 leaves a debit balance of £19,919 to be carried forward to 1928. This is almost wholly due to £19,792 lost on the buses in two years and on the vehicles at their sales.

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STATISTICS OF THE TRAMWAY IN BRISBANE

	1922	1923	1924	1925	1926	1927
Revenue	£596,285	£628,841	£663,747	£706,520	£767,708	£814,312
Working expenses	434,064	443,885	536,989	563,604	588,262	623,285
Net revenue	162,221	184,956	126,758	142,916	179,446	201,027
Proportion of working expenses to revenue, per cent	72.79	70.59	80.90	79.77	76.63	75.31
Passengers carried	71,529,033	74,721,594	78,367,194	82,514,979	81,802,945	78,057,620
Car miles run	5,102,524	5,212,971	5,457,800	5,915,844	6,301,126	6,535,833

The comparison between the working results for 1927 (excluding buses) and previous years is shown in the accompanying table.

A partial increase in fare operated from Aug. 1, 1926 and the earnings for 1927 would have been higher if there had not been a reduction of £5,978 in miscellaneous earnings, principally due to the fact that in 1926 the Department had funds producing interest. Another important figure is the proportion which the excess of revenue over working expenses bears to capital expenditure, which stands at £2,050,155, excluding buses and allowing for depreciation. The tramways net earnings were £201,027, which is equal to 9.81 per cent of the capital. Mr. Steer then compares these results with tramways in other places and says that the operating ratio compares favorably with many of the larger systems.

Thirteen new drop-center cars were placed in service in 1927, bringing the total number of cars up to 260. At the end of the year fifteen new cars were being delivered, but more will be required before long to replace obsolete vehicles. All new cars are being fitted with windscreens for the motormen and the floors are being covered with rubber, which is easier to clean and more hygienic than wooden laths. In 1927 orders were placed for 40 tramway motors of Australian manufacture.

Under public ownership 11 miles of new lines have been built (equal to 14¾ track miles), 7¾ miles of single track have been converted into double lines, and 27 miles of old track have been rebuilt with new materials, making a total length of 49½ miles of line laid within the last five years, which represents 53 per cent of the total track mileage of 93 miles.

Buses continued to operate on three routes until November, 1927, when nine of the vehicles were sold and the services were transferred to private enterprise. The remaining two buses were converted into trucks for general use by the Tramways Department. Up to the time of sale the buses carried 1,332,940 passengers last year for a revenue of £15,318, and the working expenses were £19,649. In addition to this shortage, depreciation and interest absorbed £4,768, making a loss of £9,099 for the year. The loss on the buses in two years has been £19,792, so that financially, Mr. Steer said, the venture proved unfortunate. The loss could not be taken as an indication, he maintained, that less expensive buses could not be successfully operated under more favorable conditions, but the depreciation averaged nearly £8 a bus per week and tire renewals averaged £5 12s. a bus per week.

General Manager Steer referred to the interest that had been taken by the staff in submitting suggestions for the more efficient and economical working of the department and the results that amply justify the creation of the board. During 1927 final consideration was given to 77 separate suggestions and fourteen of them were adopted and put into operation.

Suburban Road in Massachusetts to Discontinue

Electric railway service between Milford and North Grafton, Mass., will be discontinued at midnight on Aug. 31. The line passes through Hopedale, Upton, West Upton and Grafton Center. It has been operated by the Milford, Framingham, Hopedale & Uxbridge Street Railway, but between Hopedale and North Grafton the cars pass over the rails of the Grafton & Upton Railroad. The abandonment of service between Milford and Hopedale also is under consideration.

In this connection representatives of the Boston, Worcester & New York Street Railway have been checking traffic on the Framingham to Uxbridge Coach Line with the idea of negotiating for its purchase as it would enable them to operate buses from Milford to Saxonville and there connect with Boston and Worcester buses.

Announcement of the abandonment of the Milford and North Grafton line has been followed by talk of organization of bus service between Milford and Worcester to pass through Hopedale and along the Milford and Worcester highway, giving better service to the patrons in Upton and West Upton. In the Uptons the buses would traverse Main Street, whereas for nearly ten years the trolley operated over the railroad some distance from the main thoroughfare. The Grafton & Upton Railroad, an independent concern controlled by the Draper interests of Hopedale, will continue to operate freight service between Hopedale and North Grafton.

Joseph Gordon, a director, says that since his company took over the Milford & Uxbridge Street Railway on May 4 the Grafton and Upton branch has been losing money, although the Grafton & Upton Railroad paid his concern a reasonable amount in an effort to offset these losses. Figures compiled by Mr. Gordon and his associates indicate a loss of from $1,000 to $1,200 a month on the 14 miles of track between Hopedale and North Grafton.

The company has been willing to continue operating cars if it could secure a guarantee from some source to meet expenses. The operators of the Grafton & Upton Railroad, however, could not see how they could contribute a larger sum to keep the cars running over their line and agreed to the abandonment. On the Grafton and Upton division the cars have been making nine round trips daily.

No decision has yet been reached by the Milford, Framingham, Hopedale & Uxbridge Street Railway about abandoning the Milford to Hopedale trolley line. Only three round trips on five days a week are being made on this line, operated principally to accommodate Draper Corporation workmen who live in Milford.

Trolley service between Milford and North Grafton has been maintained since June, 1902. The Grafton & Upton Railroad has been used largely for the movement of freight for the Draper Corporation at Hopedale and the William Knowlton & Sons hat plant at West Upton and for the conveyance of their employees who live in surrounding towns.

Valuation Case Returned to Tennessee Commission

A revaluation of the properties of the Tennessee Eastern Electric Company and the Johnson City Traction Company by the Tennessee Railroad & Public Utilities Commission has been ordered by Judge A. B. Neil in circuit court in his opinion handed down in the case of the companies against the commission.

The companies contended that the valuation of $225,000 placed on the Johnson City Traction Company and the $2,500,000 as placed on the Tennessee Eastern Electric Company would force those companies to charge rates which would practically mean confiscation of their properties. Judge Neil upheld the commission in its sole right to set the value, but remanded the case on account of errors of detail.

The case resulted from the valuation placed on the properties of the two companies in 1926 and the subsequent petition of the companies for a trial before the state court. The commission set the value of the properties at $2,725,000, to which the companies replied that their value was $6,659,878. The petitioners alleged that the commission acted contrary to law in "determining value based upon the testimony of witnesses F. G. Proutt, McGregor Smith and W. H. Corddry, because of their lack of experience and lack of knowledge of the matters about which they testified." The court said:

For this court to try this case *de novo* would mean an emasculation of the law creating the commission and would destroy its power and authority. Any person or corporation interested in any proceedings before the commission could treat it with contempt and choose for himself another tribunal in which to try the cause.

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Public System Reports Profit for Three Months

The Greenfield & Montague Transportation Area, Greenfield, Mass., reports net income of $8,308 for the three months ended June 30. Operating revenue was $45,483; other revenue, $338; gross income, $45,822. Expenditures for maintenance were $7,131; equipment, $6,827; power, $8,656; transportation, $9,801; miscellaneous, $5,095; total, $37,513.

N.O.P. Quits Massillon

Legislation is now before the City Council of Massillon, Ohio, granting the Northern Ohio Power & Light Company the right to abandon its city lines in Massillon. It permits retention of the interurban line. The Massillon franchise has approximately four years to run. The company has been losing $50,000 a year on its Massillon city operation. It feels it cannot continue this loss. The interurban line extending south of Massillon is also losing money and some action relative to this situation may be taken within the next few months. The East Greenville suburban line is to be discontinued at the same time. Bus service is now being given along this line between Massillon and Wooster.

The present Massillon City contract was passed in 1907. The new ordinance proposes a relief from that contract for the balance of its term. It provides that upon the discontinuance of the lines the company will relay the pavement on that portion of the street from which tracks are removed so it will be as good as the balance of pavement upon the street. All tracks abandoned will be removed in case the city decides to repave the streets.

The company agrees, under the ordinance, to relay its tracks on East Main Street from Mill to Pine and pave between tracks and 18 in. outside of each rail. Tracks on North Mill from East Main to the freight house are to be maintained unless the freight house is moved to a new location. The company also agrees to grade the unpaved portion of Wooster Avenue upon which its tracks are located between the old and the new corporation line of the city at the time service there is discontinued. All poles and wires not in use are also to be removed. Discontinuance, under the ordinance, is to be approved by the Public Utilities Commission.

The City Council of Massillon several months ago gave a bus company a franchise and it is presumed this company will operate buses into those sections of the city now served by the car lines. Buses have been getting a 10-cent fare.

The Massillon city system was constructed more than a quarter of a century ago. The East Greenville line was built a few years later, but even that line has been in operation nearly 25 years. The system never really made any money and of late years the losses have become heavier and heavier.

The Northern Ohio Power & Light Company long ago decided it would be better off without the Massillon and other non-paying lines. The company has felt, however, that it did not want to work a hardship upon the public and for that reason has delayed action until the people of that city could find some other method of transportation. It feels that method is now available.

Mississippi Interurban to Continue

At a special meeting of the Mayor and Board of Aldermen of Ellisville, Miss., an ordinance was passed repealing the ordinance accepting the proposal of the Mississippi Power Company to give the city $23,000 for permission to abandon operation of its interurban railway. At its meeting on Aug. 10 the board passed an ordinance accepting the proposal, conditioned on approval at an election which was to be held on Aug. 13, but after the proposal was withdrawn, the board, at the request of the power company, repealed the ordinance of acceptance and abandoned the selection.

Phoenix Park Sold by Jacksonville Traction Company

Sale of Phoenix Park, formerly an amusement park, by the Jacksonville Traction Company, Jacksonville, Fla., to the Asiatic Petroleum Company, Inc., for $165,000, is announced. Final details of the transaction, which has been in progress for several weeks, were discussed during a conference between representatives of the traction company and James & Paxon, local agents for the Asiatic corporation. It is understood that the Asiatic company will establish a local concentration point similar to that placed here by other large oil companies. The property consists of about 40 acres of desirable river front, easily accessible and with adequate transportation facilities.

Minnesota Road Resold

The St. Paul Southern Electric Railway, Hastings, Minn., was resold on Aug. 23 for $34,200, or $1,700 more than the price deemed too low at a previous sale by the Dakota County District Court. The purchaser was Paper, Calmenson & Company, 975 East Seventh Street, St. Paul, distributors of iron, steel and other metal products. The line will be scrapped if the Minnesota Railroad & Warehouse Commission permits.

Out of 51 bidders the competition dwindled to three. The previous bid by C. Rieger, St. Paul, which was declared by Judge Albert Johnson to be too low, was $32,500. The court will now pass upon the sale.

The St. Paul Southern has operated part of the way to St. Paul over rails of the St. Paul City Railway. Application to abandon the road was made on Aug. 13 to the state commission. The application is under advisement until arrangements are made with the St. Paul City Railway to operate cars to Inver Grove, the first station on the Southern line, a suburb of St. Paul.

A Dictator Suggested

Maurice R. Scharff finds fault with public utility management, especially fees paid to holding companies. In the *Atlantic Monthly* for September Mr. Scharff, formerly chief engineer of the Pittsburgh branch of the Byllesby Engineering & Management Corporation, discusses "The Public and Their Utilities: Finance, Engineering and Management."

He acknowledges the real accomplishment of holding companies in extending and improving public utility service, but says that "serious abuses have established themselves." A hypothetical holding company is followed in a series of suppositious transactions to financial disaster, and then he takes up such elements as the question of high fees to operating subsidiaries for managing and engineering expenses, and the other profits taken from the public utility industry through exercise of voting control, the alleged impossibility of ascertaining from the reports of holding companies the proportion of earnings received from stocks of operating subsidiaries, and the proportion from fees charged the subsidiaries, citing "the lack of any established standard for reasonable charges, the extreme variation in such charges by different controlling groups, and the obvious unreasonableness of some of the charges that are made."

Because of anticipated public condemnation of practices of this kind by the Federal Trade Commission Mr. Scharff holds the duty of the public utility industry is clear. It should "at once add to its already expensive organization a dictatorship in the integrity and independence of which the public can have absolute confidence." Under the leadership of this dictator "the industry should develop standards, in harmony with its professed ideals of public service, for reasonable charges for all kinds of services, customarily rendered by one affiliated company to another, and it should exert the full influence of the leadership of the industry either to bring the practices of all member companies into harmony with such standards, or else to cast out the companies refusing to conform, for the public condemnation and destruction which they deserve, and will no doubt receive."

Alluding to government ownership and operations, "than which no greater public calamity can be imagined," Mr. Scharff mentions three types of legislation which he thinks present themselves as possible of embodiment in state or federal statutes. Two of these types he condemns, but he seems inclined to favor prohibiting all profits on transactions between the public utility companies and affiliated non-utility companies. He thinks that regulation by Public Service Commission has suffered a "partial breakdown."

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Legal Notes

ALABAMA—*Criterion for Employment Under Workman's Compensation Law.*

Whether work being done by an employee, when injured, was reasonably necessary in proper performance of his ordinary duties, or reasonably related thereto, and done in good faith in furtherance of employer's business, is the test for determining whether the injury is one arising out of employment within the Workman's Compensation Law. An injury to a car cleaner while constructing a tool box for his own tools and clothing in the company's carpenter shop, where his duties did not require his presence, does not come within the scope of the law, particularly in view of the employer's statement that the employee could not have a locker until one became vacant. [Vickers vs. Alabama P. Co., 117 So., 650.]

CALIFORNIA — *Test of "Last Clear Chance Doctrine" Defined.*

An automobile was negligently driven into a narrow space between a parked car and a street railway track, and in this position it was struck by a trolley car. The company was held responsible under the "last clear chance doctrine." The test of this doctrine, when two persons have been guilty of negligence and one has ceased to have any power to prevent an accident, is whether the other still has the power of preventing it by the exercise of ordinary care. [Nicolai vs. P. E. R. Co., 267 P., 758.]

MASSACHUSETTS — *Unregistered Automobile Is a Nuisance on the Street.*

It is unlawful to operate an unregistered automobile upon a highway. Such a vehicle is a nuisance and an outlaw. Its operation is evidence of negligence, as a matter of law. Everything in the conduct of the operator that enters into the propulsion of the vehicle is under the ban of law. Where a trolley car collided with such an unregistered automobile, it was held that if the operation of the automobile "had any casual connection with the collision, the plaintiff cannot recover." [MacDonald vs. Boston E. R., 160 N.E., 327.]

MASSACHUSETTS — *Passenger After Alighting Struck by Overhang of Car.*

At the end of a line a passenger alighted from a car, and to avoid a puddle between the point of alighting and the sidewalk stepped near the track, where she was struck by the overhang of the car as it passed around a curve leading to the car yard. The court held she was not a passenger at the time and the company was not responsible for the accident as there was no evidence that the conductor or motorman knew, or should have known, of the danger. [Noonan vs. Boston E. R. Co., 160 N.E. 811.]

NEW JERSEY—*Duties of Street Railway Operating Under Steam Railroad Charter.*

Where a street railway operated under a steam railroad charter but did not notify the public of this fact and did not perform the duties imposed on railroad companies at highway crossings, a person attempting to cross the right-of-way of the company at a street intersection was justified in assuming that the tracks were those of a street railway company, relative to the question of contributory negligence in failing to accord the trolley car the right of way.—[Freihon vs. Public Service R. Co., 142 A., 452.]

NEW YORK—*Overpayment of Franchise Tax, Resulting From City Comptroller's Error, Held "Not Voluntary."*

A railway's right to cross a bridge was included in the value of its franchise when its tax was assessed, but the bridge tolls paid by it should have been used to reduce the tax. During one year the company overpaid because the city comptroller made a mistake in computing the tax, and the railway accepted his computation. This overpayment was held not "voluntary" in the sense that it would deprive the person from having the over-payment returned to him. [B. Q. C. & S. R. Co. et al. vs. City of New York, 229 N.Y.S., 9.]

NEW YORK — *Conditions Under Which "Last Clear Chance" Does Not Apply.*

Where a person discovers another in a position of danger in time to avoid an accident and fails to do so, he may be liable under the "last clear chance doctrine," but he is not liable because of his failure to discover the person in such a position. In this case, the motorman did all in his power to avoid an accident after discovering a person near the tracks on a bridge, but recovery could not be had on the theory that he should have discovered the situation earlier. [Wright vs. Union R., 229 N.Y. Supp., 162.]

OHIO—*City Has Power to Restrict Bus Service Within Its Territory.*

A city passed an ordinance prohibiting interurban buses carrying passengers from one point to another within the city limits without securing a permit from the City Council and no permits were granted where the route was over streets occupied by a street railway line. The validity of this ordinance was upheld by the Supreme Court. [Sylvania Buses vs. City of Toledo, 160 N.E., 675.]

OHIO—*Failure to Comply with Provisions of Law for Safeguard of Passengers Warrants Revocation of Certificate.*

Where a motor transportation company fails to comply with the provisions of the law, or the rules of the Public Utilities Commission, for the safety of the public, the commission is warranted in revoking the certificate of the company.—[Minerva-Canton T. Co., vs. P. U. Comm., of Ohio, 162 N.E., 34.]

OHIO—*Certificate May Be Revoked for Sale of Motor Bus Line Without Consent of Commission.*

After a certificate of convenience and necessity was issued to the operators of a motor bus line, their interest in it was sold to other parties without application for permission to make this sale from the commission. The power of the commission to revoke the certificate for this cause was upheld by the Supreme Court. [Oyster et al. vs. P. U. Comm., 160 N.E., 701.]

OHIO—*Hearing by Commission Necessary When Common Carrier Increases Equipment.*

The Public Utility Commission issued a certificate to operate an eighteen-passenger bus between two points. Three months later it issued a second certificate to the same operator to operate an additional bus without notice to other carriers in the same district and without public hearing. The Supreme Court held that a hearing was necessary before the certificate could be valid. [Stark E. R. Co., vs. P. U. Comm., 160 N.E., 699.]

OHIO—*Power of Public Utility Commission to Change Its Records by "Nunc Pro Tunc" Order.*

The function of a *nunc pro tunc* order is to correct a clerical error, not a mistake in judgment. It must further appear that no intervening right will be prejudiced. Hence, an order of the commission in 1927, changing to a regular certificate one which was granted in 1923 for a different kind of operation must be reversed. [Helle v. P.U. Comn. and L.S. Elec. Ry. vs. Same, (two cases) 161 N.E., 282.]

PENNSYLVANIA — *State Taking Over Highway Assumes Supervision of It.*

An electric railway agreed with a township to maintain passageway across a certain highway on which it had tracks. Later the state took over the highway. Still later, the township brought suit against the railway company to compel it to maintain the passageways, as agreed, but the court held this is a matter purely between the state and the company. [Cheltenham vs. P. R. T. Co., 141 A., 259.]

VIRGINIA—*Meaning of Right of Way at Crossings.*

A city ordinance declared that at street crossings pedestrians shall have the right of way over vehicles, except where traffic officers are stationed. This was held not to relieve pedestrians of the duty of exercising ordinary care to protect themselves from injury at such point, but in general to mean that at street intersections the drivers of vehicles shall not unreasonably impede the passage of pedestrians.—[Gordon vs. Virginia E. & P. Co., 143 S.E., 681.]

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Personal Items

Hale Holden With Southern Pacific

Hale Holden, president of the Chicago, Burlington & Quincy, will take an important executive position with the Southern Pacific Company about the first of the year. William Sproule, president of the Southern Pacific, is expected to retire from railroad service and it is accepted in railroad circles that Paul Shoup, now executive vice-president, will be his successor. Mr. Shoup is also president of the Pacific Electric Railway and second vice-president of the American Electric Railway Association.

Mr. Holden's office with the Southern Pacific in all probability will be that of vice chairman of the executive committee. This title is now held by A. D. McDonald, who is also president of the Texas & Louisiana lines of the system and will presumably retain the latter position. Henry W. deForest, chairman of the executive committee, will retain his present post.

That the president of the Burlington, which road is controlled by the Northern Pacific and Great Northern, should become an active executive officer of the Southern Pacific, evidently reflects, according to the *Wall Street Journal*, the fact that Arthur Curtiss James is a very large stockholder in the two northern lines and also in the Southern Pacific. Mr. James acquired his interest in Southern Pacific in 1924 when he and his associates turned over control of the El Paso & Southwestern, receiving in part payment $28,000,000 par value of Southern Pacific stock, and $29,400,000 bonds.

If, as the selection of Mr. Holden for one of the highest posts in the Southern Pacific organization indicates, Mr. James has begun to exert his influence in the Southern Pacific management, the latter's opposition to Western Pacific expansion may, according to the *Wall Street Journal*, be expected to subside. Railroad men are inclined to see in Mr. Holden's selection something of a peace treaty between the Northern Pacific-Great Northern-Burlington group on the one hand and the Southern Pacific interests on the other for the co-operative development of California traffic.

W. G. Fullen Resigns from New York City Commission

William G. Fullen, chief counsel for the Board of Transportation, New York City, since 1924, has resigned to enter the private practice of law as a member of the firm of Baar, Bennett & Fullen. He has been engaged in state and city service on transit matters for the past twenty years, coming to the Board of Transportation from the Transit Commission, whose chief counsel he was in 1923 and 1924. He began his service as a junior clerk in the legal division of the old Public Service Commission.

Mr. Fullen for years represented the Transit Commission and later the Board of Transportation at meetings of the Board of Estimate. He was active in assisting in the preparation of transit legislation and played an important part in preparing the city's side of the transit inquiry held three years ago by Justice John V. McAvoy. Mr. Fullen, has served under 34 commissioners and deputy-commissioners in five different forms of transit authority.

Dan Jackson on Illinois Commission

Dan Jackson, a colored Republican committeeman of the second ward of Chicago, has been appointed a member of the Illinois Commerce Commission by Gov. Len Small. Mr. Jackson succeeds Edward H. Wright, also colored, who has resigned on account of poor health. Mr. Wright was the first negro ever to be a member of the state utility commission. His resignation took place Aug. 31 and Mr. Jackson succeeded him on Sept. 1.

Changes in Division Personnel in Brooklyn

John O. Williams is the new division superintendent at the 58th Street depot of the Brooklyn City Railroad, Brooklyn, N. Y., succeeding the late William J. Roome. Mr. Williams' transfer to 58th Street depot from Halsey Street depot was announced by C. E. Morgan, vice-president and general manager. To succeed Mr. Williams at Halsey Street depot, Wallace W. Brendel was appointed division superintendent.

Mr. Williams has been a division superintendent since Nov. 15, 1924, when he was placed in charge of Halsey Street depot to succeed R. A. Masters when the latter took charge of Fresh Pond depot. Mr. Williams has worked his way up through the ranks, having started his street railway career on April 1, 1893, as a conductor on the Bushwick Avenue line.

Mr. Brendel is a new member of the group of division superintendents and a recent recruit to the B. C. R. R. operating staff. His electric railway experience, however, covers a period of twenty years. Mr. Brendel was born and reared on a farm 22 miles northwest of Indianapolis, Ind. He started in the electric railway industry on June 5, 1908, as a motorman at Anderson, Ind., on the Indiana Union Traction system. In June, 1916, he joined the staff of the Michigan Electric Railway Lines. He served as cashier and chief train dispatcher of the Grand Rapids, Holland and Chicago branch of the Michigan lines with his headquarters at Holland, Mich., for a year and then was located at Battle Creek, Mich., for three years on the Camp Custer division and later as chief train dispatcher of the southern division of the Michigan Lines. In May, 1920, he was promoted to the post of trainmaster of the southern division and the following year was made superintendent of the interurban lines of the Michigan Electric Company. He remained in the latter post until April 22, 1928, when he went to Brooklyn.

Obituary

Judge Alexander Pope Humphrey

Judge Alexander Pope Humphrey, 80 years old, dean of attorneys of Kentucky, scholar, and known nationally for his attainments in law and for his hospitality, died on Aug. 19 after an illness lasting almost two years.

Judge Humphrey was long an officer of the Louisville Railway. For nearly 60 years he had been a dominant figure before the bar of Louisville. He appeared before the Supreme Court of the United States innumerable times and numbered its justices among his intimate acquaintances. He was adept in federal law practice.

Judge Humphrey was general solicitor for the Southern Railway, vice-president and general counsel for the Kentucky & Indiana Terminal Railroad; president and general counsel for the Louisville & Jeffersonville Bridge Company; counsel for the Big Four Railroad; counsel for the Chesapeake & Ohio Railroad and until recently he was general counsel for the Louisville Railway. Three times Judge Humphrey was honored signally by the attorneys of the nation, state and city. He was elected president of the American Bar Association, the State Bar Association and the Louisville Bar Association, something said by his associates to be unusual in Louisville.

Judge Humphrey was born in Louisville, Jan. 26, 1848, the son of the Rev. Dr. Edward Porter Humphrey and Martha Ann Pope, members of pioneer Louisville families. He was educated in private schools and attended Centre College from which he was graduated in 1866 with an A.B. degree. He then attended the University of Virginia and was graduated with an LL.B. degree when he was 22 years old.

CHARLES WOODSON BATES, prominent St. Louis attorney, former city counselor and general counsel for Rolla Wells during his administration as receiver for the United Railways, St. Louis, died at Pasadena, Cal., on July 31. Mr. Bates was city counselor for St. Louis from 1902 to 1909 under Mayor Rolla Wells. He was admitted to the bar in 1885.

ROBERT H. SOUTHARD, connected with the legal staff of the Public Service Railway, Newark, N. J., died on Aug. 5. He joined the staff of the New Jersey company in 1917. Mr. Southard was graduated from Princeton in 1899, and the Columbia School of Law, in 1902. He was 50 years old.

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Manufactures and the Markets

Seattle Elevated Changes Recommended

In a recent communication to the Council, A. W. Furse, superintendent of street railway maintenance, Seattle Municipal Street Railway, Seattle, Wash., recommended that the West Seattle elevated line on Whatcom Avenue and Washington Street be abandoned and the structure on West Spokane Street connected with tracks on First Avenue South at a cost of $97,789. His recommendation was made in a recent report on the expenditures necessary to put the elevated in safe condition. He reports that the elevated is now in need of repairs and that a 100 per cent removal of ties will be necessary Oct. 1 to maintain it in safe condition. This removal will necessitate planking of tracks and other repairs to render it safe until March 1, 1929.

British Columbia Substation Improvements

Expenditure of approximately $270,000 on substation construction will be undertaken by the British Columbia Electric Railway in the immediate future, according to estimates approved by the company's officials. This amount includes about $30,000 worth of equipment which will be transferred to these jobs from stock, the balance of the amount is for construction work, and for the purchasing of new equipment for installation in the stations.

The major development is the enlarging of the existing substation at Point Grey. Two 6,000-kw. transformer banks and four high-tension oil circuit breakers together with a number of induction feeder regulators will be installed in this station. The work is estimated to cost $140,000.

It is proposed to considerably alter the appearance of the Trimble Street substation by the erection of a wall which will give the station the appearance of a suburban residence. The present 250-kw. transformers will be replaced by three 500-kw. transformers. This work will cost $13,000.

Work will also be started on the West Vancouver substation during the next few weeks. This station will be of brick construction and will cost $22,000. Considerable additions are at present being made to the Chilliwack substation. The 300-kw. rotary is at present being taken from the Chilliwack substation and erected in the Sumas substation, while a 500-kw. rotary is being installed in the Chilliwack station. This involves the expenditure of $20,000 on the Chilliwack work and $21,000 at Sumas.

Installation of a second rotary at the Bodwell Road substation is also about to be commenced by the company, and will augment the capacity of that plant. New transformer banks are being erected in the Horne Payne substation at a cost of $35,000.

Seven New Simplification Suggestions Accepted

Ray M. Hudson, assistant director in charge of the commercial standards group of the Bureau of Standards, of which the Division of Simplified Practice is a part, has just rendered a report, covering the activities for the quarter ending June 30, 1928.

In answer to the inquiry, "What's ahead for business the next six months?" as recently asked of Mr. Hudson, he said:

While I appreciate the hazards and pitfalls of prognostication, I believe this period will be marked by an increasing interest in, and application of, the principles of simplified practice. Because of keen competition, rising costs of doing business, and shrinking profit margins, both manufacturers and merchants are studying their inventories, the costs of carrying them, their relative rates of turnover, and similar pertinent factors, more intensively than heretofore. The resulting concentration of manufacturing and selling effort on stocks thus simplified is yielding tangible benefits, such as smaller inventory investments, better turnover, lower costs, better service, and better profits. Distributors, wholesale and retail, are finding they can apply sim-

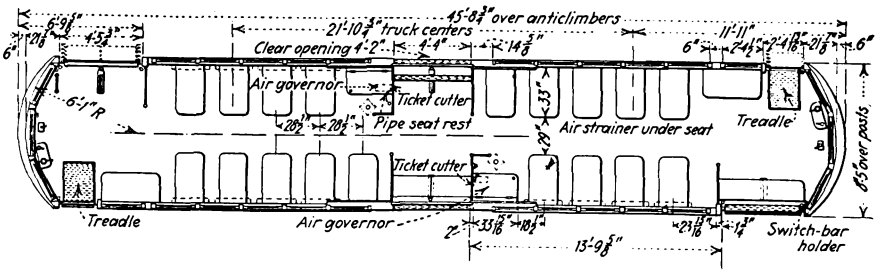
Detroit Will Receive Bids on 100 Cars

DETROIT Department of Street Railways, Detroit, Mich., will receive bids up to Sept. 13 for furnishing the city of Detroit with 50 or 100 Peter Witt type street cars, built according to the department's specifications.

Specifications on Seventeen Dallas Cars

Seventeen two-man, motor, passenger cars have been ordered by the Dallas Railway & Terminal Company, Dallas, Tex., from the St. Louis Car Company as mentioned in the Aug. 4 issue of ELECTRIC RAILWAY JOURNAL. They are of the double-end, double-truck, Peter Witt city type and seat 42 passengers, exclusive of the four Admore seats, one of which is across each side door and front door.

The cars are 45 ft. 8½ in. long, 8 ft. 5 in. wide and weigh 39,300 lb. The bodies are semi-steel construction with arch roofs and both center and end doors. The center side doors are sliding and the end doors are folding type, the rear exit doors being treadle operated. The cars are finished in green and ivory enamel with interior trim in mahogany. Each truck is equipped with two inside-hung motors and 26-in. steel wheels. Plain armature and journal bearings are used. Delivery is expected in October. Additional information is given in the accompanying specifications.



Floor plan of Dallas cars

Weights:	
Car body	19,300 lb.
Trucks	10,000 lb.
Equipment	10,000 lb.
Total	39,300 lb.
Bolster centers	21 ft. 10¾ in.
Length over all	45 ft. 8¾ in.
Length over body posts	32 ft.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 5 in.
Height, rail to trolley base	10 ft. 7½ in.
Window post spacing	28¾ in.
Body	Semi-steel
Roof	Arch
Air brakes	General Electric
Armature bearings	Plain
Axles	Heat-treated
Car signal system	Faraday buzzer
Compressors	CP 27-B
Conduit	Flexible
Control	General Electric K-35-J.J.
Couplers	Shackle bar
Curtain fixtures	Curtain Supply Company
Curtain material	Curtain Supply Company Wyndasote
Destination signs	Hunter
Door mechanism	National Pneumatic
Doors	Folding end—Sliding side
Fare boxes	Johnson
Finish	Enamel
Gears and pinions	Grade B. A-1
Glass	A A
Hand brakes	Drop handle
Hand straps	Buffalo light weight
Heaters	Consolidated double coil Truss plank
Headlights	Golden Glow
Interior trim	Mahogany
Journal bearings	Plain
Journal boxes	Cast steel—St. Louis Car Company
Motors	Four GE-265, inside hung
Painting scheme	Green & ivory
Roof material	Poplar
Sash fixtures	Curtain Supply Company
Seats	Reversible wood
Seat spacing	28½ in.
Seating material	Wood slats
Steps	Folding end—stationary side
Step treads	End "Safkar," side, Feralun
Trolley catchers	Keystone
Trolley wheels	More-Jones
Trucks	St. Louis EIB
Ventilators	Utility honey comb
Wheels, type	Steel, diameter 26 in.
Wheelguards	H.B.

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plification to their own stocks, as manufacturers have been doing for some years past, and with similar benefit.

Interest among consumer groups is also developing at a fairly rapid rate. As might be expected, industrial purchasing agents and stores department supervisors have been quick to realize on their opportunities afforded them through simplification, to more effectively control the expenditures for which they are held responsible. Several of the larger manufacturing corporations, and the railroads especially, have already made substantial savings through simplification. Its application is now spreading among the smaller firms, also among city, county, and state purchasing agents.

To Survey Purchasing Agents On Invoice Forms

A survey among members of the National Association of Purchasing Agents to determine the degree of adherence accorded simplification of commercial forms, and what per cent of invoice forms now in use conform with the simplified arrangement, has been instituted by Ray M. Hudson, assistant director in charge of the commercial standards group of the Bureau of Standards, U. S. Department of Commerce.

In discussing this phase of the simplification movement, Mr. Hudson pointed out that an investigation, concluded by a special committee of nine department heads of the Great Northern Railroad, had resulted in a $55,000 reduction in that road's expenditures for stationery. This committee, which carried on its investigation for eighteen months, examined 3,689 forms of stationery. Of this number, 379 were found to be obsolete; 651 were consolidated, and 1,980 were revised, leaving only 679 forms which were not altered. Savings were made by standardizing sizes, reducing varieties and cheapening the quality of the paper stock wherever possible.

The Western Maryland Railway, by standardizing its stationery and printing, reduced the stationery and printing bill of the road from $110,000 to $65,000 per year. As the returns from the survey being made are received from the membership of the National Association of Purchasing Agents, the Division of Simplified Practice expects to release a monthly tabulation.

Trend of Profits Upward

Profits of general business corporations for the first six months are somewhat higher than in the first six months of 1927, according to the National Bank of Commerce, New York, N. Y.

The statements now available for 310 companies show this increase to be 8 per cent. It is reduced to 6 per cent, however, when the earnings of the United States Steel and the General Motors Corporations are deducted. Of these 310 companies, 190 have had larger incomes in the past half-year than in the similar period a year ago, while 120 reported smaller earnings. Substantial increases occurred in the copper, motor and motor accessory fields and in the general miscellaneous group. Although only a small number of returns are available in the leather and rayon groups, sizable gains are also indicated in these industries.

That the second quarter of the current year registered marked improvement over the first is indicated by a comparison of each quarter with the corresponding period of 1927. The earnings of 213 industrial companies exclusive of United States Steel and General Motors were the same as last year in the first quarter, whereas in the second quarter there was an increase of 19 per cent. The number of companies reporting increases of income over the same period of 1927 was larger in the second quarter of this year than in the first.

Earnings of 32 public utility corporations during the first six months this year were 12 per cent greater than in the first half of 1927. Excluding the American Telephone & Telegraph Company, whose profits showed a 7 per cent gain, the increase of the 31 companies is raised to 16 per cent. The continued upward trend is disclosed by a comparison of the first and second quarter earnings with the corresponding periods a year ago. The second quarter's gain over 1927 was 13 per cent, compared with a gain of 11 per cent in the first quarter.

TRADE NOTES

F. C. Millhoff, formerly general sales manager of the Miller Rubber Company, New York, N. Y., for sixteen years, and more recently manager of Car & Truck Manufacturers Sales, announced his resignation from the company to take a long needed rest before announcing his new plans.

Universal Crane Company has removed its general sales office from Cleveland, Ohio, to 28th and Fulton Streets, Lorain, Ohio.

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

	Aug. 28, 1928
Metals—New York	
Copper electrolytic, cents per lb	14.54
Copper wire, cents per lb	16.625
Lead, cents per lb	6.4
Zinc, cents per lb	6.60
Tin, Straits, cents per lb	47.625
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.175
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.8
Franklin, Ill., screenings, Chicago, net tons	1.50
Central, Ill., screenings, Chicago, net tons	1.475
Kansas screenings, Kansas City, net tons	2.175
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.3
Weatherproof wire base, N.Y., cents per lb	17.125
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.1
White lead in oil (100-lb. keg), N. Y., cents per lb	13.25
Turpentine (bbl. lots), N. Y., per gal	$0.5625

National Electrical Manufacturers Association, New York, N. Y., will hold its fall meeting during the week of Oct. 29, 1928, at Briarcliff Lodge, Briarcliff, N. Y.

Linde Air Products Company, New York, N. Y., has recently completed four new plants, one at 631 South Seventeenth Street, Harrisburg, Pa., another plant at Seventeenth and West Lawrence Streets, Allentown, Pa., another at Shreveport, La., located at Foster and Thomas Streets, and another at First Avenue and B Street, South Charleston, W. Va.

Wagner Electric Corporation, St. Louis, Mo., announces the addition of Charles J. Arthur to its Philadelphia office as a salesman. Mr. Arthur was until recently sales engineer for the A. R. Amos, Jr. Company of Philadelphia.

Perfex Corporation, Milwaukee, Wis., announces that at the last directors meeting, Roger Birdsell, sales manager of the corporation, was elected to the directorate and made vice-president.

Nelson R. Brownyer, engineer-railway department of the Timken-Detroit Axle Company, Detroit, Mich., is now in Europe studying electric railway drives, brakes and other equipment in use in England and on the continent. Mr. Brownyer joined the Timken-Detroit Axle Company in November, 1926, and has been working since that time on the development of the Timken worm drive.

Eustace C. Soares, manufacturing and markets editor of *Electrical World*, resigned his position Sept. 1 to become an officer of the R. B. Engineering Corporation, 11 West 42nd Street, New York, N. Y. Mr. Soares has served on the editorial staff of *Electrical World* for nearly five years and is now returning to old associates in the consulting engineering field.

ADVERTISING LITERATURE

J. F. Prettyman & Sons wood preserving plant, Charleston, S. C., has issued four bulletins entitled, "The Foundation of Steady Service, Prettyman Creosoted Poles," "Strength-Toughness-Long Life-Prettyman Creosoted Cross Ties," "What Every Bridge Builder Should Know," and "From Order to Delivery in Sixteen Hours."

Superheater Company, New York, has issued a booklet entitled, "Steam Tables." This booklet gives the properties of saturated and superheated steam from 0.0886 to 3,300 lb. absolute pressure and includes a convenient heat-entropy diagram.

Pennrich & Company, New York, has published a booklet descriptive of Torfoleum, a heat insulating material which is at present manufactured in Europe and stocked in this country.

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See the Brill Seat Exhibit At the A.E.R.A. Convention

Delegates to the A.E.R.A. Convention are invited to the Brill Seat Exhibit, Space 120, Public Auditorium, Cleveland. An especially interesting display awaits you. See how Brill Seats are constructed!

Seat No. 301, one of many Brill Seats which will be exhibited, is well adapted for single-end cars and buses. Upholstered in plush or leather obtainable in a wide range of colors, patterns and textures and constructed with loose air and spring type cushions, it is unusually attractive and comfortable. This seat is an example of the type of seating equipment that attracts passengers.

Come to the A.E.R.A. Convention. See for yourself the construction and inbuilt supremacy of Brill Seating Equipment.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

Brill Seats Build Transportation Sales

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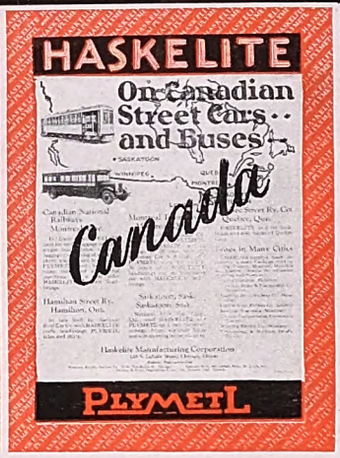
HASKELITE



Dozens of companies profit through these

light, strong panels in street cars and buses

PLYMETL

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ANNUAL CONVENTION NUMBER

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. September 8, 1928 Fifty Cents per Copy

BY ITS own achievements in co-ordinating and in bettering service, the electric railway industry has maintained its position as the leading agency of local transportation. To this industry, in its endeavor to "sell better transportation, better," General Electric offers its continued co-operation.

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

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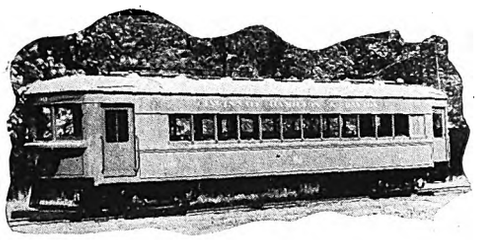
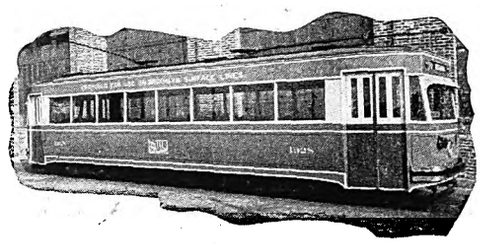


Cincinnati, Hamilton & Dayton Railway

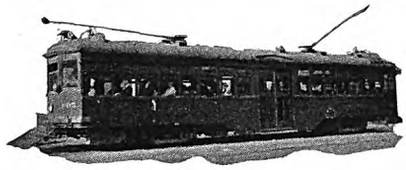


J. G. Brill 1928 Model

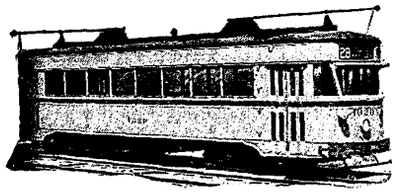
Modern Electric Cars and Coaches

— Westinghouse Equipped —

Provide Better Transportation



Pacific Electric

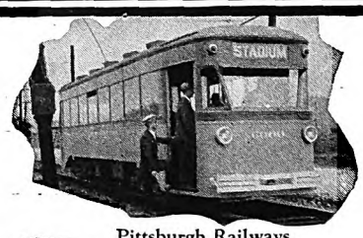


Osgood-Bradley 1929 Model

A VERY high percentage of the new and attractive types of rail and railless transportation units built during the past year for subway elevated and surface operation, use Westinghouse transportation equipment.

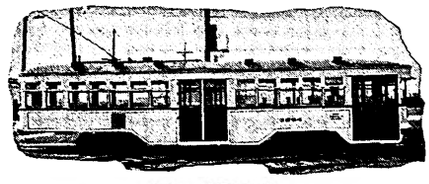
Westinghouse motors and control are especially designed to afford the ultimate in reliable operation, speed, comfort, economy and low maintenance cost.

Westinghouse Electric & Mfg. Company
East Pittsburgh Pennsylvania

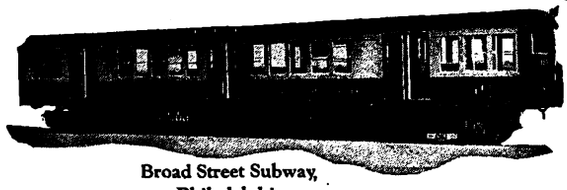


Pittsburgh Railways

Springfield Street Railway

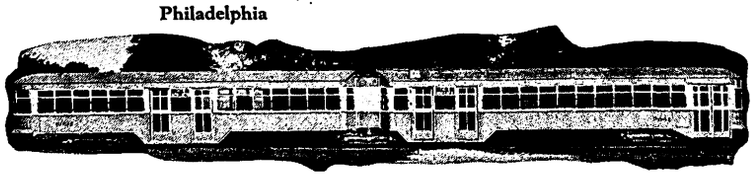


City of Detroit

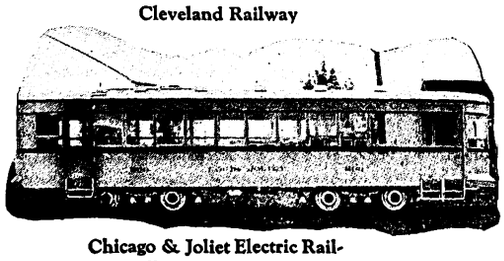


Broad Street Subway, Philadelphia

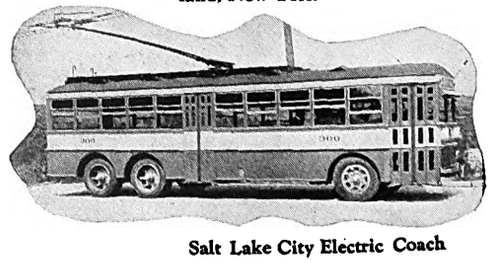
Versare Gas-electric Coaches for Albany, Montreal, Boston, Providence, Cleveland, New York



Cleveland Railway



Chicago & Joliet Electric Railway



Salt Lake City Electric Coach

Westinghouse

T 30092

1928

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

CHARLES GORDON, *Editor*

LOUIS F. STOLL,
General Manager

Volume 72 New York, Saturday, September 8, 1928 *Number 10*

Annual Convention Number

Selling *Better Transportation* Better

"SELLING BETTER TRANSPORTATION BETTER" expresses the keynote of the industry's present thinking. Last year the theme was "Meeting the Demand for Better Transportation." Two years ago it was "Making Transportation Pay." In this development of thought there has been progress from the general discussion of difficulties to the formulation of specific suggestions for overcoming them. Long since, the industry recognized the *why* of its difficulties. Today, it understands thoroughly the need for improvement of its service. It is now trying to learn *how* to meet the changed conditions which it has been called upon to face.

Theoretically a monopoly, and subject to regulation as a monopoly, transportation today, because of the widespread ownership of the automobile, is a highly competitive business. The industry has come to realize, therefore, the need for adopting the methods of competitive merchandising to the sale of its product—transportation. This process divides itself into two principal phases; first, continuation of the effort to develop and improve its service, and, second, more intensive promotion of the use of public transportation through modern selling methods.

Improved service is made up of many elements. New cars alone are not the only requirement. Smooth track alone will not suffice. Regularity, speed and frequency of service, though exceedingly important in themselves, must be accompanied by convenience, comfort and courtesy. All these factors and many more go to make up the character of the service; they are necessary in the development of better transportation. Each of them, furthermore, may be broken down into many parts. It is not enough to have new cars; they must be better cars—cars that will look better, ride better, run quieter, accelerate faster, stop smoother, and cost less to operate.

SIMILARLY, better selling comprises the collective results of several forms of activity, all more or less new to the public transportation business. It is not enough that employees be well trained in handling equipment and in the efficient discharge of their routine duties; they must be trained, as well, in dealing with the public on a new

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basis. Then there is the price at which the product is sold. This is recognized among transportation men as an increasingly important factor in selling.

The need for a really scientific fare structure is occupying serious attention. Finally comes market analysis, the most recent question to be injected into this discussion. It involves the determination of the travel habits of present patrons, and of those who do not use public transportation service. Its purpose is to discover the reasons for loss of business, the potential sources of new business, and the measures needed to increase the number of riders on public transportation vehicles.

DESPITE the growing realization on their part of the need for meeting automobile competition by improvement of service and merchandising effort, transportation men have as yet failed fully to recognize the great opportunity which is opened to them by growing traffic congestion. To sit back while the community vainly struggles to find a solution, or merely to foster measures which will restrict the individual vehicle and force more people to use public transportation service is a negative attitude. And a negative attitude usually is harmful.

Intelligent merchandising dictates that a definite effort be made to assist public officials in working out sound transportation and traffic policies in the best interest of the present and future development of their communities. The suggestion of doing away with street cars on the ground that they are out of date and interfere with other traffic comes mostly in localities where the management has failed to recognize the need for keeping pace with the times or where it has been hopelessly handicapped by arbitrary fare restrictions, by unwise traffic regulations or by a hostile public.

APPROXIMATELY 75 per cent of those who travel in the larger centers of population still use public transportation service. This proportion decreases as the size of the community decreases, until it reaches about 50 per cent in the smaller cities. The variation is attributable to the relatively greater inadequacy of the street space in the large community compared with the smaller city. In the larger cities, also, fewer people can afford to use individual cars. Inadequacy of available street space has made the way easy for bringing to the attention of the public and of public officials the necessity for giving preference to the majority who travel in public conveyances. Even the retail merchant, whose primary interest is that of making it convenient for the greatest possible number of people to reach his store, can be brought to realize the need for the restriction of parking. The parked car in congested areas keeps away more customers than it brings. And this has been abundantly proved to the retail merchant whenever he has consented to an impartial study of the facts.

Transportation men know that it would be fatal to attempt to dispense with the public transportation vehicle. They know that street widening is enormously expensive. They know that the provision of additional space for individual vehicles serves only comparatively few people at excessive cost to the city. Too few of them, however, have succeeded in improving the quality of their service sufficiently to increase its popularity. But by that means only may they expect to win public approval for those measures that are necessary to permit public transportation to fill its rightful place in urban life.

PUBLIC recognition of the economic advantages to the community of organized mass travel will follow only as the companies succeed in the present effort to make their service attractive and popular. To that end, this issue of the JOURNAL is dedicated. It presents a series of articles which search deeply into the many phases of local transportation management and operation. They are written by men who have helped to bring about the changes in methods which have made it possible for many companies successfully to meet new conditions. Better selling and better service are approached from many angles—teamwork, safety, convenience, friendliness, advertising, car improvement, traffic regulation, use of the bus, the trackless trolley, rate making, track, power and maintenance—all considered from the standpoint of building revenue. The human as well as the material factors in transportation service are considered.

Taken as a whole, this issue of ELECTRIC RAILWAY JOURNAL represents a climax to several years of rapid change in the point of view of transportation executives. Its purpose is to help the men of the industry to broaden their conception of the part played by each department in the task of selling better transportation better.

Charles Gordon

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The Need for

Public Transportation

Is Assured

BY

R. P. STEVENS

President
American Electric Railway Association

R. P. Stevens

"WHERE there is a will there is a way" was never more clearly demonstrated than in the local transportation industry at the present time. The immediate past was more or less shrouded in uncertainty and we have been groping in the dark, due to lack of experience in dealing with the fundamental changes in the conditions which we have been called upon to meet. These changes have followed a long succession of economic problems that all but engulfed us in an avalanche of seemingly insurmountable difficulties.

We had permitted ourselves complacently to accept the principle of a fixed rate of fare. We had with short foresight stood by while more and more arbitrary and inflexible provisions were written into street railway franchises. We failed to see the danger in the steady spread of city boundaries, with a resulting increased average length of lines for a given fare. We kept to our own councils; we gave little attention to the public except to make sure it paid its fare, and we assumed that with the right to lay our tracks in the street we had acquired competition-free assurance of regular dividends without the need for any further attention to the public's views or opinions. All of these dangerous conditions were permitted to grow up in our industry. We failed to recognize the difficulties ahead until we found ourselves bound by them when we were called upon suddenly to face skyrocketing labor and material costs and increased taxes. Then, when we turned to the public for relief, we discovered, all too late, the high cost of our former aloofness.

Then what did we do? We trimmed costs and then trimmed them again to meet the rise in every column of our books except income. We curtailed service and permitted our properties to depreciate. We began to talk poor and to look poor, while again failing to recognize another and an even greater menace growing all about us—competition! The automobile grew from a mechanical novelty to a practical, low-priced, fleet and attractive means of transportation. Before we realized its full possibilities we found ourselves, already impoverished and handicapped by awkward and inflexible franchises, beset by a literal swarm of irresponsible jitneys. No sooner had some relief been obtained from that plague, than the jitney grew to a more pretentious vehicle and took form as a bus.

Is there any wonder that many electric railways found themselves in desperate circumstances and that some executives were bewildered in contemplating the future? The most impressive fact that stands out of all this is that the industry survived at all! Only an industry which supplies

EXPERIENCE during the past decade has proved that there is an undiminished need for public transportation. Many obstacles that seemed insurmountable have been overcome. There remains ahead the task of meeting with more attractive service and more intensive merchandising the changed conditions that have been brought about by the private automobile.

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a basic necessity to the life of the community could have survived this unprecedented and cumulative series of economic and operating difficulties. The outline here suggested falls far short of reciting all of them; street traffic congestion added another trouble and the loss of credit in turn made physical improvement of run-down properties extremely difficult.

But despite all of these things, what is the situation today? The industry has faced about. It has stopped pleading poverty and has started to merchandise the value of its service. It is gradually re-winning public confidence and is endeavoring to adjust its service and the point of view of its personnel to meet the changed conditions as it finds them. The fixed 5-cent fare has been shaken off in practically all important cities except New York, which was also one of the last to abandon horse cars. Service-at-cost franchises with indeterminate terms are rapidly taking the place of former inflexible grants that strangled development and adjustment to changed conditions. The jitney is practically extinct and the bus has become a complement to the industry instead of a destructive competitor. All of this has taken place within only a few years, and yet there are some who question the future of the local transportation industry!

IS THERE any wonder that many electric railways found themselves in desperate circumstances and that some executives were bewildered in contemplating the future? The most impressive fact that stands out of all this is that the industry survived at all! Only an industry which supplies a basic necessity to the life of the community could have survived this unprecedented, cumulative series of economic and operating difficulties.

This issue of the JOURNAL is devoted to the general subject of "Selling better transportation better." That is a happy way of expressing the great pressing job before the industry today; the final phase of its metamorphosis that must be worked out before the full significance of the great change which is taking place in the status of the industry will become apparent to the casual observer. The job is only started when street cars are made available to the public, the fare collected and a proper accounting made. The immediate task before us is to provide better facilities than we have ever had before. The day has passed when we can afford to let the public take the entire initiative in using these facilities.

Today the local transportation industry must go much further. It must offer a service that will attract passengers in competition with other forms of transportation and that will deliver them to their destinations under conditions that will cause them to want to use our service again whenever they have occasion to travel and even when they have a choice of several agencies. We must go even further. The advantages of this service must be kept constantly before the public, through every available means of contact; through the man on the platform, through advertising and other forms of sales promotion, and through the part which the transportation company plays and the reputation which it establishes in the community.

We are in the midst of an intense merchandising era. On every hand, business is engaged in creating a demand for its products. In the past we assumed that we were immune to the need for stimulating business. We were content to accept only that patronage which was offered voluntarily or because certain people had no other means of getting about. Consequently our patronage became limited largely to necessity riding only. While the habit of moving about grew from year to year with the improvement of the automobile, our most profitable class of business—that in the non-rush periods—dwindled, while rush-hour volume grew with increases in population and industrial activity. Continuation of this trend over several years gives us now an exceedingly inefficient load factor and an income overly sensitive to slight changes in industrial activity.

Summarized then, there is no mystery about the causes of the difficulties under which the local transportation industry has been laboring during this past decade. Many of these causes, particularly the fundamental difficulties of inflexible fares and franchises, public distrust and unfriendliness, have been removed. The industry is on a more secure foundation than ever before and today faces the one great remaining problem of adjusting its point of view and its methods to meet the changed conditions under which it is required to do business. The essential nature of the service rendered by the street car has been repeatedly demonstrated, and community after community that was misled into the assumption that the usefulness of the electric railway was ended, has been glad to make many concessions to get street cars back again.

There is a very definite and pronouncedly favorable trend on the part of the public toward electric railway transportation. The growing problem of street congestion is causing people to see more clearly the economic importance of the part played by public transportation facilities. Witness the situation in Cincinnati, for instance, where street car traffic increased 7,500,000 passengers in 1927, compared with 1926. Witness conditions in almost any medium-size city, where the newspapers a few years ago were declaring that the day of the street car was gone, but where they now are objecting to the discontinuance or curtailment of street car service and are declaring, quite properly, that the services rendered by the electric railways are necessary, essential, indispensable.

It is our responsibility to keep the facts before the public. We can expect the necessary co-operation in working out the current problems of local transportation only when the public has a full understanding of the situation. We can expect co-operation from public officials only if it is backed by the people themselves. But there are examples from the stern school of experience that give increasing evidence of the secure foundation of public necessity upon which our industry rests. Phoenix, Ariz., with 26,000 population found that electric railway transportation could not be dispensed with. After having failed to understand the need for co-operation with a private company, the city itself was forced to provide this service when the private company gave up the effort to win out under impossible conditions. Ashtabula, Ohio; Athol, Mass., with only 10,000 people; Greenfield in the same state, with a population of only 15,500, and many other cities furnish examples not only of medium-size communities, but of smaller cities as well, that after trying to get along without street railway transportation

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were ultimately compelled to provide these facilities themselves at an increased cost.

The trend toward higher fares has been definite, but that is only one of the ways in which communities can and will co-operate to permit us to give better service, providing that we do our full part in the improvement of facilities and in putting the facts of the situation clearly before the people. Many forms of indirect taxes on the car rider, and many unnecessary service requirements founded upon customs and practices of the past can and should be eliminated.

So it seems to me that there is good ground for optimism regarding the outlook for the local transportation industry. There is, however, no ground for self-complacency or for unwise over-confidence. The automobile has taught the public that it is possible to move swiftly, comfortably and conveniently, and a public accustomed to that kind of transportation will not accept the brand of public transportation that we were giving a decade ago, and that some of us are still giving today. That is why the industry is today concentrating its primary attention upon modernization, not alone of equipment, but of its point of view and its methods of conducting its business.

THE improvement of our product and application of merchandising methods are the two great problems before us today. We have much to learn, but the will to learn is half the battle. I am satisfied that the industry has the necessary determination.—I look forward to its future, therefore, with the utmost confidence.

We have a better balanced and practical view of the bus question. We have stopped deluding ourselves about a mystic rubber urge, and are figuring closely what business we should attempt to handle with buses and where the street car is more advantageous. The bus no longer represents a serious problem or a threat to existing local transportation. We know more about its limitations as well as its advantages than we did even a couple of years ago. It has been adequately demonstrated that this new vehicle serves best and functions most advantageously when it is co-ordinated with existing transportation agencies.

All of this is in the direction of progress, and it all places our industry upon a more secure foundation than it has been in years. The path ahead is clearer than it has been at any time within a decade, and we have found the way through or over the many obstacles that seemed for a time to be insurmountable and that threatened destruction. The continued need for public transportation has been demonstrated by its ability to surmount these many difficulties which would long ago have completely wrecked a less essential industry. But though the path ahead is clearer it leads through the strange fields of competition and merchandising. The industry faces the very definite responsibility of fitting itself to meet these new conditions.

We must go further than merely to provide what in our opinion is good service. We must provide a class of service that will attract patronage and hold its own in attractiveness, price considered, of course, in comparison with other available forms of transportation. That means that we must improve the appearance and performance of our equipment. It has been said many times that our cars constitute our place of business, and that the public will not permanently tolerate anything which has the earmarks of obsolescence. It may be true that many of our existing cars are sturdy and serviceable. But by comparison with sleek, quiet, racy-looking automobiles they are out of style and reminiscent of pre-flapper days. Being out of date the public considers them no longer useful. Therefore an immediate task before us is to build modern-looking cars. In carrying out that task we have been slow. It is to that job therefore that we must bend our energy if we are to take full advantage of the opportunity that exists for the industry.

During the past two years much has been accomplished in changing our conception of the proper appearance and performance of a street car. Many of the designs that we considered freakish at last year's convention seem quite the thing today, and we are looking forward to still further departures from our old ideas at this coming convention. This is one of the most promising of the trends during the year. In some instances operating companies, impatient to find a type of car that would meet the demand of the times, have taken the initiative in experimental work to find out the practical limitations in suggested new ideas.

The primary responsibility of equipment development rests with the manufacturers. But upon the operating companies there is an equal responsibility for encouraging and supporting this needed activity. There is reason to believe that the interest in new design ideas has so slowed up buying of equipment of more conventional and proved designs as to have brought about a very critical trade situation which threatens to check the very developments in which we are interested. Replacements of obsolete and inefficient cars are lagging. The number of new cars purchased each year has been steadily decreasing for several years. The industry is paying a heavy price in excessive operating costs for cars that have long ago outlived their economic usefulness. Properties that have proceeded with replacement of obsolete equipment, using cars of more or less conventional type, but of lighter weight, greater comfort, more efficient equipment and higher speed, have almost universally found the investment more than justified, and have effected savings that prove that the rest of the industry is paying a heavy price for its delay in car buying. This year the committee on electric railway finance has opened the door toward easier terms for new car purchases so that cars may be financed out of earnings and may be paid for out of the actual savings which they effect. It is imperative that we proceed with the improvement of equipment in service. A serious situation will be created if we continue to postpone needed replacements.

Just as we are still in the process of working out types of cars to meet the changed conditions under which our business must be conducted, so also are we endeavoring to revise our methods of conducting our business by applying sales promotion ideas to increase patronage. This improvement of our product and application of merchandising methods are the two great problems before us today. We have much to learn, but the will to learn is half the battle. I am satisfied that the industry has the necessary determination. It has in the past mastered far more difficult and more discouraging problems and has survived. I look forward to its future, therefore, with the utmost confidence.

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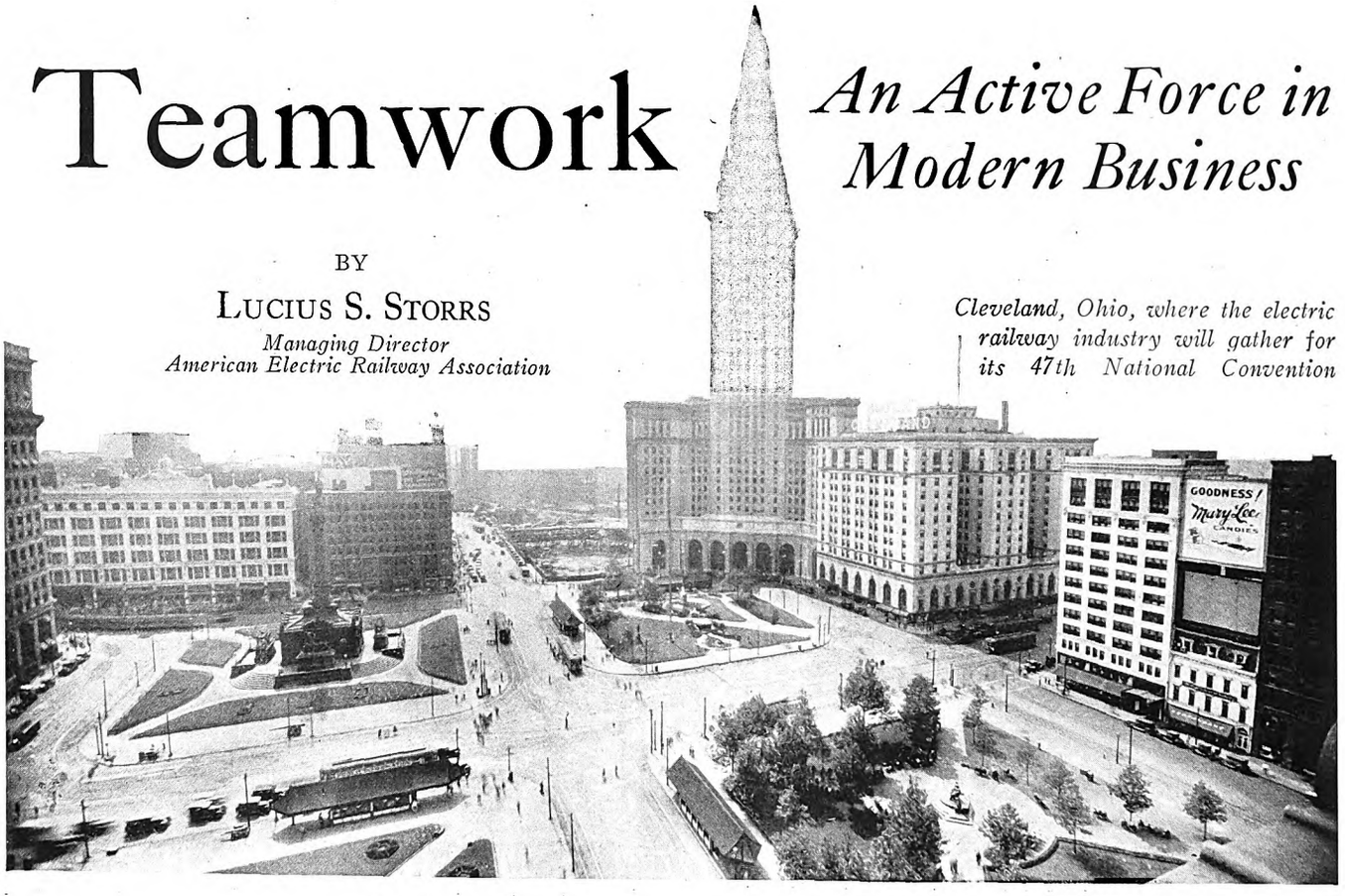
Teamwork

An Active Force in Modern Business

BY

LUCIUS S. STORRS

Managing Director
American Electric Railway Association



Cleveland, Ohio, where the electric railway industry will gather for its 47th National Convention

Steering out of familiar channels into the wide expanse of merchandising activity, the transportation industry has greater need than ever before for collective thinking

IN BUSINESS today, as never before, the power of teamwork is being recognized. American business rapidly is passing completely out of its former status, where the effort of a single individual determined the success or failure of a given enterprise. The vast power of organized effort has been demonstrated in America, and the rapid strides which have made American enterprise and business accomplishment the wonder of the entire world are entirely attributable to the substitution of organized effort for individual endeavor. Even in the last great stronghold of individual enterprise—retail trade—the chain store has become established. It represents the final extension of the organization for the individual and completes the cycle throughout the entire range of raw material production, manufacture and distribution.

American business today is entering or has entered upon what might be considered its second great phase of development. The first phase, that outlined above, might be termed the substitution of organization for individual enterprise in a particular business undertaking. There the power of the team over the individual has been more than demonstrated. The second great phase is represented by teamwork within an entire industry. Just as a well-organized team has shown its ability to outdistance the individual in any given business enterprise, so can the various companies within an industry find themselves in a better position to advance their own interests, by associating themselves for the advancement of the industry of which they are a part. Here again, teamwork—the most vital force in American business today—is showing its power.

The individual electric railway management finds itself at this stage of the industry's progress emerging from a decade of heroic struggle against what seemed to many to be overpowering odds. Some of the difficulties which arose and some of the problems that had to be met seem to have been almost inevitable, growing out of changed economic conditions, and beyond the power of human foresight to anticipate. But the burden which each management was called upon to carry individually could probably have been relieved had there been closer contacts between individual groups within the industry and a greater tendency to profit from the other fellow's experience, and to co-operate in attacking jointly problems common to many individual companies. Situations which developed first in one section of the country were of little interest to many railways in other sections until they themselves were engulfed in a great common situation which had swept the entire country. A little more co-operative thinking, a little more teamwork, in the early stages of some of these problems might have saved many electric railways untold cost and difficulty later. In some instances managements have been content to attack some of these situations individually when they were encountered, instead of availing themselves of the experience of other railways. Certain franchise situations, rate structure cases, the jitney, the one-man car and the motor bus are examples of the many common problems in which greater collective effort and more teamwork would have worked to the advantage of the entire industry.

All this is not to say or even to intimate that the industry has failed entirely to get together for the attack of common problems or for the exchange of information. In fact, one of the most constructive tendencies of recent years has been the growing inclination on the part

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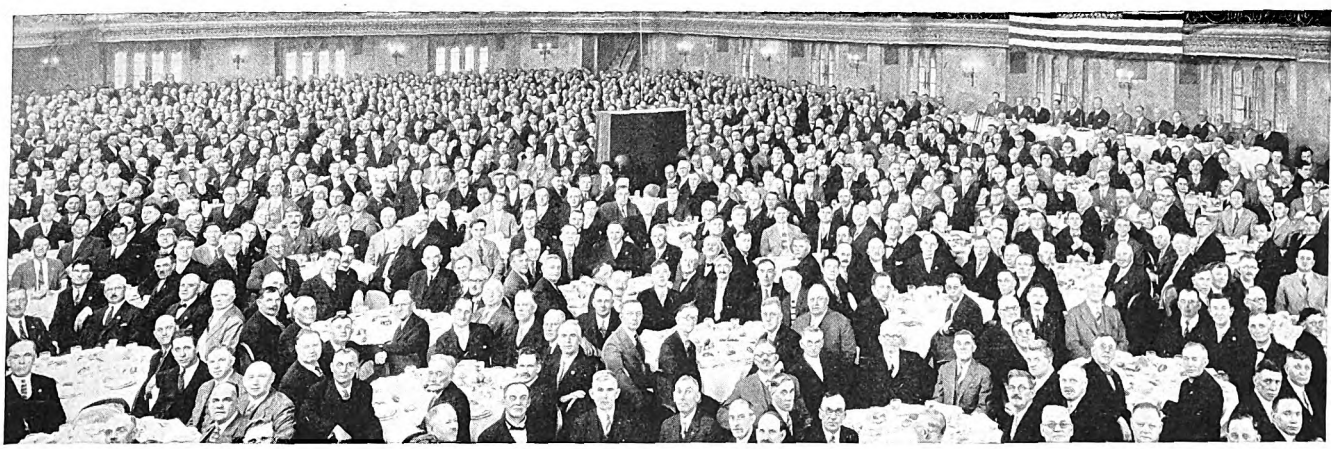


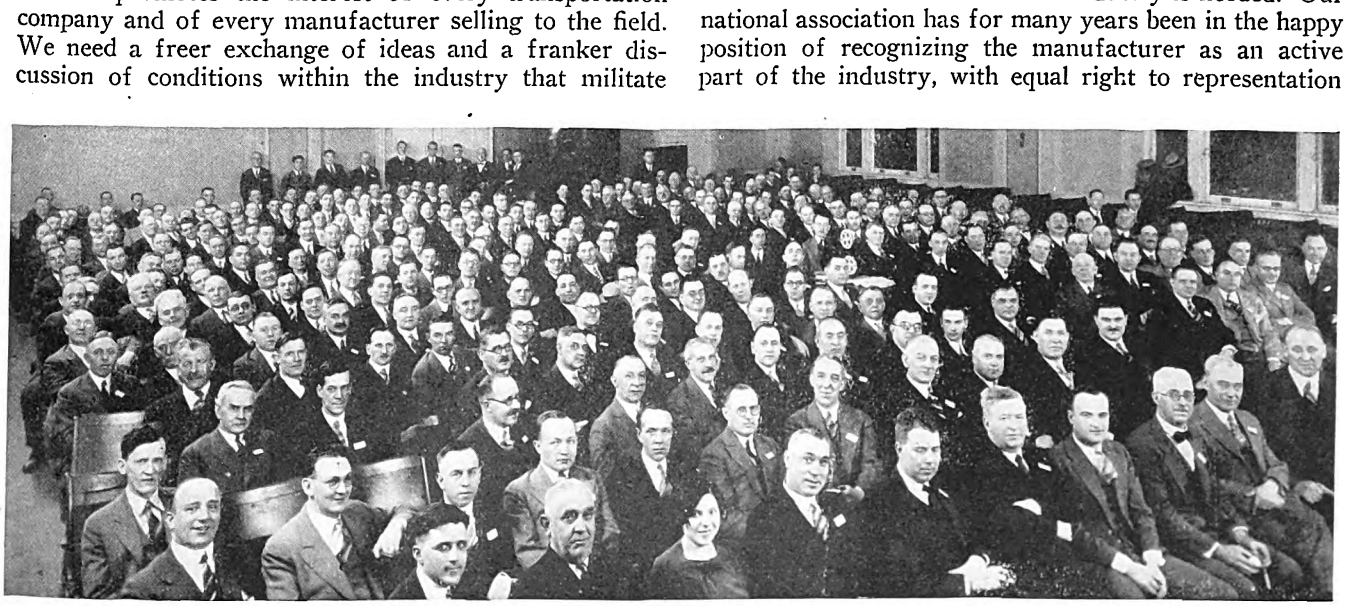
Accident prevention banquet of the Chicago Surface Lines, held at the Hotel Stevens on May 3 of this year. Company gatherings of this kind create and further the spirit of teamwork, so necessary among all departments and all ranks

of progressive managements not only to send their principal executives to visit other companies for the comparison of practices, and to committee meetings and conventions for the interchange of ideas, but also to send department heads and minor executives beyond the confines of their individual jobs to get a fresh point of view and a broader perspective of their work. The growth of interest in the annual convention, the increased participation in committee work and the development of sectional associations and organizations directed to the improvement of the work of a given department, like the Association of Equipment Men, Southern Properties, are all evidences of this greater interest in getting a broader point of view, in the exchange of experience and in the collective attack on common problems.

Teamwork, which has been so vital a force in all business as we know it today, is needed to a greater degree than ever in the transportation industry. Our industry might well adopt as its own the slogan of the last annual meeting of the National Chamber of Commerce in Washington—"Teamwork for Prosperity." We need more teamwork, not only among the electric railways, but also among the manufacturers serving the industry and between the operator and the manufacturer. We need a keener realization that promotion of the industry's welfare promotes the interest of every transportation company and of every manufacturer selling to the field. We need a freer exchange of ideas and a franker discussion of conditions within the industry that militate against its progress. We need greater participation by individual managements in the collective attack which is made through the association on national problems, which though they affect every operator and every manufacturer, are so broad in their scope that they cannot be coped with effectively by any single company.

If managements do not show their interest in the improvement of cars and buses through whole-hearted co-operation in experimental work, developments direly needed by the entire industry are bound to lag. Unless railways in need of new equipment proceed with purchases instead of waiting the executives of the manufacturing enterprises will find their volume of business in the electric railway field shrinking to the danger point and will draw tight the purse strings on the very developments which the industry needs so badly and upon which all other service improvement and merchandising activity is contingent. On the other hand, those manufacturers who are content to sit back while the other fellow spends the money and carries the burden, are following a policy inimical to the industry's best interests and to their own part in its future progress. They face an inevitable loss in recognition, prestige and volume of business in the field.

More frank discussion of the conditions under which business is carried on within the industry is needed. Our national association has for many years been in the happy position of recognizing the manufacturer as an active part of the industry, with equal right to representation



Transportation companies serving more than 7,000,000 people in and near New York City are represented in the Metropolitan Section of the A.E.R.A. The meetings of this section are made interesting and valuable by carefully-prepared programs

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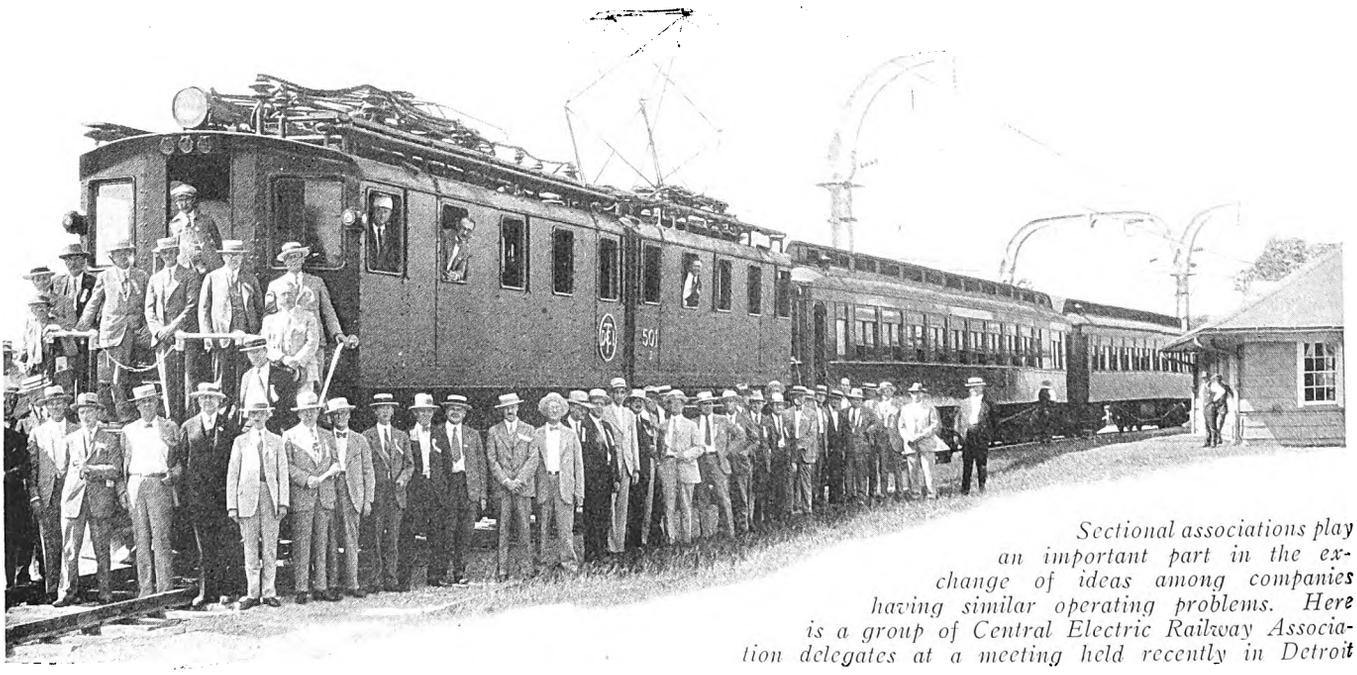
on its executive committee. This is unquestionably a wise policy and makes it possible for the kind of co-operation and teamwork which is needed. But there has been an absence of the frank discussion of trade conditions within the industry that concern the manufacturer as the seller of products which the operators buy and must have. No one manufacturer can afford to jeopardize his trade relations by taking issue with practices of his customers, even though he knows them to be inimical to the industry's best interests. But through collective action in committees and through the association's executive committee the manufacturer has a voice and should utilize the opportunity which is given to help in pointing out the way toward progress.

Considering now the work of the American Association and its affiliated bodies, we have all of the organization and mechanism needed for effective teamwork. Great strides in the solution of various phases of the transportation problem have been made by individual railways, but few, if any, of them have adopted all the measures which have proved effective in meeting present-day conditions. In other words, great progress has been made throughout the transportation industry in working out ways to increase revenue or reduce costs, but the adoption of ideas which have proved successful on one property to the many properties where they would likewise prove beneficial has at best been slow. Perhaps local pride is in some instances accountable. But one needs only to peruse the pages of the industry's technical press, or the briefs filed annually in the Coffin Award contest, to realize the great inertia which holds back the application of improvement methods which have already proved successful on one or more properties. It is through contacts in association committees, discussions at meetings and conventions that a strong stimulus toward the spread of progressive practices is obtained.

The problems before the industry have been so complex and so baffling that many minds are needed to find the solutions. Association activity provides the groundwork for this collective thinking. But it goes further. Behind the day-to-day problems of the individual property are broad economic trends of which the conditions encountered on the individual property are merely a phase. Analysis of the statistics of the industry as a whole provides a reference point from which to judge the trends in any given locality. The collection and analysis of these general statistics and the study of these broad economic trends are usually beyond the resources of the individual management, pressed as it is with the mass of problems incident to daily operation. Group activity and teamwork make it possible to follow these broad economic changes and to make the information available for the guidance of each individual management.

There is another element in teamwork that is sometimes overlooked, and that is the spirit and courage that is developed through association in a mutual enterprise. In athletics, team spirit, pride and courage frequently achieve amazing results under seemingly impossible handicaps. Likewise this is true in business. In the local transportation business changes have been coming so fast and the departures which are demanded from more than 40 years of precedent are so wide and in some instances so radical that collective action, the power of example and the spirit of teamwork engendered by mutual interest in a great common undertaking, are essential to effective progress.



Sectional associations play an important part in the exchange of ideas among companies having similar operating problems. Here is a group of Central Electric Railway Association delegates at a meeting held recently in Detroit

Now that the industry is committed to the wide and—to the transportation man—uncharted sea of merchandising, the need for teamwork is greater than ever before. We are undergoing a complete change in point of view and in our conception of the nature of the business in which we are engaged. As we steer our course out of the familiar channels of operation into the wide expanse of merchandising activity we have need for greater collective thinking than ever before; need for the freer exchange of experience; for greater co-operation and for more of the spirit of teamwork in the attack on great common problems. Let us take this theme of "Selling Better Transportation Better" as our business objective. Let us concentrate on understanding better the concrete application to the transportation business of the many measures which it demands in our daily operations. Then let us unite in a great co-operative drive toward the solution of our common problems, and all the burdens of the past or the future cannot prevent us from achieving for our industry its rightful place in the sun.

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This sign, at the Michigan Central Station in Detroit, calls the attention of all persons leaving the station to the direct service to the hotel district given by the street cars and buses

Smoothing the Way for the RIDE PROSPECT

STIMULATING signs, clear route indications, timetables, loading platforms and convenient fare schedules are among the many car and bus rider aids that assist in selling the service

"ONE-THIRD of the traffic is the daily, compulsory movement between home and job; one-third comes from fairly frequent shoppers and theater-goers; the remaining third is 'the movement of the human anthill,' that spur-of-the-moment travel which is made by the occasion or the weather." Frank Pick, managing director of the London Underground Railways, so summarized conditions in a paper on London traffic some years ago.

Research by experts in American travel data, indicates that not much more than one-third of the travel in cities of 100,000 or greater is of the compulsory kind. This deduction comes from studies of the weekly pass and permit card, both of which are intended to segregate the patrons who have a daily riding habit as a matter of necessity.

The casual or unstable proportion of our patronage averages between 20 and 30 per cent of the total, so it is evident that we have a large dividend-meaning fraction to deal with. These are the people who need our service least, and therefore require persuasion most. The regular rider may know all about the service, but not so with the auto-owning woman who hasn't been on the trolley for weeks and who is indignantly unaware of the fact that blue-front cars load at the front or that the route marker for the Gimlet Avenue line is an "E" instead of the expected "G." Why should we expect our arbitrary designations to remain in the memory of a public distracted by new sensations every day?

Let us analyze briefly what means can be taken and are being taken on at least some properties to smooth the way for the ride prospect.

How to Reach a Car

If he is a stranger arriving by railroad, his first thought is how to reach the street car and which one will carry him to his destination. The first question may be answered by signs, as in Denver or Detroit. The Denver

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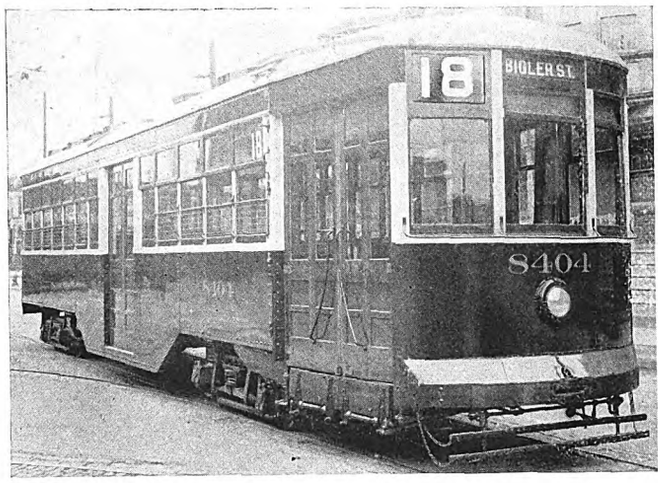
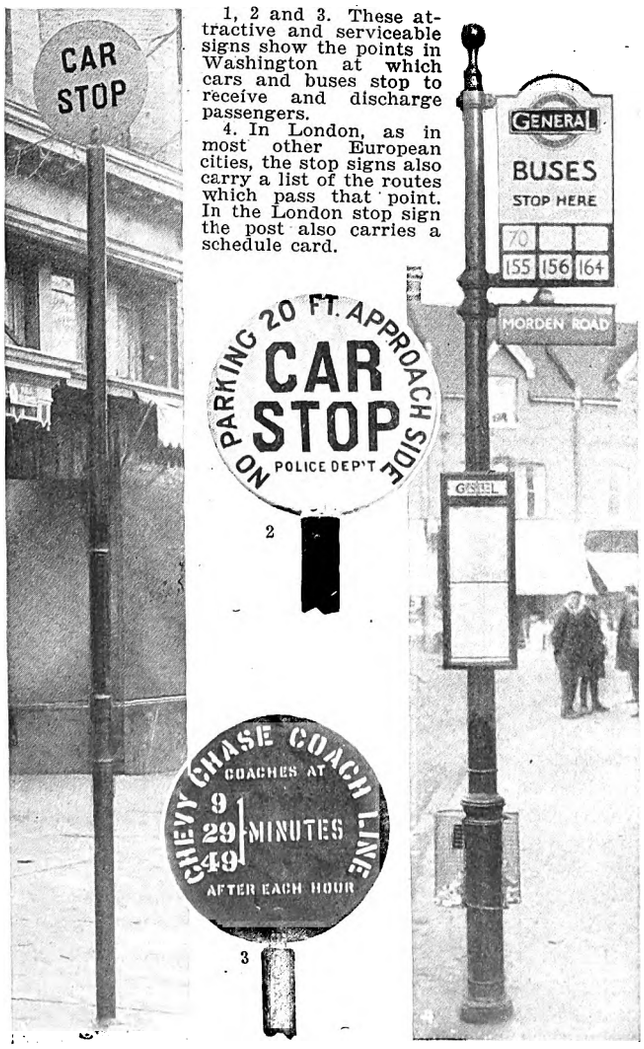


In Philadelphia the route name is carried at the top of the center vestibule sash, and the route number both on the side vestibule sash and in the upper side sash of the car

sign is 16x4 ft., and the lettering is of opal glass. It is placed at an elevation of 20 ft. directly in front of the passenger exit at the Union Station in Denver, a point from which street cars or tracks are not visible. The illustration on page 377 shows the sign at night when it is illuminated.

The Detroit signs illustrated are at the Michigan Central Depot. Here the signs "To the Street Cars" are posted where they first meet the eye of the traveler.



1, 2 and 3. These attractive and serviceable signs show the points in Washington at which cars and buses stop to receive and discharge passengers.

4. In London, as in most other European cities, the stop signs also carry a list of the routes which pass that point. In the London stop sign the post also carries a schedule card.

Then as he emerges from the station, his attention is attracted by the illuminated sign, an illustration of which is shown at the head of this article, which mentions the destinations of the cars and buses and the rates of fare on each.

Other companies find the possibilities of securing traffic at railroad stations so great as to warrant them in having a representative there to direct passengers to the cars, at least part of the time. This practice is followed at Allentown, Pa., by the Lehigh Valley Transit Company.. As railroad passengers arrive the "greeter" calls

Notices in service and fare changes

Where cars have to be temporarily rerouted in Boston, they carry a short or diverted route sign like that shown at the left.

The poster at the right is a notice on fares carried in Baltimore cars for some time after a change in fare schedules.

their attention to the fact that such and such a street car is waiting outside. He also acts as a bureau of information, answering queries concerning the streets and principal buildings. He explains how to reach various points in the city by street car and also answers questions about interurban schedules.

Possibilities on the dissemination of schedule information by American electric railway companies have not been confined to signs and "greeters" at railroad stations. The more common means of supplying this information where it is most needed are information booths, maps and time-tables. The maps and time-tables can be posted or issued in small size and distributed.

Information booths have long been a feature at Kansas City, where the local authorities gave the railway company permission to place such booths on the sidewalks of downtown streets. Railway companies in some other cities install and man information booths at times when large numbers of strangers are expected in the city, as during conventions. This is the practice in Birmingham where the booth attendants wear neat uniforms with "Street Car Information" lettered in gold braid on their caps.

The plan of posting and issuing maps and giving out time-tables of the lines is followed more generally. Where large scale maps are used, they usually are framed and distributed to hotels for display in their lobbies, to railroads to be hung in the railroad stations, to the Y.M.C.A., Chamber of Commerce, etc., where they can be consulted. It is customary in such cases to mark in red the point where the map is displayed, so the stranger can quickly orient himself and then see where the nearest car line is which will take him to his destination.

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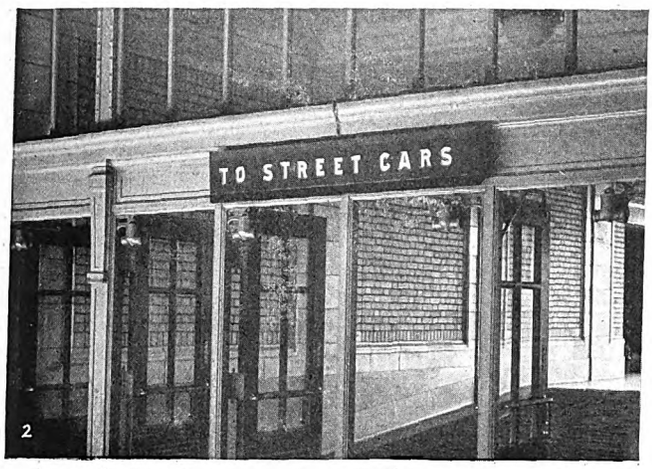

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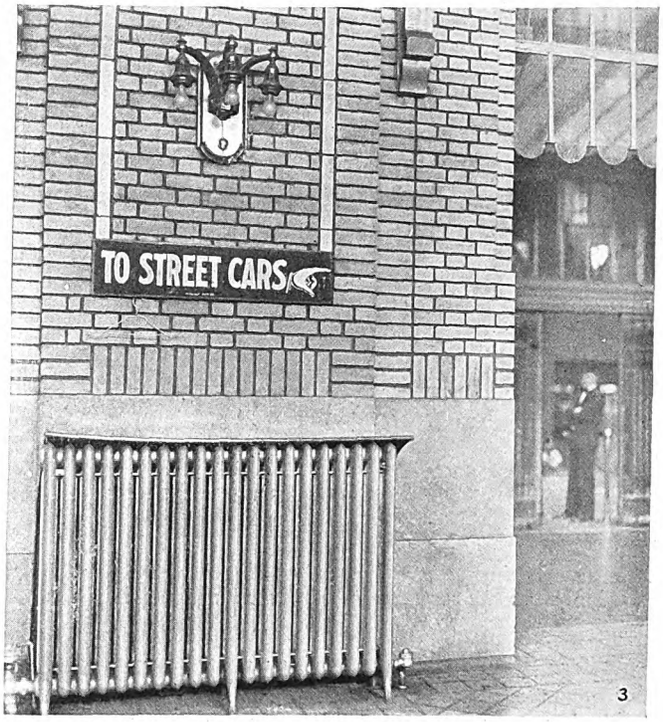

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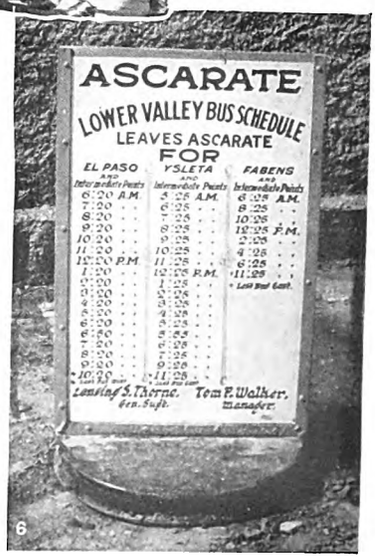

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Some Effective Ways of Informing Patrons of the Service

1. Strangers cannot miss seeing this sign at the Union Station at Denver.

2 and 3. These signs in Detroit, at the Michigan Central Station, point the way to the street cars.

4. The "greeter" of the Lehigh Valley Transit Company is shown meeting visitors to Allentown and directing them which car to take.

5. The conductor of an Aberdeen bus turns the hands on a clock dial to indicate when the next bus leaves the terminal on that route for downtown.

6. A schedule board like this, posted at stopping points, is a great help to the bus or trolley passenger. It is usd in El Paso, Tex.

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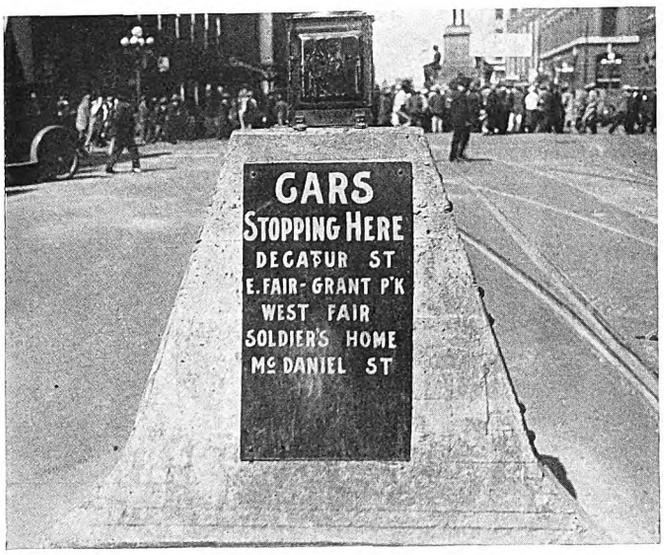


Atlanta combines a stop sign with a loading platform. The sign gives the names of the routes passing that point

Where the maps of the various routes are pocket-size for general distribution, usually a nominal charge is made for them to prevent waste by the public. Usually, also, the map is combined with other data, such as places of sight-seeing interest, schedules of the different routes, etc. Even in such a large city as Philadelphia, the local transportation company has issued maps of its routes at a nominal sum, the proceeds being turned over to the Employees' Helping Hand Fund. Washington, D. C., Montreal, Denver, El Paso, Tex. and Portland, Ore., are other cities which issue maps and data of this kind.

Car schedules may be posted at important points, as well as distributed in book form. The former practice is quite common in Germany and Austria. It is not used in this country to much extent, though it is a convenience which would be greatly appreciated by the traveler, especially on suburban railway and bus lines which run under long headways. An example is shown by the poster illustrated, used by the El Paso Electric Company, concerning the schedule of its Ascarate Valley buses. The schedule is on a large piece of sheet metal. A modification of this plan is that followed by the Houghton County Traction Company, whose posted schedules are in the form of large clock dials with pointers showing the passing times of the cars in minutes after the hour. Schedules of three different routes are shown on as many different dials. A variation of this plan is that illustrated in the view from Aberdeen, Scotland, where the conductor turns the hands placed in front of a clock face, to show when the next bus leaves the outer terminal.

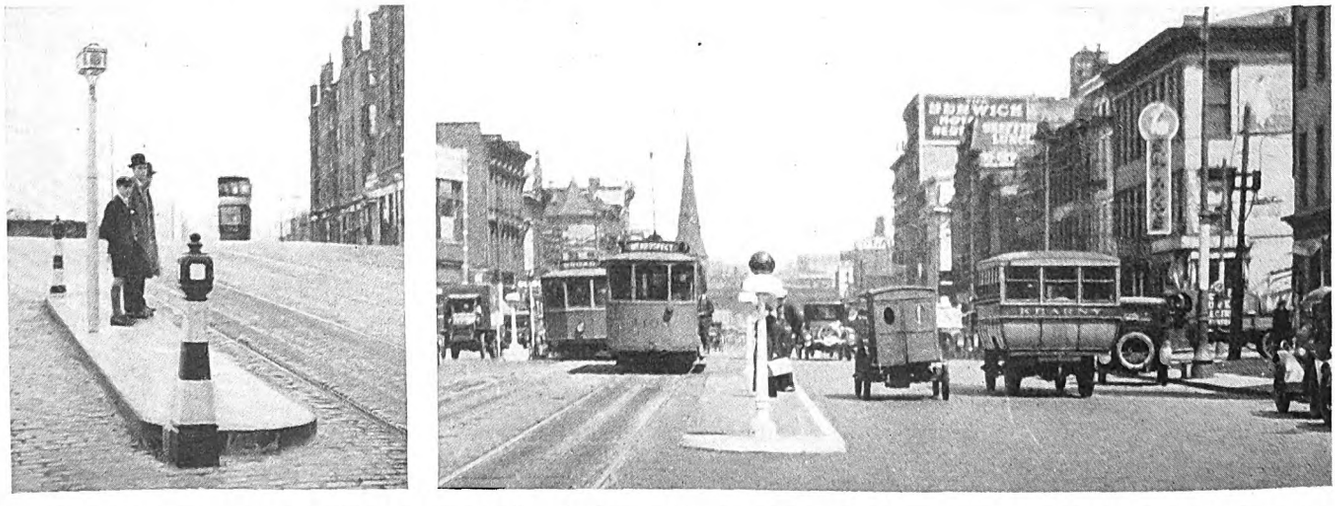
Information Concerning Stops

It may now be assumed that the intending passenger has reached the street on which the car he wants to board passes. He still needs to know where the car stops. If he is a stranger, he may not know whether it stops at the near or far corner, or it may skip some streets. It is to answer questions like these that the "car stop" sign is essential.

Car stop signs vary all the way from bands of white paint on a trolley pole to neatly lettered enameled signs. Some companies don't use any. Obviously, a conventional sign like a band on a pole may be of help to the resident who already has been initiated into its meaning, but it possesses no significance to the stranger. Of little more help are the words "Cars Stop Here" when painted on the sides of poles. Usually they are in letters so small that they can be read only at a short distance, even when freshly painted. Within a year or more, when the pole has become exposed to the weather and, if of wood, becomes scarred by the climbing spikes of linemen, the lettering often becomes almost illegible.

A stop sign should not only be sufficiently legible to be read even at some distance, but should be in a conspicuous position and preferably on the sidewalk exactly opposite the point where the cars stop. This is one reason why stop signs attached to the span poles or hung from span wires are not as satisfactory as those which have their own supports. Accompanying illustrations show three typical stop signs used in Washington, D. C., two for cars and one for buses. They are circular, from 10 to 12 in. in diameter, and supported on a pipe pole set in concrete. The bus sign has the additional feature of giving the leaving time of buses at that point. Sometimes the car stop sign is combined with the island platform, as in Atlanta. One of these is shown in an accompanying view.

Few, if any, American companies use stop signs which give also the numbers of the routes stopping at that point. This, however, is common, almost universal, in Europe.



Typical island platforms in Edinburgh, Scotland, and Newark, N. J. The former is shown primarily to illustrate the method of marking the platforms by striped posts at each end and by an elevated red light in the middle

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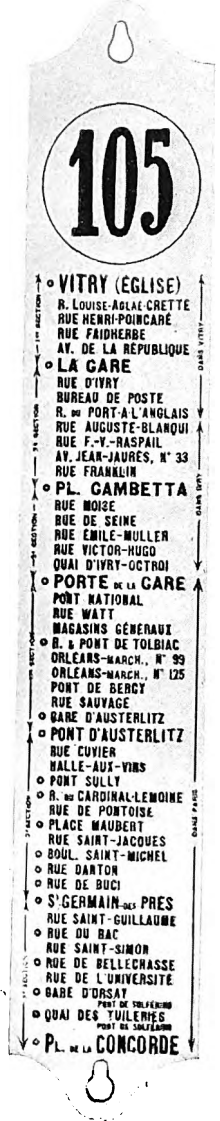
To explain how it is done, such a route sign of the London General Omnibus Company is included in the views.

Car route signs supplement car stop signs. After the potential passenger has reached the point where he is to board his car, the signs tell him which car to take. Car route signs have shown a great advance in design during the last ten years. The roller sign is coming into more general use and shows not only the route but also the route number or letter. A typical modern car sign from Philadelphia is illustrated. The Boston Elevated goes a step farther and carries special signs on its cars when operating them over a "diverted" or short route. One of these signs is reproduced.



Paris Route Plaque

A plaque like this listing the principal points on the route is carried on each surface car in Paris. The points marked "O" are obligatory stops. The number at the top is the number of the route.

The intending passenger has now found his car and the place where it will stop. He now must be helped to board it. This can best be done by an island platform. The island platform should be used much more than it is, especially in these days when streets are crowded with traffic. On a busy thoroughfare, many people are deterred from taking cars because they have to run the risk of being run down by passing automobiles. A safety zone formed by painted lines on the street simply invites intrusion by cars, and one surrounded by movable posts is not much more of a protection. The loading platform also is a great help to anyone carrying a package or suitcase.

Fifteen years ago San Francisco was the only city having any considerable number of these platforms. They are coming into much more general use now, although this country is still far behind Europe in their installation. Views are given of two typical installations, one in Newark, N. J., the other in Edinburgh, Scotland.

Questions Answered on Boarding

The first information which the passenger needs after boarding is the rate of fare. It is curious how many companies seem to think this is common knowledge. It usually is known to residents but not to strangers. Where both a cash and a token fare are charged, it is especially desirable to let the stranger know about the token fare, because by the sale of some to him he may be made into a regular rider during his stay in the city. Passengers with children also are often uncertain as to the age limit for free transportation or half fare. Some companies have used a poster of this kind when fares have been changed, but their permanent use is not common. One of the temporary posters, that used in Baltimore for a short time after the fare increase of Feb. 12, 1928, is reproduced.

In Toronto, disputes as to the age of children near the maximum limit for half fare are avoided by having a height limit, instead of an age limit. The height limit is 51 in., and a mark is painted at that distance above the floor on the bulkhead near the entrance to each car. This enables a one-man operator to determine whether the child should pay half or full fare.

Park Street Station in the Tremont subway, Boston, with the annunciator which shows the waiting passengers the destinations of the cars on the several lines which pass this station

In paying of fare it is desirable to have as little change-making as possible. Change-making is wasteful of time, both for the passenger and the operator. Tokens, when sold for lots for some multiple of 5 cents, are a help, but the greatest time saver is the weekly pass or permit card. These make car riding for their owners much more convenient.

The final transaction in the payment of fare is the issue of a transfer to the passenger if he asks for one. Here also there have been great improvements during the last few years in smoothing the way for the passenger. In Boston the time limit is now indicated by a plain printed line at the end of a series of tear-off coupons for successive hours.

When finally on the car, the information needed by the passenger, especially the stranger, is where to get off. For this he requires a map or printed list of principal points passed en route. Some of the rapid transit lines, as will be mentioned later, have done considerable along these lines, but no surface line has gone as far as the one in Paris where every car carries not only a map of the route traveled, but also a plaque on metal giving a list of all principal streets passed. The map was reproduced on page 1153 of the issue of Electric Railway Journal for Dec. 24, 1927. A reproduction of the plaque appears on this page.

The final service to the passenger is to provide an easy and comfortable exit. This is helped, especially when cars are crowded, by permitting him to leave by the rear platform, avoiding conflict with the stream of passengers entering by the front platform. This is now being accomplished on many roads with one-man cars by treadle operation of the rear platform door, so arranged that the door does not open until the car comes to a stop.

Buses Demand Extra Ride-Selling Effort

In a manner of speaking, a trolley line is a permanent advertisement of service. The rails, poles, wires and distinctive sounds of an electric car are a reminder that

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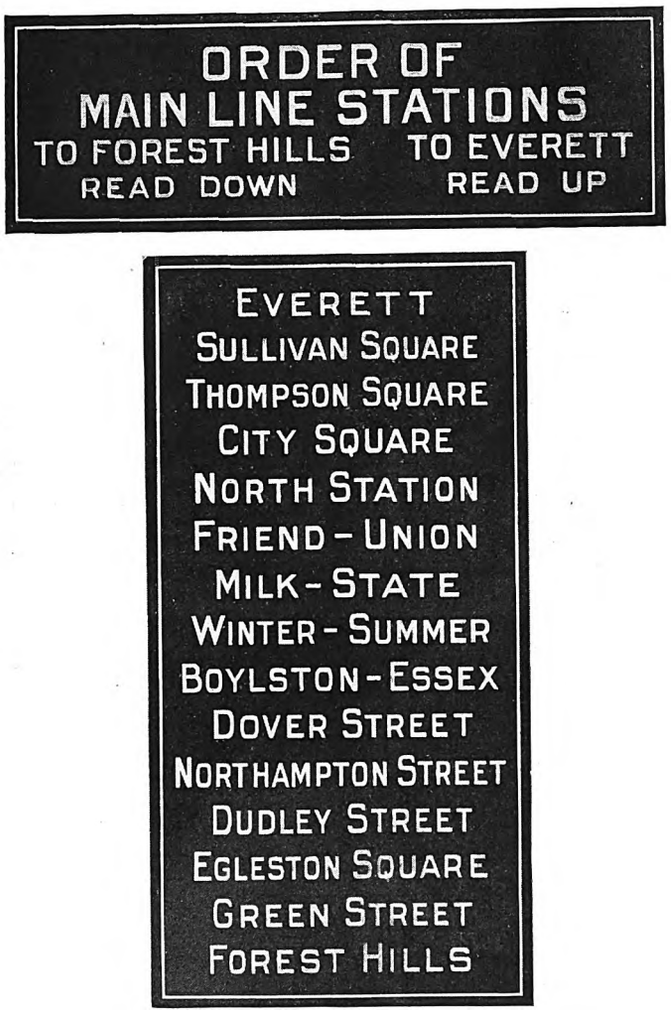


Rapid transit cars in Boston carry a list of stations at which they stop

a public transport is available. On the other hand, a survey of a city of 30,000 failed to reveal any invitations to use the bus successor to the trolley, outside of a few schedule cards in store windows. One could walk block after block without receiving the slightest intimation that buses were being run. If the prospect were walking there was nothing distinctive in the sound of the bus by which he can distinguish it from any other large automotive vehicle.

The long established London General Omnibus Company finds it desirable to put up standards, as already mentioned, showing routes available at given places. Some interurban operators, like the Penn-Ohio system, have put up attractive signs, and simple "Buses Stop Here" standards are not uncommon among experienced bus operators, like the Fifth Avenue Coach Company. What is needed, however, is something to create a desire to use the public service. It may be true, as some managers assert, that "everybody knows about the service." Even so, a prospect walking along the street is more likely to ride if he passes a series of signs which suggest the use of the buses and tell when they are available.

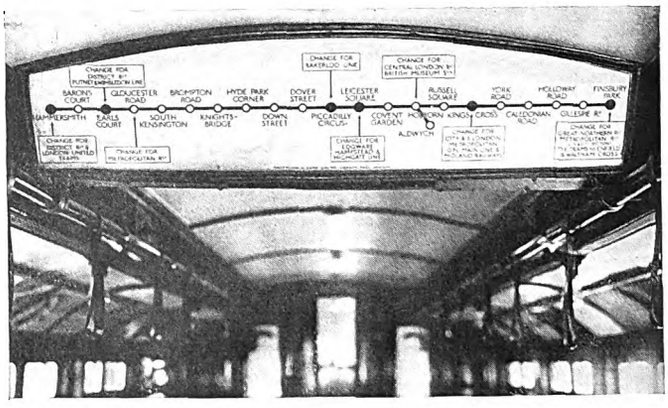
The Berlin Street Railways use for route and schedule information a system of porcelain-like illuminated posts which are even better adapted to a bus company than to a railway. A sign not illuminated is only half-effective. Therefore, bus signs should be located in well-lighted spots if it is not economical to have company illumination.

An effort also should be made to give the buses a horn signal as distinctive as a street car gong, so that the prospective rider can signal it to stop before it has gone by.

What has been written so far deals with the problems of surface lines. When we enter the realm of elevated and subway transit, we reach the size of city where the resident himself needs help when in new territory. It was lack of imagination which led one rapid transit executive to exclaim at a commission hearing: "Why, everybody knows that a red and green lamp at the front of a train means a Crowdus Avenue local, and that a blue and yellow combination means a Jam Street express." Unfortunately, the "everybody" did not include the customers.

Unlike the many-tongued crowds of our cities, practically all the passengers of the London Underground Railways speak one language and know the customs of the land. Yet the management takes nothing for granted. It has a specialist whose chief duty is to devise the simplest possible signs. In one instance, where passengers had a rather long and tortuous walk between two tubes, a sign about three-quarters of the way said encouragingly: "Only one more turning to the station."

Boston probably offers the best example of American practice. Illuminated signs over the station name the next train or car, so there is no needless edging to the front of the platform. When the patron enters the



Skeletonized route maps posted in London underground cars

train he will find an "order of stations" posted on a panel, so he can read in peace with no fear of passing his station.

Maps are finding increasing use on practically all rapid transit systems, both at the stations and in the cars. Skeletonized maps are better for car use than the more elaborate kind because the reader usually is seeking only a route and station name. One from London is shown above.

American electric railways have not as yet adopted the London practice of showing enlarged wall maps of the neighborhood around a station and of using illuminated boxes across the car ceiling bearing skeletonized maps on which important interchange stations receive special emphasis. London also was the first to use names instead of mystic headlamp combinations for destination indicators on trains; also arrows inside the train to show the direction of movement.

All this is reassuring to the rider new to the route. Aids like this are exceptionally helpful on Sundays and holidays when all the family are traveling together to unusual objectives. They should be ready to repeat the trip instead of complaining: "Never again!" Sunday business is voluntary business and should be coddled.

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The Louisville Railway received the highest honor for safety work among electric railways for 1926, the Anthony N. Brady Memorial Medal

Safety

A Strong Appeal to Employee and Passenger

BY

J. P. BARNES

President Louisville Railway, Louisville, Ky.

Between the lines of this intensely human account of the part which safety plays in the operation of the Louisville Railway there is suggested a comparatively undeveloped foundation upon which to build teamwork and interest in selling rides

LET'S begin with a commencement: The Louisville Railway's new post-graduate school in trainmanship recently graduated 135 men who took the July course. Twenty-eight of these men made grades of over 90 per cent. There were only seven failures in the class.

What has this to do with safety?

Just this: These men took our post-graduate course on their own time! In other words, the company's safety program has been successful in making the men want to become more skillful operators of street cars and able to give safer and better service to their community.

Like Christian, we have come a long, hard way, having gone through our Sloughs of Despond; but unlike Christian, we have yet to see any shining towers of success, with the exception of the Brady Safety Award for 1926, which may rate as a very fair sort of tower, however. At least, we think so!

Shortly after a large turnover of labor caused by a hard-fought strike in 1919, we had to build up an entirely new organization. During this reorganization the question arose: How were we to get our men to co-operate with us in a real safety program?

Some hard-bitten executive is likely to arise from his pew at this juncture and inquire: "How in Sheol are you going to interest hard-boiled railway employees in such abstract, pretty-sounding things as courtesy, service, humanitarianism and safety?"

Now, in the first place, I do not accept the premise that trainmen are necessarily "hard-boiled" and difficult to interest in such a broad humanitarian movement as safety. Most of these men have come into rougher contact with life than have the average executive or college man. They know better than most of us what it means to lose a day's pay, and how hard it is sometimes to pay the doctor's bill. They've been up against it, and the safety appeal gets down to where they live. We have

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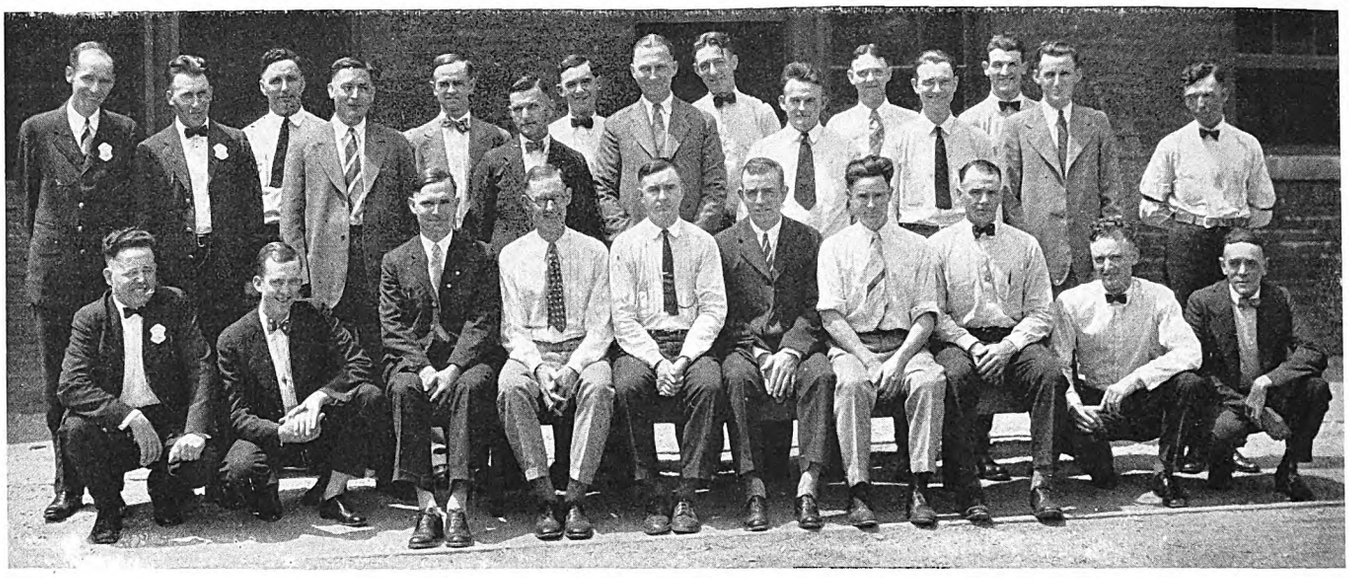

Honor group of graduates of the new post-graduate school in trainmanship conducted by the Louisville Railway. All of these men made grades of over 90 per cent on the final examination

won the whole-hearted co-operation of our men by enlisting their support in the safety movement, not on a basis of dollars and cents merely, but by showing them how to help themselves, their families and their fellows lead safer, and therefore happier, lives, and to prevent unnecessary suffering and the tears of women and children. If that is sentimentality, this company is willing to use more of it!

We are fortunate in being far from the immigration centers and in being able to employ as platform men and shop men an almost wholly Anglo-Saxon body of men (No, I'm not a 100 per cent Nordic shouter!) most of whom have come from the back country and hills of "Old Kaintuck" where even yet much of the speech retains the savor of the times of good Queen Bess. Our men have readily responded to the humane side of safety, in a work which gives every employee, no matter how humble, a chance to help his company, improve the lot of his fellow-employees, and make his town a better place to live in.

Now, I don't want to give the impression that we embarked on a semi-religious crusade, with the officials of the company enacting the part of fervid evangelists exhorting the faithful. There was nothing solemn about it. Gilbert K. Chesterton, in one of his paradoxical moments, says that most men will be very serious about such a momentous affair as selecting a necktie, but that they are inclined to be frivolous about a really serious matter, such as hanging a bishop! We have made a game of safety by having a monthly accident elimination contest between the carhouses, with a dinner being given to the carhouse which operates the greatest number of car-miles per chargeable accident. The winning safety captain is given a new suit of clothes. Each carhouse organizes a safety committee and each man is given the opportunity in time to be a safety captain and to be brought into first-hand contact with safety work. Do the men like it? They fairly eat it up! The interest of every man on the property was caught, and soon good-natured challenges between the carhouses were broadcast, and accidents began to decrease. *Q.E.D.!*

Safety programs, like Rome, are not built in a day. From the very beginning, all of our officials have taken a deep and sincere interest in safety work. We have worked shoulder to shoulder with the men, attending the dinners and conferences, and have convinced them that their part in the program is more important than ours, because while we do only the talking, they are the boys who stand on the firing step and do the real work of cutting down accidents.

Since January, 1925, regular weekly meetings of heads of all departments have been held for the discussion of safety methods as well as to iron out the usual routine matters of operation. Any fault-finding or casting of stones takes place right at the table, and as the talk is definite and frank, alibis do not thrive. A better understanding between departments has led to better maintenance of equipment and service, which in turn has resulted in increased safety, since safe operation is of course predicated upon men and materials and the use made of them. It's useless to talk safety when brakes are not properly adjusted.

In December, 1926, regular monthly conferences of all foremen were instituted. Some of the subjects discussed were Co-operation, Carelessness on the Job, Importance of Reporting All Accidents and Injuries, How the Various Departments Can Be of Service to Each Other, How Best to Impress the Men with the Fact that They Represent the Company Before the Community, Service, First Aid and Politeness.

These foremen's conferences have proved extremely valuable. They have eliminated a great deal of "backbiting" and have helped to make possible more teamwork between the departments and the creation of the spirit of "The Three Musketeers": "All for one and one for all."

Our safety dinners began in 1921 and have now been continuing without a break for seven years. The attendance at the July dinner was the best in the history of the safety dinners, and since the food, which is good and plain, is very much the same as usual one can only deduce that the interest of the men is increasing steadily.

The fact that the men really are interested may be shown in many ways. Recently the case of a very careless motorman came up. This man had had several accidents, and the trainmen at his carhouse had talked with him in a kindly way in an effort to help him. His in-

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spector also tried to make the man see the light, but nothing came of it. Rather than have their safety record ruined, the men at his carhouse appointed a committee which came to the superintendent of transportation and explained the situation to him, saying that while they liked the man his lack of interest in safety made him a liability on the property. This man was released.

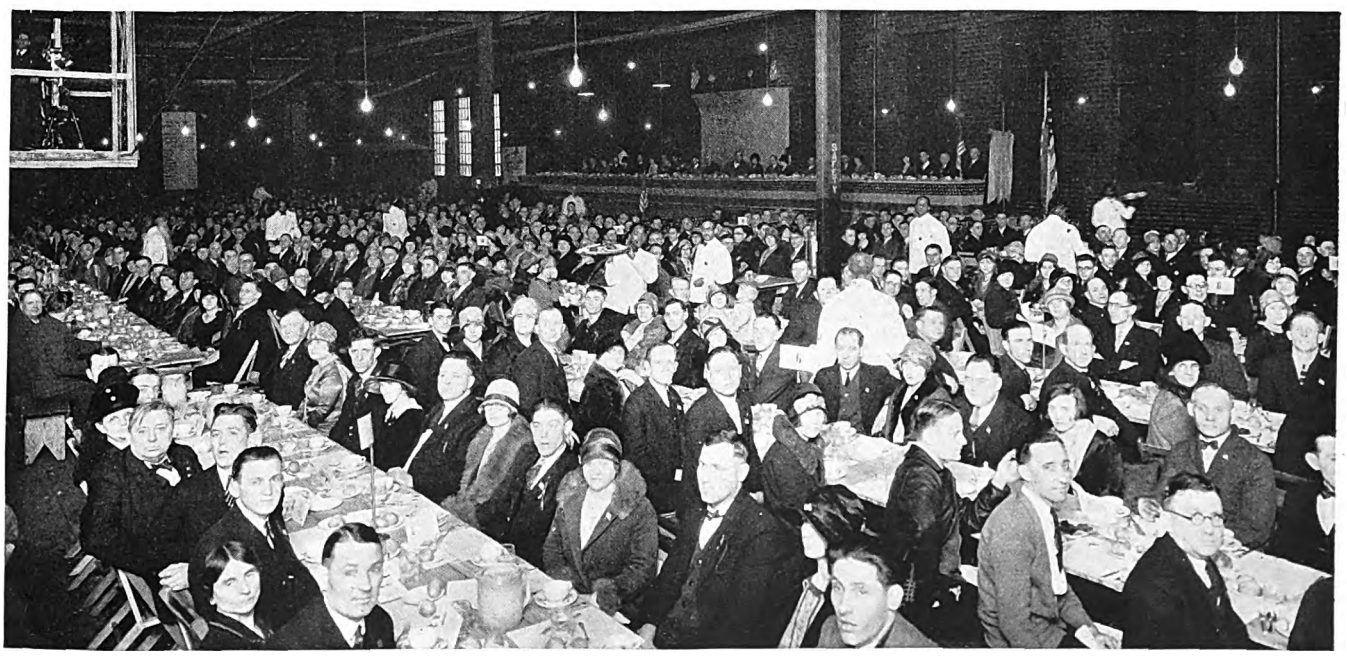
Another promising sign of interest lies in the rallies that the men themselves get up at the various carhouses. The men contribute 25 cents apiece and their wives prepare a Dutch supper. Speakers among the men are arranged for, and the officers of the company are invited to attend. In 1927, six of these impromptu rallies were held.

In recent years the Mayo Clinic has become famous throughout the country. Here in Louisville we have what we call our "Trouble Clinic." We believe that no one can run a street car efficiently if he is worried about home affairs or money troubles. Therefore, each carhouse foreman instructs his men to discuss with our safety department any trouble concerning which we may be of service. We believe that worry, generally over some trifle that can readily be adjusted by someone having legal experience, is the cause of at least 30 per cent of all accidents; mental hazards play fully as great a part in safety work as in golf. If a man's wages are being garnisheed, or if he is separated from his wife because of some petty quarrel, these things will prey upon his mind and he will not be able to do his work as efficiently as though he had no worries. We have succeeded in building up in our employees the feeling that we are anxious to help them in every way possible, and in innumerable instances our safety department has straightened out various troubles and minor legal complications for the men, keeping them in their homes and preventing them from falling into the hands of loan sharks.

Safety work without satisfied men is a contradiction in terms. The office must establish intimate and personal relationship with the rank and file of the men, who must be made to feel that they are a part of the official family. In Louisville we have tried to do away with the awful chasm which existed formerly between the officials and the men by mixing freely with them at the dinners and various conferences, and by being as pleasant and courteous to the men as we expect the platform men to be to the street car riders. The office of a public utility company should not be like a frowning castle set upon a hill, approached reluctantly and infrequently by the men only when they come up for employment, or for reprimand, suspension or dismissal. Before the safety movement, a man rarely saw the officers unless he was hailed before them for the purpose of discipline. Now, the safety movement has given both officials and men opportunities to meet as man to man in a democratic way in a work that appeals equally to everybody. There has resulted a very real spirit of camaraderie and fellowship.

The posting of bulletins with safety slogans accomplishes little or nothing, we find. The men won't read them. There is no substitute for the personal contact of the men and the officers at the group meetings and rallies. Sometimes we have as many as 40 meetings a month between men and officers. One very interesting result of these meetings is that we frequently drift away from the discussion of safety and take up other questions of local interest, such as loan sharks, the civic duty of voting, etc. These discussions are informal and bring the men and officers closer together. We have never believed in giving the men a money bonus for doing well the work they are already paid to do. We do believe, however, in giving them all sorts of recognition, such as publicity, medals, dinners and trips to conventions. To give a man a bonus for safety work would be like giving Sergeant York $10 for every German he killed during the World War, instead of giving him the Congressional Medal!

Our safety inspection committee, with representation from each department, meets each month with the safety director and the secretary of the Co-operative Association, the men's welfare organization, and makes an inspection of every part of the property for sanitation, safety and morale. These men go into the carhouses,



Safety dinner given in January, 1928, in celebration of the Brady Award, and in honor of the December city average of 37,490 miles operated per accident. Every carhouse was represented at this dinner because of having operated over 25,000 miles per accident in December

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power plants and shops, and ask: "What do you fellows need that will make working conditions safer for you? Let us know and we'll get it for you! Don't wait to get hurt!"

We are also firm believers in the psychology of cleanliness and see that the men's quarters are neat and clean. If a man works in dirty places he will be slovenly and careless on the road. We try to flood our shops with sunshine, hoping that the men will absorb some of it.

Each unit of the property also selects a safety committee composed of three men, who in turn elect a chairman. Once a month these men meet at the office with the safety director and the secretary of the Co-operative Association. These men are given office for three months and are entrusted with the responsibility for safety conditions on their property. They are the "head" men when it comes to safety and can order a bad car off the line or institute any other safety measure whatsoever. At all times they are free to discuss safety matters with the safety department and to give suggestions on safety and sanitation. There are at least 300 valuable safety suggestions given us each year by the men.

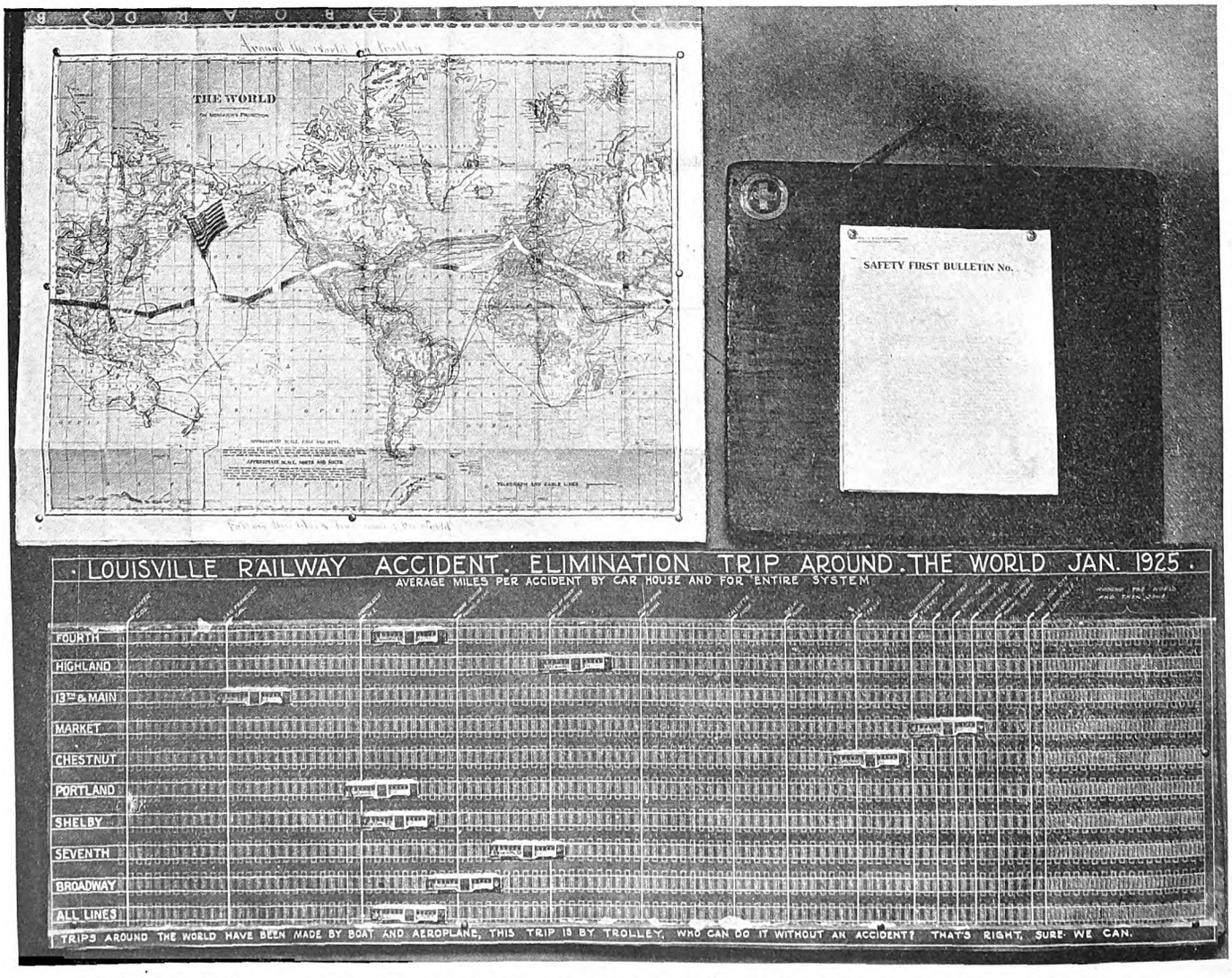
In our employee publication, *Trolley Topics,* which is issued twice a month, the men frequently contribute articles on safety which are given a prominent place in the paper, and on the first of each month, *Trolley Topics* carries on the front page a list of the safety captains of the carhouses. We give this extra publicity to the carhouse men because we feel that they are the shock troops, fighting the traffic battles with which the shop men, power house employees and others do not contend.

Yearly Average Miles per Accident

1921	2,004
1922	3,323
1923	3,404
1924	6,390
1925	7,146
1926	10,354
1927	13,399

The accompanying chart shows that the Louisville Railway, beginning with 2,004 miles operated per chargeable accident as a city average in 1921, has been able by its safety work to lift this average to 13,399 miles operated per chargeable accident in 1927, a distance of over half way around the world.

In January, 1928, every carhouse attended the safety dinner, when the city average for December was 37,490 miles per accident. The qualified attendance was so large that we could not hold this mammoth dinner at Safety Hall, but were forced to turn our paint shops into a banqueting hall. It was a proud moment for us all when Mayor William B. Harrison congratulated us on the recognition that had come to our company and our city through the award of the Brady Memorial medal.



Miniature trolley cars of the Louisville Railway making an accident elimination contest "around the world." One of the devices used to stimulate interest in the safety contests

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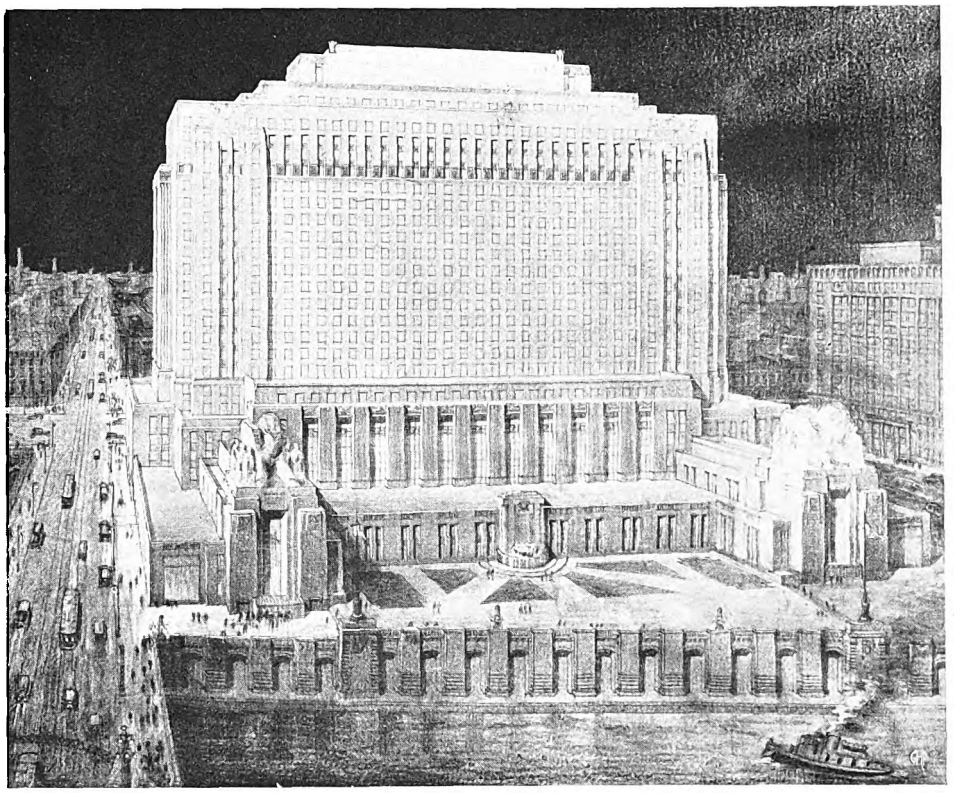

Chicago "Daily News" Building, the first building in Chicago using the air rights over a railway terminal yard

Skill and *Foresight* Needed to Meet the Pressure of Competition

BY

E. J. McILRAITH

Staff Engineer
Chicago Surface Lines, Chicago, Ill.

NEARLY all businesses face keen competition and a constant struggle for survival. The transportation business is not excepted, and the need for studied, continuous effort to shape policies to meet changing economic conditions is not diminishing. Competition in business forces sales development or failure. But the pressure of shifting conditions offers to strong men an opportunity for self analysis and self improvement; it brings out the qualities of clear thinking and leadership. Conversely, under these conditions, weakness and lack of vision ultimately undermine prestige and give way before the inexorable law of the survival of the fittest.

The need for real leadership is particularly pressing in the public transportation business. The attack comes on all fronts and failure to recognize the causes and effects of any one of the several factors that are at work will lead inevitably to further difficulty, if not, perhaps, to ultimate disaster.

Street congestion has become one of the most serious problems confronting both railway managements and the communities which they serve. Unfortunately, few railway organizations have developed an expert knowledge of the fundamentals of traffic control or have taken an active leadership in helping to relieve the traffic troubles that have arisen. The railway business is conducted on the streets. It is absolutely vital to transportation companies, therefore, that the streets function up to their capacity for moving traffic. From a purely selfish standpoint there is a responsibility upon railway managements to do everything in their power to aid in the development of effective traffic control. There is at the same time an admirable opportunity for transportation men to render an outstanding community service in aiding perplexed city officials to meet one of their most baffling problems. Traffic control has not been very well handled in most cities. The principles do not seem to be understood, and mere complaining criticism is worse than useless. Public officials welcome constructive suggestions that are effectively presented by persons or organizations which show themselves competent.

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The Marshall Field Merchandise Mart when complete will be the largest building in the world. It uses the air rights over a freight terminal immediately adjacent to the Chicago central business district. It is another evidence of the tendency toward concentration of business activity

American cities will continue to concentrate in their central business districts those forms of activity which belong in the heart of the community. It is evident that there should be decentralization of manufacturing or the selling of such commodities as staples and foodstuffs. Outlying community centers are necessary and thoroughly desirable; but the great business interests of a city which have to do with the trade of large tributary areas and which are in reality the basis for the existence of the city, must continue to grow and concentrate in a central area.

It is economically sound to have high land values and intensive building development in a small area. It is more efficient for the business that is to be conducted, more desirable from the standpoint of the city development, and can be served by suitable, convenient transportation in a more satisfactory way than if the business district is more widely dispersed. The necessary traffic and transportation to such a center can be kept adequate and convenient with expenditures quite within reason, provided proper use is made of existing street facilities; and provided further, that the economic relation between transportation and property values is recognized in planning and financing facilities to meet increasing population density. Although in most cities streets were laid out for communities of small size and to fit the theories of transportation and traffic of 100 or more years ago, it is entirely possible for all cities to have reasonable traffic and transportation conditions without limitation of building development and excessive fares or tax burdens.

The coming report of the committee on street traffic economics to the American Electric Railway Association at the annual convention in Cleveland this month will present some of the causes of present traffic conditions in large cities. The increasing problem of street congestion is attributable to faulty traffic control, imperfect arrangement of routes of travel and extreme waste of available street space. The present conditions are not at all indicative of the maximum traffic capacity of even existing street facilities. Further increase in density of traffic to and from the central districts will not necessarily be a cause of serious difficulty as a city grows in size, if reasonably appropriate regulations and expansions of facilities are undertaken.

Railway managements must not only have a better knowledge of the fundamentals of traffic control, but also a thorough understanding of city planning and the relation of transportation to community development as well, if they are to serve their companies and their communities effectively. Cities should grow in their central districts in whatever way provides the greatest efficiency for the conduct of business. Transportation should be provided to permit such development rather than to have transportation limitations dictate the conditions under which business can be conducted. The term "business" as used here does not necessarily include local merchandising. Definite and substantial efforts are being made to study the social and economic trends and needs of city life. Some faulty principles of control are in effect. Zoning, decentralization and the traffic and transportation problems are intimately related and the principles which govern their relation are much confused. Local transportation as a business is vitally concerned with the adoption of sound community policies with respect to these several factors. Its executives and personnel must, therefore, take an active and competent part in the study, discussion and solution of the broad problem.

We all know that political persecution has been a serious handicap to all public utilities, and that it certainly has been a major factor in creating some of the discredit attached to railways. But this persecution seems to be wearing off. Recognition of the economic necessity for public transportation is growing in the public mind and is therefore affecting the attitude of political officials. While the railways were in the throes of their greatest difficulties and while the fare question was a popular political battle cry political persecution was merciless. But street railways have proved to be a necessity to the community. The fare question has become quite secondary where satisfactory service is rendered, and it seems almost certain that within the next few years the industry will again achieve its proper place both in public esteem and in the confidence of investors. This will be assured more and more as the railways proceed to

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build into their service the quality and convenience that measure up with modern standards of living. In this there is a great obligation that rests upon the railway manager.

During this past decade, evolution of public wants and revolution in individual purchasing power have taken from the railways their former dominating position, and they in turn have been all too slow in adjusting to meet these great changes. There is an inherent stability in public transportation because it is a public necessity. Business has been thrust upon many companies even when their service and policies were inadequate and shortsighted. It has been difficult to kill the business, but certainly the course followed in many places has been almost ruinous.

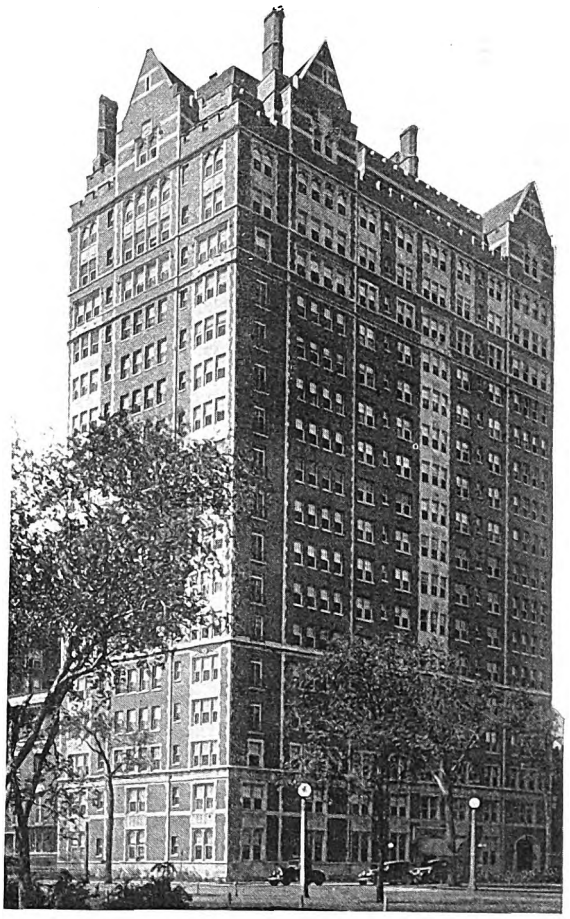
While the measuring stick of gross revenue for successive years is a common way of determining the general trend of the transportation industry's fortunes, this does not always prove conclusive in individual cases. Sometimes unemployment in a particular city creates greater losses in riding than the increases attributable to natural growth in population or to the effort made by the property to attract business. But this cannot account for successive decreases year by year, and in only one of the eight largest cities in this country is the number of revenue passengers for 1927 greater than for 1923.

There is little mystery about the actual cause. While the automobile was being improved in performance and reduced in cost at an amazing rate, the railways were standing still in development, and that meant nothing less than becoming obsolete, out of date, below the standard of comfort and quality to which the great and rapid evolution in the standard of living had brought the public mind. It is not that the electric car is obsolete, but the standards of performance are not adequate nor are they yet changing rapidly enough to meet present conditions. There are far too many old, unsightly, ill-painted cars with inadequate motors, slow brakes, small doors and platforms, narrow aisles, uncomfortable seats, dull or unpleasant interiors and faded painting that are rattling noisily over corrugated track that has loose joints and battered special work.

Of what use is advertising or effort toward building up good will if the cars operated are hideous and a noisy nuisance both to passengers and to all on or near the street?

Car improvements are very actively under way, although the number of new, better cars actually bought is very small. The new lines, paint schemes and simple, cheerful interiors are most encouraging. The new developments in trucks and brakes promise outstanding improvements over the older types, and are headed toward quieter, better operation and a better standard of maintenance. Perhaps the new seating arrangement as recently placed in service with sample cars in St. Louis and Pittsburgh offers the greatest advance in comfort and relief from public jostling that has yet been built into street cars. The car has along each side one row of single seats set at an angle so each passenger is in a seat by himself. This leaves wide, comfortable aisles. The seating capacity is probably as high as can well be used on most lines, except for part of the rush trip, provided the cars are operated on such a close headway as to attract riders because of the short time spacing between them. Many of the older but reasonably modern cars could be given an appearance and quality similar to new equipment by slight remodeling.

Competition is best met by improving the quality of the ride. Advertising is undoubtedly of value, but it is the constant reminder of the quality that comes from satisfaction with the service rendered that really sells more rides. Present competition is most intense from private automobiles and largely because the comfort of street car riding has not improved much in twenty years. The standard has been to provide cheap rides in "serviceable" cars. That type carries only those who feel they must ride street cars.



Modern housing tends also to run to high buildings and intensive use of city land. Such tendencies require a thorough transportation system

R. P. Stevens, president of the American Electric Railway Association, stated recently in an address:

"New designs of street cars, while incorporating electrical and mechanical innovations to give more efficient performance, should tend toward greater beauty of lines and appointments—toward more 'class.' It is the public's verdict. Not only must we have efficient vehicles, but we must make them look up-to-date. We are in the bobbed-hair, silk-stocking, short-skirt era. It will not do to continue offering the public street cars that remind it of bustles and dragging skirts, with shot sewed in the hems, lest a vagrant breeze expose a cotton stocking and a petticoat. These things smack of antiquity, and the public refuses to be old-fashioned."

Of course, costs have grown so rapidly during this period of change covering fifteen years that it is difficult to assume added charges. Using as an illustration one of the largest companies, trainmen's wages are now three times as high as in 1914, while the prices of materials are substantially 1½ times as high. However, improved methods have resulted in lowering the costs of operation from what they would have been under such striking

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rises in labor and materials. In 1914, the operating expense, exclusive of taxes and renewal fund, required 51 cents out of each dollar of income, under a 5-cent fare. In 1927, under a 7-cent fare, it required 65 cents out of each dollar of income. This brings the rate of operating expense to 1.8 times what it was in 1914. In cities where one-man operation has been possible, marked reductions in cost have been effected, but there are decided limitations on the use and economy of one-man cars in the larger cities.

However, the cost of operation is not the sole question of interest. If properly planned increased expenses can develop greater gross and more net income, then such operation is decidedly good strategy. Slow operation, for example, may decrease the cost for electrical energy more than it increases the cost of trainmen's wages on lines with the longer headways, but it surely drives away customers.

In too many instances there are still great possibilities for skilled scheduling to produce better service with lower cost or equally good service with less expense. More money should be spent by all companies in obtaining or developing such thoroughly competent attention to the planning and analysis of operation that will insure the greatest sales value in service rendered and the best net return. Insistence on lowered costs in all departments is not necessarily sound policy. Railways need the most skilled men who can be obtained for the management and planning departments, for the problems encountered are intricate and difficult.

In a large city it is impracticable for a company to give with mass transportation vehicles service to fit all routes of travel within the city. There are districts that cannot possibly justify public transportation. There are lines of travel which must be served only by private conveyances because of the small number who could be served by public carriers if they were available. It is also an advantage to have part of the people travel by private carriers in the period of the greatest demand for service. The company cannot hope and should not attempt to duplicate the convenience of private vehicle service, but should carefully provide all reasonable needs for public carrier operation. Attention should be concentrated on giving better service, considering headways, quality of ride, and better distribution of routes, even at a higher cost.

Giving poorer service because of increased costs is not the way to develop increased profits or produce the fare needed for profit. Cheapening of the product is neither the way to attract business or to meet competition. Street railway riding has fallen off because of the poorer quality of the service rendered in comparison to what people have learned to demand through experience with their automobiles.

James H. Collins writes very pointedly in *Manufacturers' News* for July, 1928:

> You may be aware of some case in which an eclipsed business has come back through lowering quality to meet the situation. I know none. But there are plenty of instances in which the public responded when competition was put on the plan of better value for more money.

L. D. Rutherford is quoted in the same magazine:

> Quality, consistent with cost, is sought by everyone of our hundred million American buyers, and the sooner trade in general assimilates that fact and conforms its business to it the better will be all industry.
>
> The sole means to the end of better profits is quality. Quality products and quality merchandising. The manufacturer who, regardless of product, can keep one step ahead of the cycle of public preference and demand and uphold a high standard of quality—his is the manufacturing business that will grow and his is the product that will establish the standard for the public.

Management is presumably responsible for the success of business. As business conditions change management must be prepared to adjust, and by previous planning be ready to continue without too serious shrinkage in resources. Street railways have been less seriously hurt in this last ten years than the cotton manufacturer, the retail store or the phonograph maker. None of us are interested in the other fellow's troubles. We mercilessly turn from our old habits to the new and let the other fellow do his own worrying as to the adjustment. So it is the railway managements' own job to develop ways and means with which to restore the prestige of the railway business.

It is not merely a question of getting suitable equipment, track, shops, organization and fare. Those are management problems of complex difficulties indeed. But the "follow-through" on the details of daily routine is equally important for creating a successful standard of service and a satisfactory net return. If the organization is really completely concerned and unitedly driving daily to give more regular, dependable, speedy, safe and appropriately frequent service, there is little doubt of a growing success. But each man needs constant encouragement, training, supervision and support. Only when the management itself puts real effort into each day's performance can there be the steady improvement that is needed. Too often there is discouragement, lassitude and lack of vision and enthusiasm at the top of railway organizations. Sometimes the responsibility goes beyond the management to those who hold the purse strings. All too frequently the men doing important work are not adequately skilled. The quality of men or training needed to cope with the intricate problems of transportation, scheduling, and maintenance, are not being sufficiently developed. Many of the best men have been inducted into the more lucrative field of power. Yet transportation needs even more skill and foresight because of the greater dependence of the business upon the factor of personnel.

It is mismanagement to build an organization that tries to function without constantly keeping the pressure of work foremost, without having sympathetic but active supervision continuously proving that the details are being cared for, and without knowing that each man of the organization is being trained and encouraged to do his work better. Good management builds success through the combined efforts of a trained organization even under great handicaps because of careful attention to detail that is encouraged by the policy of the management in seeing that detail is delegated effectively and followed through intimately by competent men.

The spirit within an organization and the good will of the public for an organization and its service are created principally because of the ability of the executive head to keep his staff actively training, supervising and encouraging the organization. The higher the position that a man holds the more actively should he attend to the business of the company. When the leader in an organization is not sufficiently active the quality of the company's service is seriously affected. The quality of management is more important than any other factor, both because it is the mental attitude of the entire group of workers that determines the product of the organization and because alert management, when the business fills a real public need, will find ways of correcting all other handicaps.

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A Friendly Public Is the

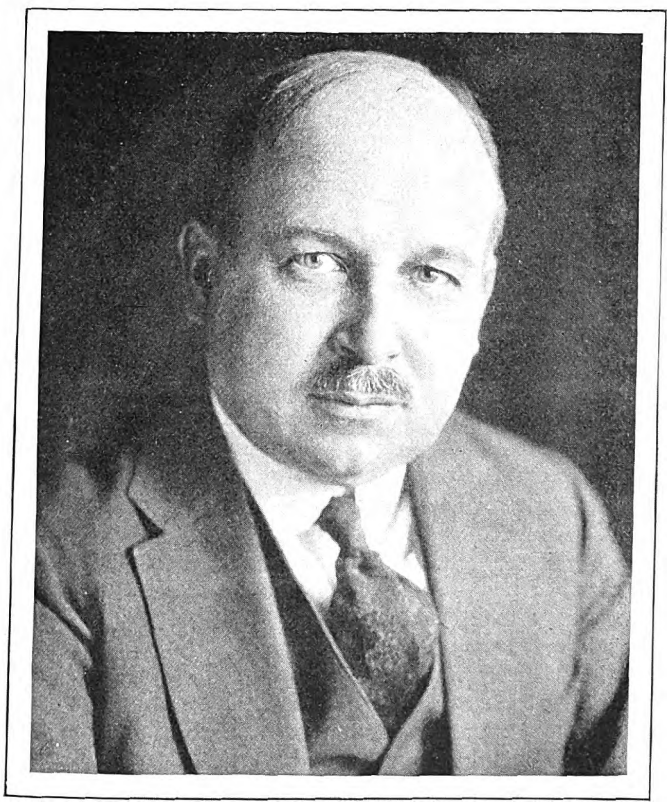
Principal Asset

and the Chief Executive Must Play His Part in Developing It

BY

WALTER A. DRAPER

President Cincinnati Street Railway, Cincinnati, Ohio



Walter A. Draper

PERHAPS the most important step in "Selling better transportation better" is that of developing and maintaining a friendly public. Only through an honest desire on the part of everyone in the company, from the executive on down to the lowest in rank, to please the public, can this be accomplished. The rôle to be played by the executive and what he can contribute are brought out in this extremely intimate discussion by a man who practices what he preaches in public relations.—EDITOR.

IF ONE were to select some subject in connection with electric railway matters to talk about, "Depreciation and Obsolescence," "The Extent of Public Control Under a Service-at-Cost Franchise," "The Best Type of Equipment with Which to Meet Competition" or some similar subject probably would be chosen, for there is room for discussion and difference of opinion in talking about topics of this kind. But on the "Need For a Friendly Public" there is no room for argument. A friendly public *is* the principal asset and that is all there is to it.

Still, although we can't argue about the fact, we can and do pay a great deal of attention to it and I sometimes wonder whether the public is conscious of how much public utility operators do desire to have a friendly contact with it. Possibly it is just as well, because if both the public and ourselves were conscious that we were striving to secure friendly recognition it would be harder to bring about.

THE ENDEAVOR merely to create a friendly atmosphere without the real solidity of good and dependable service behind it would result in a condition very much like a puffball in the woods, which, when put to the test of real pressure, sends forth a little cloud of smoke and collapses.

The endeavor merely to create a friendly atmosphere without the real solidity of good and dependable service behind it would result in a condition very much like a puffball in the woods, which, when put to the test of real pressure, sends forth a little cloud of smoke and collapses. It is all right for us to open the door to the public and show in every way we can that we are human and desirous of receiving criticism and complaints, but unless we have the real solid background of giving full measure of service our friendly public will soon fade away or be metamorphosed into an unfriendly one.

One man's observation on the subject of public relations probably is not worth much to another. I always have doubted the advisability of trying to lay down a fixed rule in anything but mathematics or some exact science. Every man must follow his own method, worked out of his own personality and temperament. One man can't play his best game with another man's golf clubs. Furthermore, methods must be adapted to local conditions.

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What will work in one city might be a tremendous mistake in another. A story of what you have done in your city might be interesting but not very helpful to me, while the fact that I may have succeeded with some policy doesn't mean that you can use it in some situation that is facing you. You must go out and get your own friendly public, because it cannot be made to order nor can it be created by following the rules in some textbook.

"Friendly public" with us means about the same as "good will" to a manufacturing or merchandising concern. There is one big difference, however. An individual, a firm or a company in ordinary business may capitalize and issue stock against good will, but commissions, courts and municipal authorities for years have been insistent that out of our capital structure there be pruned or exuded every trace of good will. Our business is different from the soap business or the soft-drink business or the automobile business, in that whatever we can earn on our good will can't be paid out in dividends to our stockholders but must be given in the way of service, comfort or convenience to the public which has extended this good will toward us. We might liken this good-will stock of ours to the ultra-violet rays which the spectrum doesn't show but which we know are present. So we know that while not convertible into money or tangible enough to be segregated and weighed, nevertheless there is this good-will stock divided equitably between the public and the company. On it dividends are paid in courtesy and service to the public, and friendly criticism, thoughtful suggestion and constructive complaints to the company.

IT IS ALL RIGHT for us to open the door to the public and show in every way we can that we are human and desirous of pleasing and receiving criticism and complaints, but unless we have the real solid background of giving a full measure of service, our friendly public will soon fade away or be metamorphosed into an unfriendly one.

If we realize how futile it is to cultivate a friendly public artificially without having the good rich earth of adequate service and courtesy in which to grow it, then we must be willing to expend time and thought and give every care to the growing plant. I recently had a striking personal illustration of the amount of attention that can be paid to one customer. I was riding on the front seat of a street car with a neighbor, one branch of whose business consists of repairing broken and battered silverware and bric-a-brac. He drew from his pocket something wrapped up in a paper. It was a hollow mosaic egg, which had been shattered badly. He explained that the egg had been brought to him by an old lady with the request that it be repaired. No one in his establishment had been able to do it. He himself, therefore, had taken the egg home to work on as if it were a glorified jigsaw puzzle and he finally had succeeded in getting it together. I asked him why he took all this trouble to please somebody who would never give him any business and from whom he certainly would take no pay no matter how successful he might be in putting "Humpty Dumpty" together again. He turned and looked at me and then pointed to the poster we had put inside our cars, quoting a little commendatory expression we had received from a car rider just to let the public know that we appreciated a kind word and that the door was open for such expression, kind or critical.

"I worked on this busted egg," replied my friend, "for the same reason you put up that poster. Don't you know that a friendly lot of customers is the biggest asset I have?"

Substitute "public" for "customers" and the same statement is true for the electric railway industry. The only difference is that the whole public comprises our customers, where my friend's customers are limited. Not only did this observation by my friend give me the parallel between his business and mine, but it also served to confirm me in the belief that our publicity methods do reach the public.

When I reached my office I began to think over the various ways in which we can reach the public and how necessary it is to have things organized so that advantage can be taken of the very many opportunities for friendly contacts. It is quite obvious that no executive himself can see every man, woman or child with a complaint or a suggestion, but the better one is known in his community the more often opportunities present themselves to relieve a tense situation, to satisfy a complaint, to explain a bothersome condition or to receive and act upon a valuable suggestion. Most of these must be taken care of by a proper department. Many of them are presented to such a department through intelligent and thoughtful consideration on the part of the public itself. Nevertheless, many do come to the attention of the executive, and I have in mind many instances in which I have worked just as hard as my friend in putting the mosaic egg together again in trying to increase our assets by adding to the number of people who might be included in the friendly public.

In one instance I spent the better part of an hour trying to explain to a woman in her eighties why the company couldn't buy from her the two shares of its stock that she owned. She finally got the point. My thoughts still go back to the cold winter morning that my telephone bell rang at half past two and an indignant voice wanted to know why the night owl stopped just six squares short of the place where he wanted to get off. It was hard to keep my temper, but I think he was more ashamed than indignant when he hung up. On another occasion, I spent what seemed to me the better part of an afternoon trying to explain to the minister of a downtown church why we couldn't advertise on the outside of our cars his own particular Easter service, and he finally agreed with us.

Some pleasanter things have happened, as, for example, when at the request of a woman whose husband was seriously ill I was able to have the sprinkling car wash away the dust in front of her residence. The dust which came from newly-laid paving gathered in the throat of the groove rail and increased the noise of our cars, causing considerable disturbance to the patient.

Another time a woman who was chairman of a committee of a large organization called a meeting of her committee to discuss a proposed change in route on one of our lines and was humiliated to find that the notice had gone out wrong and that she and I were the only two present. I explained the proposition fully and made as good a public speech as if I had had an audience of a thousand. The result was that she had a meeting of her

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committee later at which she herself fully explained the situation and got a unanimous vote in favor of our plan.

Another change of route so incensed the neighborhood that some residents threatened to burn down one of our carhouses and I remember the many weary hours I spent discussing the change with members of the Council and other city officials. The argument continued for two or three months, but I had the satisfaction a few months after the change had been made of having the leader of the malcontents come to me and say that I was right and they were wrong and that they wouldn't change back again for any money.

One hot summer afternoon I was inveigled into visiting a remote section on a suburban line to meet a committee that desired a waiting station erected. Although I had to cancel an important engagement in my office to be there I was repaid by the enthusiasm with which the whole community turned out some time later to celebrate the erection of a little shed at the cost of $100.

THERE ARE many tense situations that can be relieved and many cases that might develop into trouble that can be handled best by an executive who speaks with authority, and when they come the executive should take the time to handle them.

On another occasion considerable trouble was caused by a man who felt that municipal ownership was the only cure for all transportation ills. I deluged him with literature, wore him out with talk and tired him with many inspection trips. After we had been operating under our present plan for a year or so, I was gratified at hearing him say that with conscientious operation under a service-at-cost franchise the public would have all of the blessings without any of the drawbacks of municipal ownership.

All of these things have taken time and are probably not in the field of work that should be undertaken by anyone except the public relations man. However, I have found it a pastime or relief from the consideration of strenuous operating problems to listen to these complaints and suggestions and to try to solve them and satisfy the people who make them. There are many tense situations that can be relieved and many cases that might develop into trouble that can be handled best by an executive who speaks with authority, and when they come the executive should take the time to handle them. It is as satisfactory and as interesting to make this friendly feeling grow as it is to plant the seed of a rare flower, to watch for the first sign of its head pushing above the soil, and then to water and nurture it until it grows to a beautiful and productive plant.

It is not merely a satisfaction to help bring about this good feeling, but it is one of the necessary things to be done. I am not one of those who believe that public good will can be procured either by purchase or hard work and then counted on to remain as firm and unchanging as the rocks of the hills. The public is a fickle friend. Try as we may we cannot have everyone understand every situation, and there will always be an opportunity for the politician and vote getter to turn our mistakes against us or to stir up trouble when we are unable to meet some unreasonable suggestion.

Consistent fairness, honesty, frankness and friendliness on our part must be accompanied by equally consistent firmness, whether in carrying out something that is agreed to or whether in refusing to support some policy that is unsound and impossible. Persistency pays. We cannot forget, however, that building up a friendly public cannot be used as the smoke screen to cover inadequate service, nor can the effort to secure good will be carried to the extreme of doing what is economically unsound or impossible of continuance.

Good Will Pays Dividends

"FRIENDLY PUBLIC" with us means about the same as "good will" to a manufacturing or merchandising concern. There is one big difference, however; the electric railway cannot capitalize and issue stock against its good will. . . . Nevertheless there is this good will stock divided equitably between the public and the company. On it dividends are paid in courtesy and service to the public, and friendly criticism, thoughtful suggestions and constructive complaints to the company. —W. A. DRAPER.

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Determining the PROPER PRICE for the Transportation Product

BY

RICHARD SACHSE

Consulting Engineer, Los Angeles, Cal.

Richard Sachse

THERE ARE three distinct steps in any merchandising program—manufacturing a salable product, fixing the proper price at which to sell it and the actual selling. The second step, that of fixing the price, is a very important part of transportation merchandising. Mr. Sachse herein approaches the question of rate-making from a very unusual angle and emphasizes some of the factors which have been badly neglected both by transportation executives and regulatory commissions.—EDITOR.

FIXING and collecting the right price for the product manufactured—mass transportation—is the all-important problem of the urban and interurban mass transportation systems. Such transportation must be sold at a price the buyer is willing to pay, and the price must be high enough to pay for the cost of a service the buyer is willing to use. Rate-making, that is, the power to determine what that price shall be, within economic limits, is in the hands of the regulating commissions. The courts can, at best, only prevent long continuing and glaring confiscation; but a price that merely meets the confiscation test with no margin above does not and can not cover the full cost of good service and will not, in the long run, hold the riders.

There is no doubt that to a very great extent the weal or woe of these utilities is in the hands of the commissions. Neither is there doubt that, generally, the commissions are willing to deal as fairly with the utilities as with the public from which their power flows, and as a rule they are possessed, using the language of the Supreme Court of the United States in a recent rate decision, "of that acute appreciation of justice which should characterize a tribunal charged with the delicate and important duty of regulating the rates of a public utility with fairness to its patrons, but with a hand quick to preserve it from confiscation."

How does a regulating commission fix transportation rates? In the electric railway field where rate increases during the last ten years have been the rule, the initiative generally is taken by the company. An application is filed; an investigation conducted; an official record made. Upon that record the commission under the law must base its decision. The commissions have their own staff of experts: attorneys, engineers, accountants, service inspectors. It is to be expected that as a rule a commission will place reliance mainly on the testimony of their own employees and be inclined to accept their recommendations. If a case goes to court the court will give every benefit of doubt to the findings and rulings of the commissions.

COMMISSIONS HOLD OPPOSED OPINIONS ON RATES

A superficial analysis even of the records and decisions in recent rate proceedings very clearly shows that different commissions and their staffs are holding diametrically opposed opinions on some of the most vital matters connected with rates and the making of rates. Reference here is not to such controversial legal matters as valuation methods, the treatment of depreciation, rate of return, matters slowly and cautiously being passed upon by the United States Supreme Court, but to matters subject to determination by experiment and established fact. Do rate increases produce increased or decreased gross and net revenue? What has been the effect of rate decreases on gross and net income? Does riding correspondingly increase and decrease with rate changes? Is there a peculiar virtue in the nickel fare? Can any conclusions be drawn from the long-

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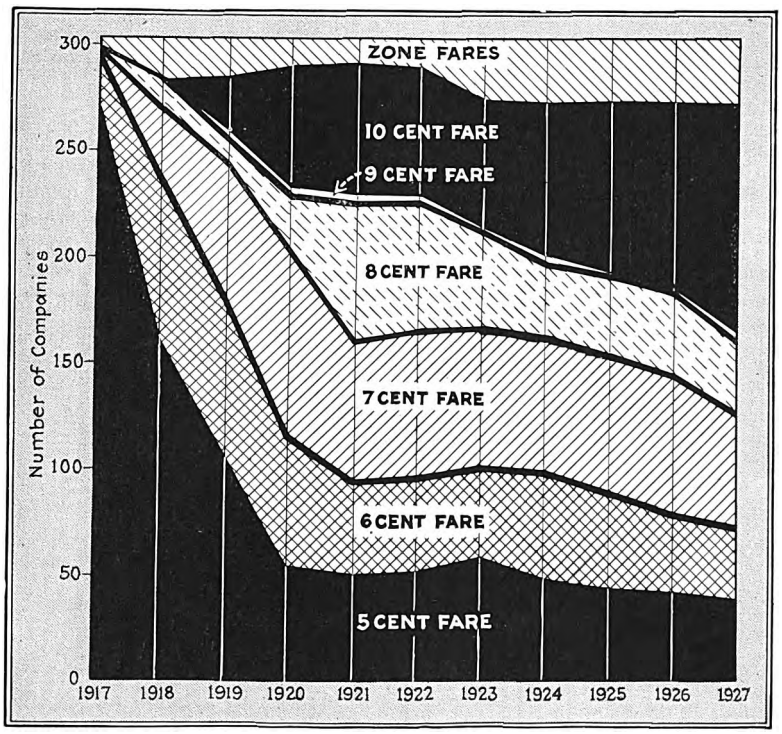
continued and widespread use of the so-called multi-coin fares? Which is the more important factor: lowest possible rate or best possible service? Are the mass transportation utilities engaged in a declining and hopeless business—are they standing still, stagnating or are they going forward? Is it true or is it not true that even if a commission is willing to allow them a fair rate the companies will not be able to collect it?

To all these and to other equally fundamental questions the responsible managing officers of the electric railways throughout the country believe that definite and reliable answers can be given, but such belief is not shared by the majority of the commissions and their experts. There is no lack of inclination on the part of the regulating authorities to give to the transportation utilities less of a square deal than is given to other utilities such as electric, gas, water, telephone and telegraph. If, nevertheless, it is true that the electric railways have found it more and more difficult and in some cases impossible to secure rates permitting their healthy existence, the causes of that condition cannot be found in any ill will of the public or any ill will of the public's official representatives. Nor is it true that the mass transportation utilities have fallen upon evil days because their functions have become obsolete, or because they furnish a service no longer needed or wanted. The opposite is true. The changes in the mass transportation industry within a space of less than one generation have been nothing short of revolutionary and it is a fact, of course, that the automobile was and still is the immediate and ultimate cause of most of these changes.



Distribution and trend of cash fares, 1917-1927

This chart, prepared by the A.E.R.A., shows the rapid decline in the use of the 5-cent fare and the corresponding increase in the 10-cent fare and other rates.

It is still a question whether the modern system of mass transportation in competition with the public and private automobile will survive in the smaller cities and the moderately populated suburban and interurban communities of say 100,000 population and less. But no doubt whatever exists that electric and motor mass transportation is a more essential utility and is in greater demand than at any time in its history in the large cities of the country and in all densely populated communities. The managing officers of the mass transportation industry are in agreement that quality and character of service are controlling and of much greater importance to the public than a reasonable fluctuation in the cost of a ride. The correctness and soundness of this conclusion are challenged by some of the rate-making authorities. Almost all of the commissions are governed in the fixing of rates by more or less standardized considerations of valuation, depreciation, past operating expenses according to prescribed accounting classifications, rate of return and similar factors, all of them legal concepts to quite an extent.

Rate Schedules Should Consider Classes of Service

The value of the different kinds and classes of service provided for the buyer, his ability to pay, his status as a wholesale or retail, an occasional or regular rider, a peak or off-peak consumer—such factors and differentiations have had much less influence on the rate structure of street railway mass transportation than they have had in the tariffs of utilities selling gas, water, electric power and light, and telephone and telegraph service. One of the urgent tasks of the industry as a whole, and a special task for many of its individual units, is a study and a determination of the best possible rate structure for our mass transportation systems under their different classes of service and operation in the light of the present-day conditions confronting the industry. And when this task is approached it must be with the acute realization of the great changes in the industry within the last few years. Our manufacturing methods in shop and power plant have largely adjusted themselves to the new conditions of the present day or are still in the process of adjustment. In comparison there has been but little change in the methods of selling the product, and rate-making in our industry is essentially the same as it was before the advent of the automobile.

Increasingly large numbers of people to whom the proper functioning of our mass transportation utilities is of vital concern are being convinced that a new and better technique than the present one, a better method of dealing with the problem, is needed. This conclusion is forcing itself not only upon the managers and owners of the electric railways but also upon city officials, upon business and property organizations, upon the regulating commissions and upon the average man and woman struggling with the growing congestion of our big cities. Under the law the commissions have nothing to say about street traffic conditions, about tax and paving burdens, about franchise conditions. Their function is as a rule confined to rates and securities and in some instances to a measure of control over service.

All political subdivisions of the state are extremely

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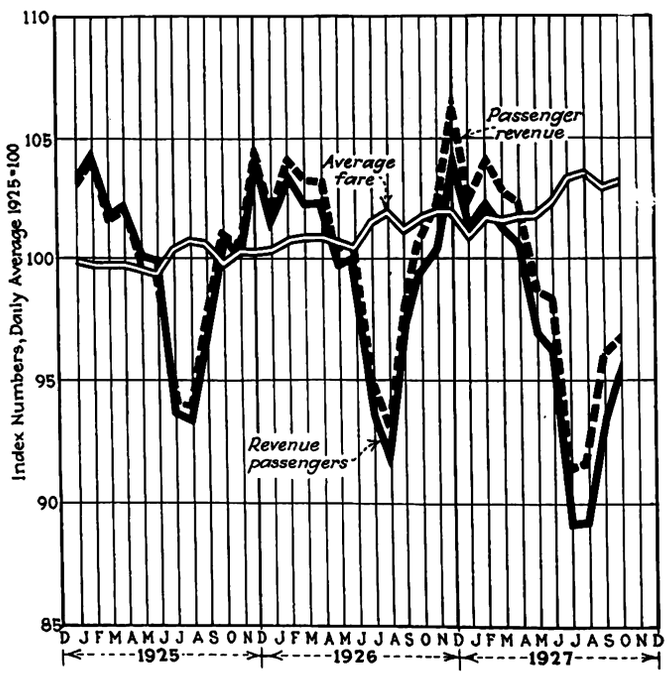
jealous of their home rule powers, and the tendency of the day in our large cities is to curtail the powers and functions of the state commissions in matters affecting the city's destiny. As a consequence we find in rate proceedings the city attorneys quite regularly opposing and fighting the transportation utility, and the commissions' decisions often represent a middle course between the claims of the company and those of the city. It is true that here and there we find a notable exception to this rule. In the Los Angeles street railway rate case the city attorney in the hearing before the Railroad Commission made this statement:

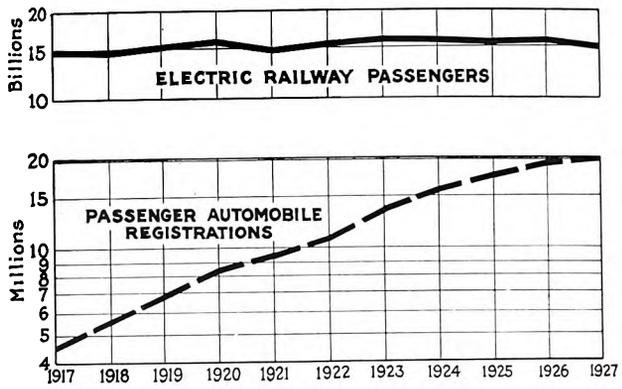
> Certainly we have no desire to be put in the position of denying to the company anything to which it is validly entitled. It is true, Dr. Wilcox has frankly stated on the stand that in his opinion the company is entitled to approximately $1,000,000 additional revenue. If the commission thinks and its engineering staff feels that they have gone sufficiently into the operating expenses and all of the other elements going to make up a rate to agree that the company is now entitled to an additional revenue of $1,000,000 on an annual basis, then assuredly this company is entitled to relief. As to whether or not they are entitled to an interim rate it seems to me depends upon the question of how soon we may reasonably come to a final conclusion in the case. I think it is undesirable to have an interim rate if a final rate can be arrived at speedily. If it is going to take six months to arrive at a final conclusion in the case and if we agree that they are $1,000,000 per annum under a fair return, then we would be asking that they be mulcted in the sum of $500,000 if we object to an interim rate. We are not in that position.*
>
> **This statement was made on May 28, 1927; the rate case is now in the federal court and the company has not yet been granted any rate increase above the old 5-cent fare.*

When the fact is kept in mind that the health, stability and growth of all kinds of business, of property values, of the convenience of almost the entire city's population and even of their safety and general well-being are so largely affected by the mass transportation service, it is difficult to understand any blind and unreasonable attitude of antagonism towards the agency providing this vital necessity and utility. If trouble is taken to scratch the surface it will be found that such antagonism in fact does not exist. Where it appears it rests and fattens upon misunderstanding. It survives as a tradition from days that are dead and gone; days before there was such a thing as effective regulation.



Trend of traffic fares, revenue passengers and passenger revenue of 134 electric railways, 1925-1927

These curves, also prepared by the A.E.R.A., show that although average fares have increased steadily, passenger revenue has continued to decrease.



Electric railway traffic and passenger automobile registration trends, 1917-1927

Figures show that electric railway passenger traffic has not been affected materially by the enormous growth of automobile registrations.

The real interests of a big city and its transportation agency today coincide and are mutual, not antagonistic. This is a fact that must be made clear to the public and to the authorities, and the task is for the transportation utilities. Means should be created in all large cities to make it possible for such mutual interest to function properly. The provisions for joint investigation and joint hearings in the 1920 Interstate Commerce Commission's act, making it possible for state commissions and the Interstate Commerce Commission to act together in matters of joint jurisdiction and of joint concern of the nation and the states, may be taken as a pattern for the state and its subdivisions.

Fare Plans of America and Europe Differ Widely

American cities and street railways have developed largely under the mass transportation program of a flat city-wide fare, and they have not as yet come to a general acceptance of the zone system that is the almost universal rule in European cities. There is, of course, nothing fundamentally wrong in either plan. Each scheme has its advantages and disadvantages. In any given case the plan best suited to the individual need should be adopted. It is not accident, however, that has led to the differing schemes of rate structure in the old world and the new. Conditions of living and of work and of business are not at all alike. No European city is as definitely divided between working quarters and living quarters and between business and home as are our large American cities. The differences between peak and off-peak traffic are not as great in European cities, and the peak hours are not as short and as clearly defined.

Subdivision and suburban development have not been nearly as pronounced and unhampered and rapid as with us, and home building, even before the war, was limited compared with American home building development and has always been a difficult undertaking for the European family of moderate income. A powerful influence has been exerted by these conditions upon the rate systems, and the tendency has been toward fares based on distance and towards numerous small zones.

In America the trend has been in the opposite direction, towards expansion, simple rate structure, no zones,

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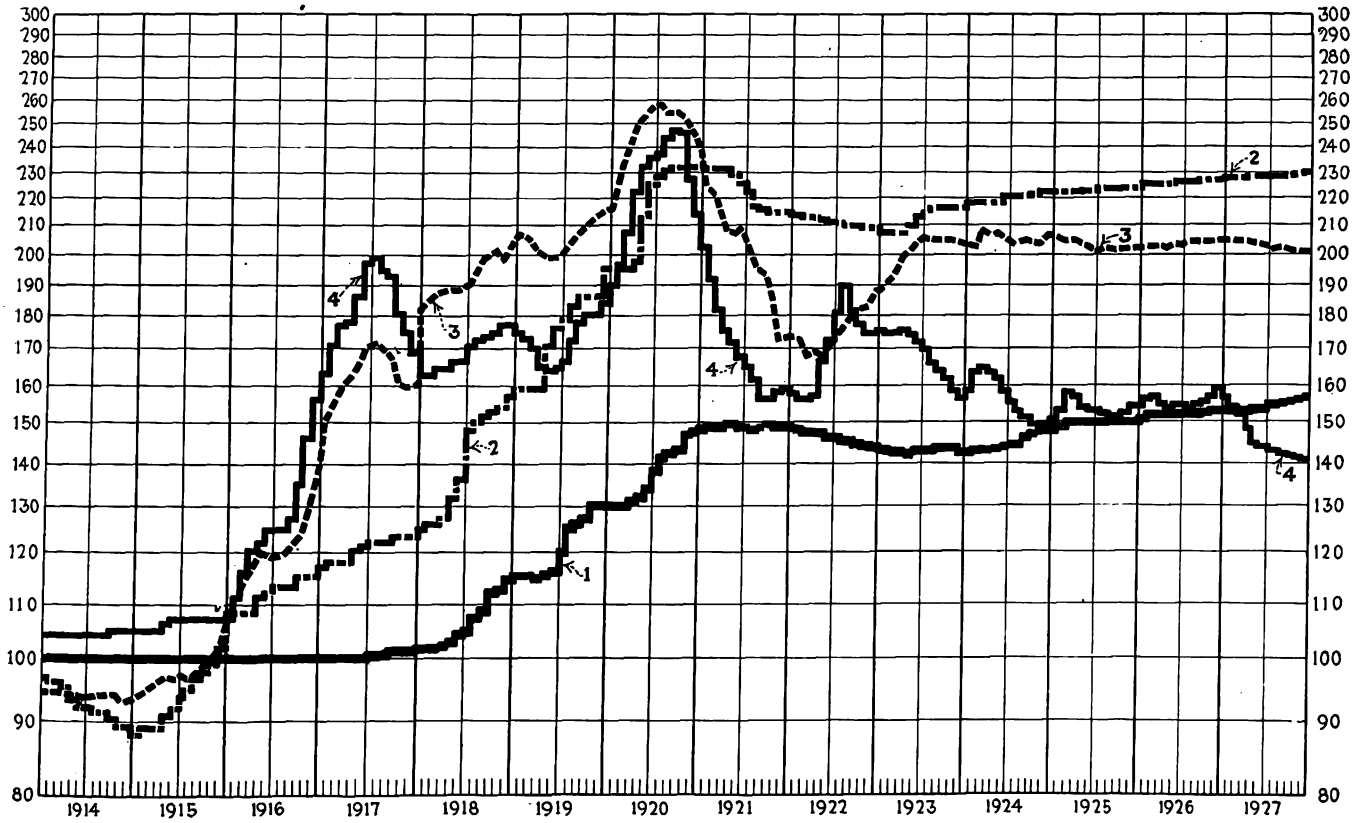
a city-wide flat fare. This general rate plan has great advantages from the public point of view. Judging the practical and the possible by the ideal, the most desirable scheme for the rider and the city would be unlimited transportation, free of cost, throughout the territory served by the system. The next best thing, cost being an unescapable evil, is unlimited transportation within the city at a very low cost. As long as the nickel fare was capable of meeting the cost, no one urged a division of a city into separate fare zones. Only as flat fares increased to 7, 8, 9, 10 cents did the advantages of a low fare zone system begin to outweigh the advantages of a higher flat rate schedule. A conclusion may

use of service; wholesale or retail buying; peak-hour or off-peak demand; special sales. And it is possible that the new factors have grown to a size where they outweigh in importance the considerations of distance and time. In spite of the obvious and overwhelming evidence there is still a lack of appreciation of the profound effect of the automobile on mass transportation in American cities. The change has come overwhelmingly and suddenly. There was a time when everyone rode the street cars and when street car riders could be divided into two classes: those riding from choice and those riding from necessity. The proportion riding from choice, for pleasure mainly, was fairly large. One



Trends of fares, wages and construction costs, 1913-1927 (1913-100)

1. Street railway fares in U. S. cities (Richey); 2. Electric railway wages (Richey); 3. Electric railway construction costs (A.E.R.A.) 4. Electric railway operating materials costs, including fuel for power (Richey)

be drawn from this state of facts: a small increase of a flat city-wide fare, such as from 5 to 6, or from 6 to 7 cents, is from the public standpoint preferable to a zone system. In theory it may appear as of little concern to a utility whether a needed amount of revenue is produced under one rate structure or another. The theory may prove fatal if put to the test. A tariff out of tune with the public's desire, convenience or need is bound to be destructive of the public's good will, regardless of the revenue it may at first produce.

Many Different Factors Affect Fare-Zone Systems

In a zone system of fares distance becomes the controlling factor. Distance and time in city mass transportation service are usually functions, one of the other The question is whether today these functions can and should control the rate schedule. It is certainly true that alongside of length of haul entirely different factors should today be considered, factors emphasized by present-day conditions; such as regular or intermittent

effect of the automobile has been that today there is no appreciable percentage of street car patrons who ride because they want to. People now ride because they have to. In other words, practically all mass transportation is now necessity riding. This fact, if it be a fact, is most important from the standpoint of the rate structure.

The necessity riders, certainly not less than 90 per cent of the total, are either regular riders or occasional riders. The regular riders constitute the financial backbone of the mass transportation business; they furnish by far the largest part of the revenue. The occasional rider is also a necessity rider and represents a considerable percentage of the total traffic, from 15 to 30 per cent perhaps, depending on conditions. When classified in this manner, in the larger cities (of more than 100,000 population), we may safely estimate on the basis of 60 to 80 per cent being regular necessity riders, 15 to 30 per cent occasional necessity riders and 5 to 10 per cent riders from choice.

The question is whether there is soundness and fair-

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ness in a rate structure that charges to each of these riders the same price for a similar haul as far as distance, time and accommodation are concerned. In electric light and power, water, gas and telephone rate making it is a cardinal principle that the service rendered is twofold: the readiness to serve and the product itself. The service charge with these utilities is so definite and recognized as fair that in one form or another it is without question incorporated and accepted in all rate schedules. It is obvious that in communication or in water service there has been a cost incurred, a service rendered and value delivered as soon as the necessary equipment is installed and ready for the potential customer to use, whether he makes actual use of that equipment or not. The house would not be liveable and would not sell without water service, even though the house stands empty. The apartment would not rent, the business would go bankrupt without lighting, without telephone facilities. But if much water is used, much telephoning done, great quantities of power consumed, the cost per unit drops and so does the charge, the rate. The standby charge where reasonably large use takes place may become insignificant and almost disappear in the bill, but it is there. And that is as it should be and accords with equity and fact.

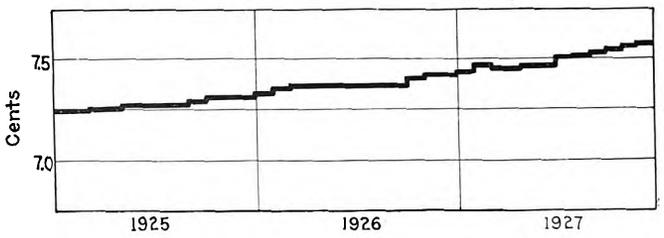
Wherein does mass transportation service differ in this respect from the other utility services? It does not differ. The standby and ready-to-serve portion of the total service is, if anything, more pronounced and more valuable. Much has been said of the effect of availability or non-availability of mass transportation on business, land and building values in our large cities. However much may be said, the effect is likely to be underestimated. In addition there is the effect on the earning power and well-being of every individual in every large city; the effect on time and on space. Truly is it said that the mass transportation system is to a city what the circulatory system is to the human body.

The obvious conclusion to be drawn for this state of things would seem to be this: It is unsound and unfair to put almost the entire burden of the cost of this readiness to serve the entire city and its entire population at all times upon the regular necessity rider and let the occasional rider and the rider from choice to go scot-free. And this is what our present rate structures come to in the majority of cases. The situation is aggravated, from the point of view of the city's economic and social interest, when the fact is kept in mind that the regular necessity rider in the main represents the part of population least able to bear any extra financial burdens and most in need of the safest, speediest and most comfortable mass transportation service and least likely to get that kind of service because he must, of necessity, ride during peak hours.

Relation of Customer to Seller True Basis for Rate Structure

The argument of this article, based on the considerations merely touched upon, is that today's rate structures of mass transportation utilities should be based primarily not on distance, nor time, nor approximations of cost of various services, but on the relation, in regard to service taken and received, of the customer to the seller. If the buyer be a regular, wholesale, dependable customer, making possible the city-wide regular service available to all, then he should benefit accordingly and a rate structure should be devised, if possible, giving him the best possible service at the absolute minimum of cost. On the other hand, the irregular, retail, occasional patron, nevertheless a buyer not from choice but from occasional necessity and whom the transportation utility stands ever ready to serve, should pay for the service he demands and receive not the lowest, but the highest possible rate, the upper limit being an economic one and calling for a rate that will still be advantageous for the occasional rider to pay. There need be no discrimination and the occasional rider should always have the opportunity to avail himself of the lowest rate on the same terms as the preferred regular customer.

In a number of communities throughout the United States rate plans and experiments have been proposed by transportation utilities reflecting such considerations. The commissions have only rarely been willing to permit a full test of a rate schedule on such a basis. As a rule an "intermediate rate" is ordered into the tariff, wiping out a clear distinction between the lowest possible rate for the regular rider and the highest possible rate for the occasional rider. Such intermediate rates not only prevent the possibility of a fair test, but also take away any incentive on the part of an occasional rider to transfer himself into the low-fare group of the regular riders. And so to a large extent the second main purpose of such a rate plan is defeated: the possibility of "selling wholesale low-cost transportation" to every potential rider and to bring the use of the mass transportation system to its maximum capacity and efficiency.



Average street railway fares steadily climbed through 1925, 1926 and 1927. In 1913 the average fare was 4.8425 cents; at the end of 1927 it was 7.57 cents

Attempts to put into effect rate schedules built squarely on such basis are still comparatively rare. However, three important electric railway rate proceedings, dealing with rate structures, have for a year or more been before the California Railroad Commission. They concern the rates of the largest urban and interurban mass transportation utilities of the state: the Pacific Electric Railway, the Los Angeles Railway and the Key System Transit Company. In all three cases the question of the rate structure was a major issue and the problems of zone systems versus city-wide fare, regular and occasional patron versus no differentiation in riders, peak versus off-peak riders, flat rate versus reduced rate and weekly and monthly pass, distance commutation ticket versus flat commuter rate, were before the commission for decision. Exhibits, testimony and discussion on the part of utilities, cities and commission experts was extensive and protracted. The California Commission in its several decisions reached certain conclusions and made certain pronouncements which may be interesting and of value to the entire industry and, whether there be agreement or disagreement, may assist in pointing the way. Accordingly, the decisions in these three rate cases will be reviewed in a subsequent article to appear in an early issue of the JOURNAL.

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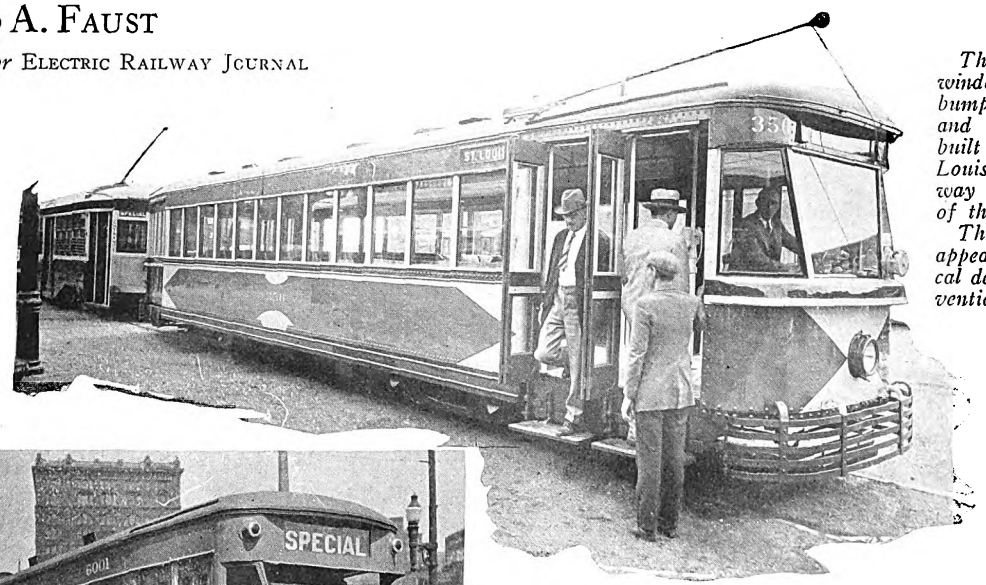
Recent Steps in Car Development

Where Are They Heading?

BY

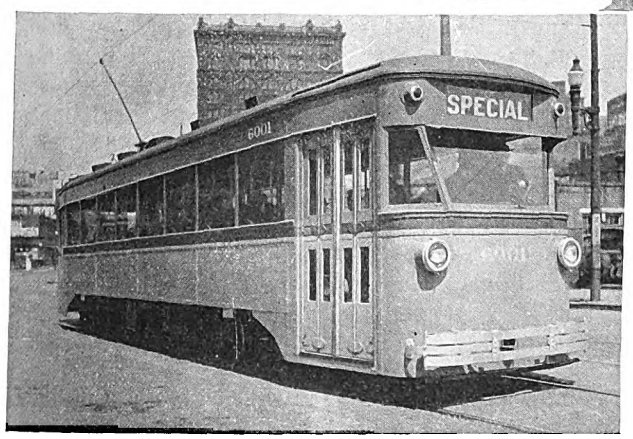
CLIFFORD A. FAUST

Assistant Editor ELECTRIC RAILWAY JOURNAL



The sloping front window and the spring bumpers on both front and rear of the cars built for the East St. Louis & Suburban Railway show the influence of the automobile.

The latest cars to appear with many radical departures from conventional design were the two Pittsburgh experimental units shown at left.



ACTUAL developments in recent cars indicate a decided trend toward the creation of speedier and more comfortable vehicles designed to attract electric railway patronage

DYNAMIC braking, regenerative heating, remote control, roller bearing axles, automotive drive, high-speed motors, deep-cushioned, bucket-type seats, inclosed vestibule cabinets, sloping windshields; these and many other radical ideas in electric railway cars have made their appearance in such a comparatively recent period and have been presented in such rapid order that many railway men have lost trace of the important changes. It would be well, then, to analyze the developments, gain a picture of what has happened recently and determine just where these developments are heading.

The list of recent cars showing important departures from conventional practice is a long one. It includes the Grand Rapids cars, the high-speed interurbans built by the Cincinnati Car Company, the Springfield and the Chicago & Joliet experimental cars, the Cleveland Railway aluminum unit, the Houston interurbans and the cars for the Houston Electric Company, the East St. Louis rail sedans, the Brill 1928 model, the Pittsburgh experimental cars and the sample car of the Osgood Bradley Car Company for 1929. These have appeared in such rapid succession that it has been difficult to follow the distinctive trends. Each car had several outstanding new features of design and some of them incorporated many ideas never tried before in electric railway equipment.

Both city and interurban cars have shared in this development and some of the present models are radical departures from their predecessors. The chief objective in all of the new cars was to increase their attractiveness to passengers with an ultimate view toward greater revenue. They were built to operate economically, but more attention was paid to making them attractive, comfortable and sturdy vehicles to meet present-day competition and to attract more riders. This represents a definite move by the industry to regain its lost patronage and to meet the competition of the automobile. The industry has taken very definite steps to improve its product and present indications are that this progress is to continue.

Before venturing any speculation as to what the cars of the future may be, it is well to review briefly the individual developments in the recent cars that have contributed toward the creation of a more salable transportation product.

Perhaps the most desirable characteristic of any transportation vehicle is speed. In this day, when people

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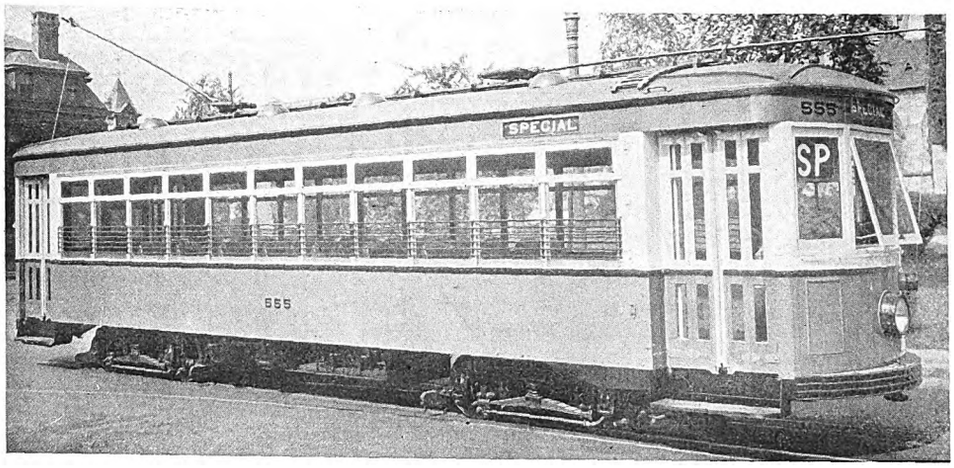


In the Springfield-Worcester cars, manufactured by the Wason Manufacturing Company and the Osgood Bradley Car Company, particular attention was paid to obtaining a streamline effect in the body design and color scheme

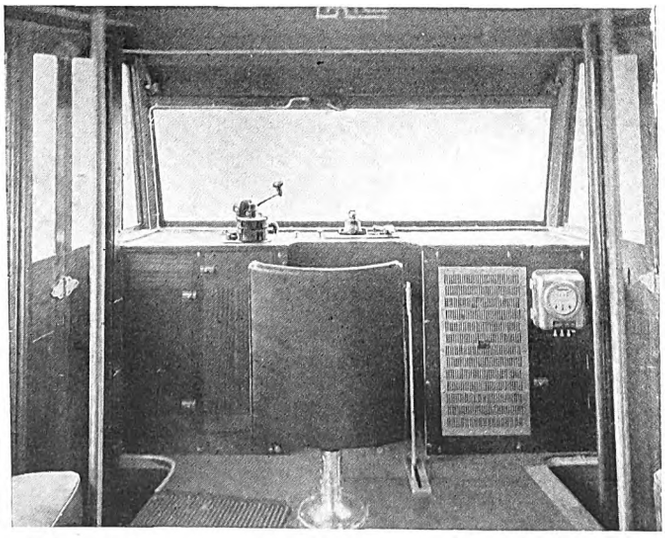
figure the time required to get from home to office down to the minute, it is necessary to provide an unusually fast service to retain and attract riders. In almost every new car that has made its appearance speed has received particular attention. Rates of acceleration and braking have been increased considerably and cars have been made lighter by using high-speed motors of less weight and by using aluminum and duralumin in the bodies. The aluminum body car of the Cleveland Railway weighs only 30,300 lb., which is 12,900 lb. less than the company's standard car of the same dimensions. A six-wheel unit, using aluminum extensively in the frame, was developed by the Versare Corporation and was placed in service in Grand Rapids. Only recently the St. Louis Public Service Company acquired a number of cars with duralumin frames.

For many years little was done to increase the acceleration of cars. In recent design, however, much attention has been paid to getting higher acceleration and braking rates, and as a result many changes have been made. Lighter weight for given motor capacity, of course, has contributed toward higher acceleration. But the most significant move has been the development of the high-speed motor and automotive-type drive. The method of suspending this type of motor permitted the use of higher armature speed and therefore gave materially lower weight for a given capacity. This equipment also made possible the use of smaller diameter wheels.

Fully as important as the acceleration rate in giving a higher average speed is the retardation or braking rate. Many entirely new types of brakes have been tried on the recent car models. One of these is the internal expanding automotive-type brake developed by the Timken-Detroit Axle Company and used on the new type trucks of that company. Automotive-type brake diaphragms, actuating conventional brakeshoes on the wheels, were used on one of the two Pittsburgh experimental cars and on the Osgood Bradley sample car.

Dynamic braking is being tried on the Chicago & Joliet car. It also is included on the Pittsburgh experimental units. In addition, a number of the recent brake equipments are electro-pneumatic, to eliminate piping in the vestibule and to eliminate time lag in application. The variable load device of the Westinghouse Company, though not classified as one of the more recent developments, has nevertheless been included on many of the new cars to permit more uniform braking and consequently faster braking rates.

Combination air and magnetic track brakes of the Cincinnati Car Company are used under some of the light-weight, high-speed interurbans developed by that company and also under city equipment, notably in Lexington, Ky. Although the idea of track brakes is not new, this application in combination with air brakes and the safety car brake equipment is distinctive. The magnetic shoes are actuated directly from the trolley and controlled through the M-28 brake valve in combination with the air brakes. The stopping distance has been decreased in tests from 21 to 46 per cent in comparison with air brakes alone.



It has been possible by the use of remote control fully to inclose all platform equipment. This view of the vestibule of the Brill 1928 car shows the neat effect obtained

Steps to Increase Passenger Comfort

Many refinements have been included in recent cars to give a more comfortable ride. Most of the recent cars incorporate deep-spring, leather or plush upholstered seats of the bucket or semi-bucket type. These are in sharp contrast with the types of seats which were standard for many years.

Aside from improvements in the seats themselves, there have been some radical changes in seating arrangements. The Pittsburgh Railways has been experimenting for some time with seating arrangments and, in its two most recent cars, located the bucket type seats in single rows along the sides of the cars at an angle of 45 deg. A similar plan is being tried by the St. Louis Public Service Company. This arrangement gives a greater degree of individuality and provides wide aisles for handling passengers in the rush hours.

Other important factors in securing comfort are good heating and ventilation. Although car heating and venti-

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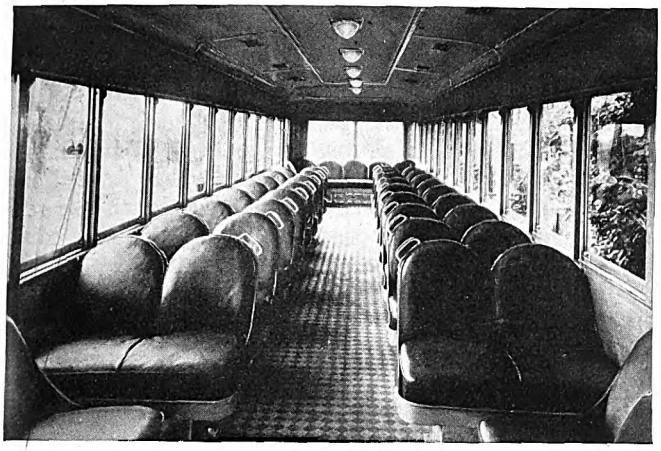
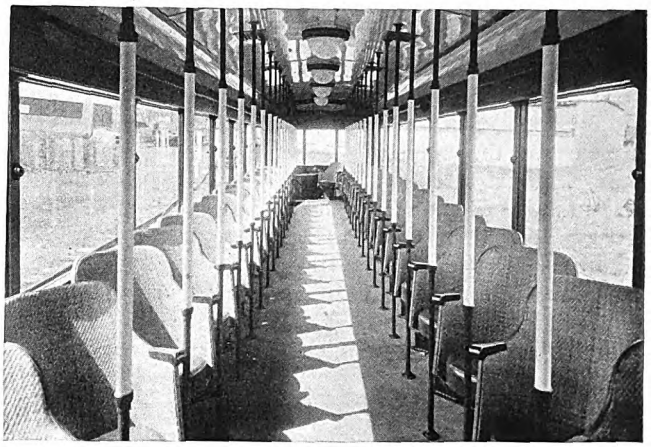


Twin, leather-upholstered seats, a wide aisle and bowl illumination give the interior of the Joliet car manufactured by the Cummings Car & Coach Company a restful atmosphere of comfort and dignity



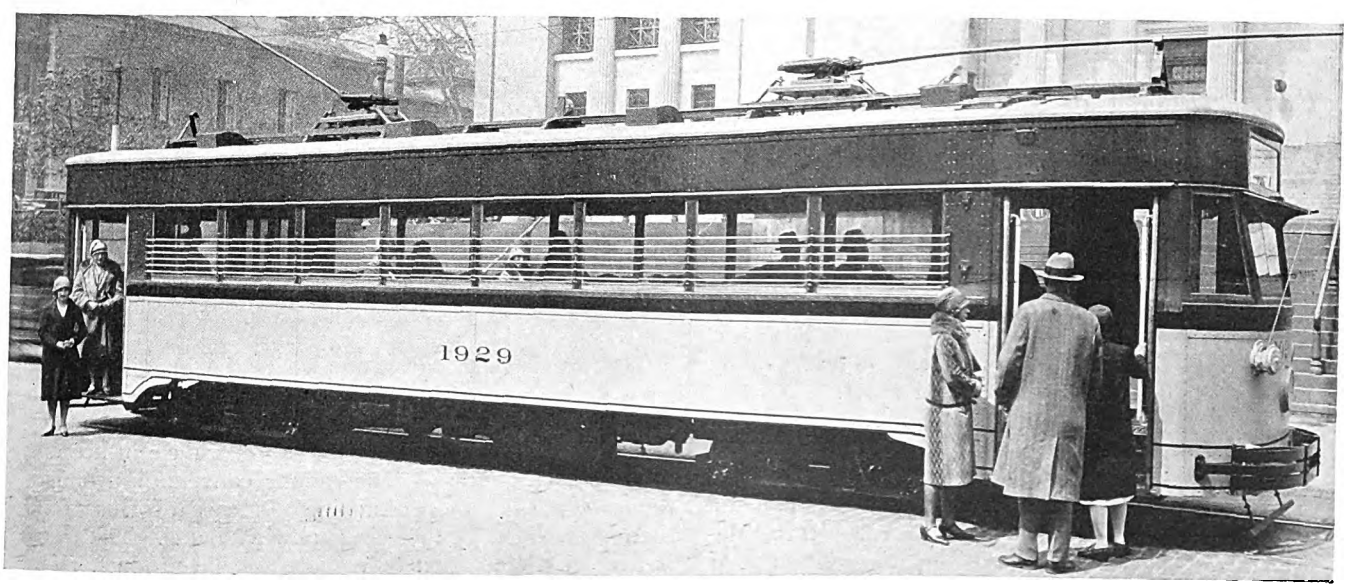
Bucket-type seats in the two Pittsburgh experimental cars are arranged in two single rows at an angle with the car side, giving the passengers an air of individuality. The long side windows are another innovation

lation have been developed to a high standard of performance for a number of years, the most recent step is the utilization of the heat available from the starting resistors. In some of the recent cars these are located within the body and in a number of instances, as for example in the Joliet and Pittsburgh cars, the energy from dynamic braking also is utilized for heating.

Noise always has been associated closely with the old-type street cars. It was not until the private automobile became popular that this subject began to attract serious attention. The demand for more quiet cars has resulted in the use of many noise absorbing and reducing devices and designs.

Perhaps the most significant step in noise reduction has been the design of trucks using high-speed motors and the several new types of drive. On these the motors have been suspended from the truck frame instead of from the axle. This has produced a considerable reduction in noise, particularly over special work and joints. Rubber shock insulators are being used for the elimination of many incidental noises. Springs of different design and considerably longer than the usual type also have contributed to easy riding and reduced noise. Chattering brakes and clanking brake rigging have always been very annoying. Many changes from conventional brake design have been tried with a view toward reducing noises. The most important of these are perhaps the several designs of automotive-type brakes and special brakeshoe materials. The use of brake diaphragms directly connected to the operating mechanism in place of the conventional cylinder and foundation brake rigging has eliminated many of the sources of noise in rods, levers and pins.

Gears, wheel flanges and trolley wheels are other sources of objectionable noises. Mounting the trolley bases on springs largely eliminated the trolley wheel noises within the two Pittsburgh experimental cars. Gear ringing has been reduced by the use of asphaltum pads bolted to the web sides, rubber pads bolted to cast-steel wheels through cored holes in the webs, and filling hollow webs with special material. A recent development by the Tool Steel Gear & Pinion Company includes the use of sound-deadening metal poured into grooves cut in the steel gear.



Pleasing appearance, quiet operation, rugged construction and low maintenance cost were objectives of the Osgood Bradley Car Company in the design of its sample car to meet 1929 transportation requirements

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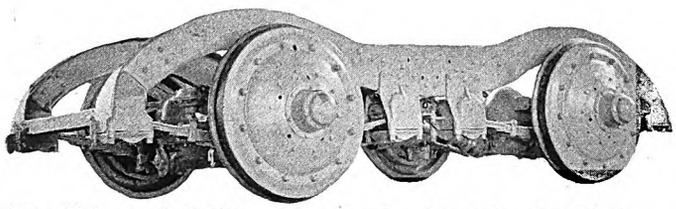
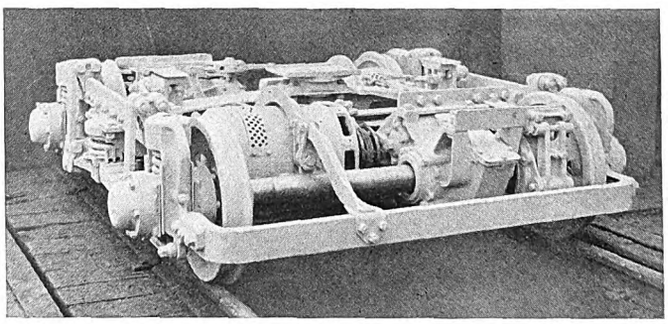
In addition to reducing the noises underneath the car floor, special materials are being used to insulate the car interior from truck and rail noises. Several materials have proved effective for this purpose.

Making the cars more convenient to use is an important part of the industry's general merchandising program. Special attention has been given to destination signs in many of the newer models, an excellent move in securing new patronage. Although low floors have been an objective of the designer for many years, the previous limits have been dropped even further through the use of high-speed motors with new types of drive. The Brill 1928 car with 22-in. wheels has a floor height of 28¾ in.



The Chicago & Joliet car trucks, developed by the Timken-Detroit Axle Company, have semi-elliptic springs, high-speed motors and automatic-type drive. Spring-suspended motors, less noise and less weight are advantages of this design

and requires only two steps. In other models where three steps have been necesary, the first step has been made as low as possible. Automatic, treadle-operated doors have been almost universally adopted on recent cars. This is because most of the experimental cars are arranged for one-man operation.



Spring suspended motors, small wheel diameter and quiet, oil-inclosed gearing are obtained with the Westinghouse W-N drive as shown here on a Brill truck

Within the cars, several improvements have been made for the convenience of the passengers. Windows that do not open easily are a frequent source of annoyance to passengers. To obviate this, in one of the new cars, balancing springs to counteract the weight of the window were installed.

Car Appearance Has Been Greatly Improved

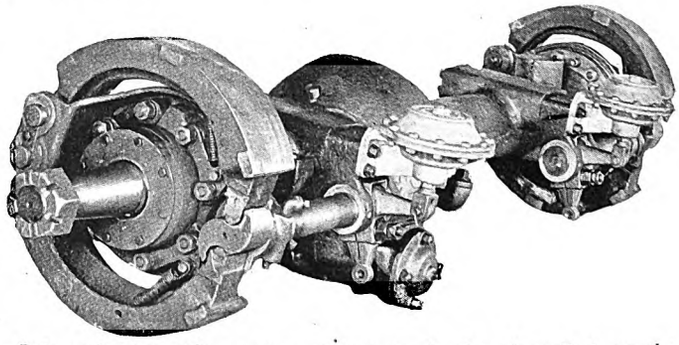
The previous discussion has dealt particularly with the developments that have contributed toward greater speed, comfort and convenience. Realizing that most people "judge a book by its cover" recent car designs also have given particular attention to improving the exterior appearance. In general the cars have been made lower and more racy, with fewer sharp angles and curves and more attractive color schemes. The effect has been increased by painting the cars to accentuate streamlines, and by using long windows and lower-arched roofs.

Many traces of automobile design are found in the new street cars. This is particularly true of the car fronts with their two headlights, spring bumpers, sloping and large, one-piece windshields, window wipers and sun visors. The general effect represents a considerable departure from previous street car standards. The use of gaudy colors on the car exteriors is gradually giving way to more harmonious color schemes.

Car interiors, for many years given only passing attention, are now receiving intensive study. They have been made more pleasing by the use of dome lights, attractive finish and colors, long side windows, floor materials of inviting design and leather and plush upholstered seats.

Remote control of both motors and brakes have eliminated much of the bulky equipment formerly carried on the car platforms. In most of the new models the remaining equipment has been inclosed in very neat cabinets so that the vestibules are fully as attractive as the remainder of the car. The substitution of copper and aluminum tubing for piping not only has decreased the labor of piping installation and repair, but also has made it possible to eliminate much of the exposed piping.

There are many other developments that have not been mentioned. From those that have been included, however, it is not difficult to analyze the present trend in car design. Car operators are seeking worthy rivals for the automobile. Recent progress indicates that street cars can be successfully developed to compete in comfort with the automotive vehicle. They are seeking speedy cars with which to meet the public's demand for rapid transportation. Faster schedules are easily made with some of the more recent models. They are seeking quieter cars. Present progress indicates that quietness is not incompatible with speed and operating efficiency. They are seeking better appearing cars. Present progress indicates the possibility of including beauty in the car designer's art. More comfort, faster operation, quietness and appeal to passengers; these are the objectives of present trends—to say nothing of increased efficiency and economy.



Internal expanding automotive-type brakes installed on the Springfield experimental car. The brake shoes are of special bronze composition and are actuated by a cam shaft

The progress so far made whets the imagination of transportation men. The street car is undergoing a metamorphosis from an ugly and noisy thing of utility to a beautiful and quiet transportation vehicle in keeping with its surroundings. The coming convention promises to develop even more startling evidence of this trend than is provided by those cars now available. The trend is toward the creation of a more salable product. The modernization era is paving the way for the merchandising era which is just getting well under way.

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Selling the Car Rider *In Print*

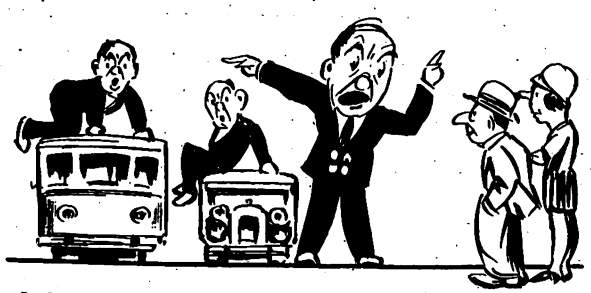
BY

LABERT ST. CLAIR

Director of Advertising
American Electric Railway Association

Modernization in the electric railway industry is not being confined solely to cars. There also is a marked modernization movement in transportation advertising and selling

STRIPPED of all mystery and bunk, advertising is simply selling goods on paper. Fortunately for the local transportation industry, real salesmanship rapidly is replacing mere institutional or good-will advertising in local transportation copy. Local advertising managers are striving earnestly to induce the public to



Induce the public to climb on electric cars and buses

climb on electric cars and buses rather than to climb on the public utility good-will band wagon.

The foregoing must not be taken as a criticism of good-will advertising. Certainly it has a very definite place in the scheme of selling. There was a time, some eight or ten years ago, when it very properly dominated all local transportation advertising copy. The reason for this was that the industry had not been an advertiser, had suffered many reverses which the public did not understand, was giving a poor quality of service and therefore was in no position to try to sell rides. The initial problem was to get the public in a favorable frame of mind. To accomplish this it was absolutely necessary to devote at least nine-tenths of advertising space to informational or good-will advertising.

Now that the public understands the industry's problems quite thoroughly, improved service is being given generally and the problem is to get the people on the cars, the ratio of sales advertising to good will might well be reversed. Nine times as much copy for selling as for good will seems to be about the proper ratio.

When I speak of copy I use the term in the broadest meaning. This refers not only to newspaper space but also to company mediums, billboards and other channels. The idea that you are not advertising unless you are paying a high rate in some daily newspaper is erroneous. While the advertising section of the American Electric Railway Association thoroughly indorses newspaper advertising and believes that the proper sort of copy used in the daily press will bring returns, it also urges all companies to make the best use of their own channels.

Before discussing in detail current changes in copy styles, I want to go behind the prepared copy and note the encouraging change in organizations with respect to co-operative selling effort. The fact that the industry as a whole is recognizing the necessity for co-ordinating the efforts of all departments in any selling campaign and not depending on advertising alone to bring out success is a definite sign of progress.

Time was, and not so many years ago, when the advertising department of many an electric railway was regarded as a none too beautiful stepchild; in truth, advertising was looked on in many organizations as a rather necessary evil which might possibly bring in some returns, or a left-handed job for somebody to take care of when there was no such important thing as buying the correct grade of gravel to be disposed of. I recall very distinctly having gone to the Middle West some six years

A none too beautiful step child

ago to aid a company on the verge of bankruptcy in preparing an advertising campaign and being unable to obtain more than a few minutes of the general manager's time because he was busily engaged in buying a couple wagonloads of gravel. He argued over the gravel for something like half a day and devoted a few minutes at lunch time to his advertising problem. Later there was a change in management and the new head of the property thought it worth while to come to New York and spend two days looking over all the electric railway advertising that the association had gathered in recent

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years. Fortunately, the former sort of a manager is not much in evidence nowadays.

It should be obvious to everyone in the industry that traffic cannot be increased unless the selling effort is co-ordinated from scrubwomen to presidents. Any sales campaign will be just as weak as its weakest link.

Back of all selling, of course, must be good service as well as co-ordinated personnel management. This is proved in other lines every day. It is being proved right now in the national political campaign. If you recall, one of the first things that the heads of the two outstanding national committees announced was that they would try to sell their political goods on merit and not by knocking the other fellow's products. It remains to be seen how far they will go in carrying out these promises, but undoubtedly the theory is good. In selling anything, whether it is candidates for political office, pumpkin pie or electric railway or bus rides, the best sort of salesmanship is to sell your own service and not try to run down the other fellow's. This paragraph is injected at this point purposely to discourage in the beginning all types of "knock" advertising. There has been entirely too much of it in the local transportation business. The sooner it is killed off altogether, the quicker business will begin to grow.

Advertising Is on the Increase

The volume of local transportation advertising is increasing greatly. Only recently the association obtained reports from some 400 of the largest cities in the United States in regard to advertising and non-advertising companies and the growth was appreciable. It is impossible now to tell just how much is being spent actually for advertising and selling, but a year ago the annual expenditure was about $6,000,000. That represented a growth of about $1,000,000 a year during the last six years, and it is the advertising section's belief that the growth during the last year has been up to that of former years. If this is true, it is probable that about $7,000,000 was spent

Kill off the "knock" advertising

for all forms of local transportation advertising during the last year.

A request made several months ago for samples of advertising material to put in the association's loose-leaf folder brought about 10,000 pieces of local transportation advertising to A.E.R.A. headquarters. Some 2,500 pieces of copy were selected and reproduced in the loose-leaf folder. This supplement to the original folder of 2,500 pieces of copy now has been sent out. As a result, there is today in the hands of every electric railway company in the United States a folder containing some 5,000 pieces of copy. The most casual glance through this recent copy will show that the managements are stressing the three big sales points—safety, comfort and economy.

The stressing of the safety feature of electric railway riding has been notable during the past year. This is good business, and has been aided by several outside influences. For instance, motor car accidents are constantly on the increase. The national death toll is now about 25,000 a year and nobody knows how large the accident toll is. The result is that people generally are talking of the dangers of motor car riding, as well as the inconveniences, and it is good business to draw to their attention the fact that riding on street cars is safe. This sort of advertising also is productive of much

The comforts of electric car riding in contrast to driving an automobile

school riding. Parents want to see their children reach school in safety and, say what you please, the women of this country do have confidence in electric railway conductors.

It was interesting to note that out of several hundred pieces of copy submitted to the Public Utility Advertising Association's contest for the best piece of railway copy produced in the country last year, one referring to the services of conductors won first prize. While Mr. Storrs and myself sat on that committee, we purposely refrained from expressing any opinion as to what was the best piece of electric railway copy. The other men on the committees were representatives of power and gas organizations and advertising agencies. They were unanimous in selecting the piece of copy that stressed the safety of car riding and the personal service of conductors.

National publicity given to the fact that only one passenger out of 155,000,000 was killed by electric railways during the year preceding the granting of the Anthony N. Brady Award also was of great supplemental assistance to this type of advertising.

The comforts of electric car and bus riding in contrast to driving a private automobile in traffic have been strongly emphasized in copy. Here is a type of copy which illustrates the point made earlier in this article about selling your own goods on merit rather than knocking the other fellow. It is much easier, of course, to write copy pointing out the grief that comes to the motor car driver, but isn't it much better salesmanship to point out the comfort and happiness that comes to the user of electric railways? I do not mean by this that the discomforts of driving a private car in congested streets should be entirely ignored. In fact, one series of posters prepared by the advertising section this year dealt with that very subject. But one should not devote his entire time to hammering his keenest competitor, the private automobile.

Several million words have been used in discussion of whether it pays to advertise the economy of using public transportation. Personally, I believe that it is the weakest of the three arguments. Of course a penny

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additional fare means a great deal when it is proposed to raise street car fares in any city, but a few pennies make very little difference to the fellow who owns a motor car. The fact that he has bought a motor car shows he is willing to go in for luxury. Economy of riding should be stressed only when it can be tied in with a definite selling campaign, such as books of tickets or tokens in

Locate sales stations in cigar stores

quantities. General dissertations on the economy of electric car riding are not of great value.

Right in connection with this phase of the situation it should be pointed out that local transportation companies are notably weak in supplementing their advertising with direct sales of tokens and tickets. There may be half a dozen street car or bus companies in this country that are thoroughly covering their territory in a sales effort to get tickets into the hands of their customers in quantities, but the number does not exceed that. Sporadic attempts have been made on a few occasions to make house-to-house canvasses, but this fertile field remains greatly neglected. We are still hopeful that some day companies will give their men, or members of their men's families, an opportunity to sell tickets and tokens on a commission basis and thoroughly organize their towns for this sort of persistent and regular salesmanship.

The least that companies could do would be to locate numerous sales stations in cigar stores and other convenient places. While some effort has been made along this line, the number of managements which have well-established, clearly-indicated and well-advertised sales stations for tickets or tokens is few indeed.

Consistent Efforts Will Win Recognition

The consistency with which companies are advertising is cause for congratulation. The only kind of advertising which really pays is regular advertising. This has been a difficult point to register with the industry, but it is getting over at last. Far too many companies have continued the old practice of using full pages when they were in trouble and nothing when they were on "Easy Street." The tendency is growing, however, for companies to change their copy regularly and to make it interesting. This is especially true in the use of car posters and company leaflets. Most of the companies using these mediums nowadays change them on a regular schedule. Newspaper copy also is being used more frequently. The old type of huge electric railway advertisement which was mostly white space and large type is disappearing. For this everyone should be profoundly grateful. Likewise, the illustration which had nothing whatever to do with the text has passed out also. A great many companies are making good use of their local artists and advertising agencies in the preparation of real selling copy which is well displayed typographically and which has illustrations that fit the text.

A striking illustration of this point is found on a mid-Western property which is trying to sell the token idea. Some genius on the property in looking a token full in the face recognized the fact that the corners of its mouth turned up. Therefore he began to use the slogan, "Even the Token Smiles at You." This kind of advertising is mighty hard to beat. The great trouble is that on too few properties do the men care who are writing the copy, or the executives who are passing on it look about with clear eyes to see what they can sloganize or dress up with a local appeal. There is something on practically every property which will lend itself to such treatment. The way to find it is to look around. Nobody at national headquarters, or no one in an adjoining town or state, can see the thing on a local property which will attract attention, but the man who is sitting on the lid can if he will just look carefully.

Fewer words are being used in copy than formerly, a distinct evidence of progress. The advertising man who can get one idea across in a single advertisement has done a good day's work, and there are very few single ideas that cannot be expressed in a hundred words. Many of them can be expressed in less than that. The writer got a genuine thrill during the year in having a hand in one campaign of 25 pieces of copy none of which carried more than ten words. The illustrations and a few words told the whole story. And, fortunately, the management for which the copy was being written was willing that the copy writers should stop when the story was told.

One reason why it was possible to write this campaign in so few words was that the management selected one man to pass finally on the copy and stood by his selection. Two heads may be better than one in a great many things, but few things are worse than a hydra-headed copy committee. It is no wonder that many copy writers prefer jumping into the river and ending it all

Even the token smiles at you

rather than submitting their efforts to eight or ten different men on a property.

A new departure is the use of the rotogravure section. This is very expensive advertising, but is good, especially if you have a de luxe proposition to offer. In the introduction of new coaches or buses, the opening of a new line or anything else that smacks of a classy improvement, the rotogravure sections are very good indeed. They are not recommended for use in connection with the discussion of your current tax problems, or similar weighty subjects.

Experiments with the radio for advertising purposes have been somewhat broad during the last year, about a score of companies using it. Opinions differ on the value. About a dozen companies believe that the radio is worth while; the remainder are not sure. It is a notable fact

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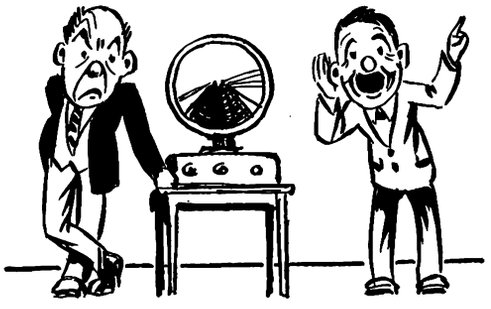
that the largest electric railway broadcasting station, WEBJ, conducted by the Third Avenue Railway, was discontinued recently on the company's own initiative. The company felt that it received good value for its money, but it was not disinclined to give up the radio when there appeared a public need for its space. A very enlightening and interesting article on this subject was

Few things are worse than a hydra-headed copy committee

written by Miss Mary A. Burke of the association staff and printed in the July issue of *Aera*. In it she dealt in detail with the different stations. It would be worth while for anyone interested in radio advertising to read this article.

Generally speaking, it is the writer's opinion that for local transportation company purposes the regular use of the radio as an advertising medium does not warrant the exceedingly high cost. This does not mean that the radio does not have advertising value in many lines, but local transportation companies, with limited advertising appropriations, probably could use their money more advantageously in other ways.

While on this subject of economical use of advertising appropriations, it might be worth while to suggest a survey of every electric railway to determine if all company channels are being used to the utmost. This form of advertising is the cheapest and best possible. Window signs, leaflets and company publications, signboards and other mediums cost very little in comparison to newspaper, radio and billboard advertising and they yield mighty big returns. The grass in the other fellow's pasture always looks mighty interesting, but frequently we are trampling clover filled with sustenance under foot when we are gazing across the landscape. Watch your own channels.

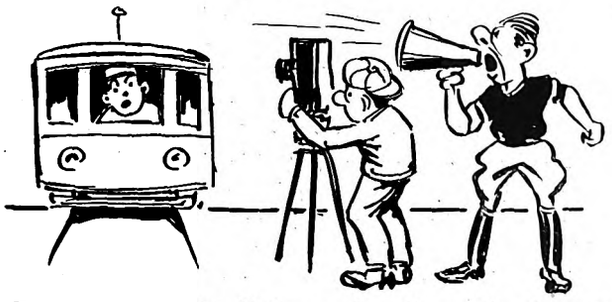


Opinions differ on the value of radio

Real progress is being made in the use of movies and still pictures. Movie development has been slow in the industry and there has been a good reason for it. For a long time it was almost impossible to get a constructive suggestion from a movie man regarding anything that would be helpful to the industry. I remember on one occasion when a widely-known director came to association headquarters and suggested the expenditure of $8,000 on a film built around a scenario with a very deep love plot and which he regarded as a knockout. The high point of the scenario, as I now recall it, came where the hero motorman defeated the purpose of the wealthy street car magnate to get a franchise for nothing, and in addition, carried away his starry-eyed daughter and married her before a prominent justice of the peace. Other scenarios were equally bad.

During the last year, however, some commendable pictures have been made. The Chicago Surface Lines has produced three excellent films, and, with its usual generosity, has permitted the association to take prints of them for distribution throughout the industry. Likewise, the United Railways of Providence, the Birmingham Electric Company and the Chicago Rapid Transit Lines have been exceedingly helpful in aiding the advertising section to start a motion picture program. Thanks to this cooperation, the association at a very small cost has assembled about 25 different films, dealing with safety, the readiness of the industry to serve, traffic congestion, the comfort of street car riding, and taxation. These films have been offered to the industry at a low rental and have been shown more than 700 times since the last A.E.R.A. convention.

A large number of companies also have produced local



Every company should have a few films of local scenes

films which were helpful in their communities, but which could not be used nationally. Every company should have a few films containing local scenes. They are not expensive if care is used in the production of them. The best plan is to write a scenario on your own property, employ a local commercial movie man to make your picture and then cut it to suit yourself. Calling in an outsider to help you on a scenario usually is a waste of time and money, because he will get so much extraneous matter in it that you will have to do the job yourself anyhow. The best plan is to think out a simple story that you want to tell and then tell it in the fewest possible pictures. Don't make the mistake of trying to cover more than one subject in a picture, and confine your story to about 1,000 ft., or one reel of film. This will run from ten to twelve minutes, and that is about long enough for a propaganda picture.

There has not been the demand for still projection pictures which the association had hoped for. An arrangement was worked out whereby still films could be produced cheaply, but, for some reason, the industry did not accept it. Information regarding still picture production is on hand at association headquarters and will be furnished gladly.

Summarized, the year has been an encouraging one from an advertising and a selling standpoint. Better work is being done in many directions. The chief need is closer co-operation between all departments in unified selling.

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Bus loading stand of the Penn-Ohio System at Central Square, Youngstown

Fact, Not Fancy

Must Guide in the

Use of the Bus

BY

R. N. GRAHAM

Manager of Railways
Penn-Ohio System, Youngstown, Ohio

ESTABLISHED transportation companies accepted the motor bus as a definite factor in city transportation eight years ago. The way for the new vehicle apparently had been blazed by the jitney, which originated on the Pacific Coast in 1913 and which within a few years spread over the entire country. The use of the jitneys, however, was a self-limited disease, as it violated fundamental economic laws. It was not economically sound for a community to support two transportation agencies performing the same work, nor was it sound to support the agency furnishing transportation to the smallest number of people.

Nevertheless, the jitney in the United States at least blazed the way for automotive mass transportation. The war produced a great development in the manufacture and riding qualities of motor trucks. As a direct consequence, with the close of the war some automobile and truck manufacturers pushed the use of buses and they soon became recognized transportation units.

In the beginning, the bus was looked upon in a great many quarters as the successor to the street car. The logic of those that took this view was simple and easy to follow. They argued that just as the electric car had succeeded the horse car, so would the motor bus supplant the street car.

Somewhat to the surprise of the unthinking public, there was no serious effort on the part of the established street railway companies to discourage the use of the motor bus. When the electric car superseded the horse car, it was not through the development of new transportation companies whose competition destroyed existing horse car companies; the same corporate organizations that had started their business venture with the

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use of the animal-drawn vehicle gladly availed themselves of the new development. Similarly, the manufacturers of motor buses early found that the largest customers for the new vehicles were the established street car companies.

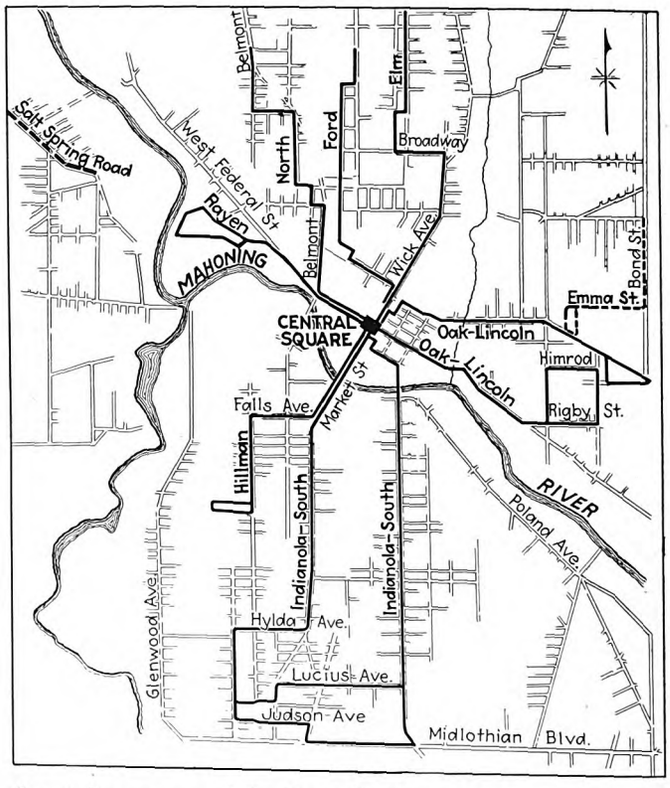
However, after eight years intensive development of the motor bus, it seems fairly certain that the bus is in no sense a successor to the electric car. There are many uses for the bus in urban transportation, but the day is distant and probably will never come when mass transportation can be given by the agency of the motor bus alone.

Today, practically every urban transportation company will find in its system a field for the bus and a field for the street car. To understand the proper use of each of these transportation mediums, it is necessary to devote a little attention to the changes that have come over the transportation business within the past decade and then to examine closely the characteristics of each of the vehicles available.

As late as ten years ago, for all except short distances, the vehicle of practically all inhabitants for carriage to and from their homes either for work, pleasure or business, was the street car. At the present day, a very large proportion of the families formerly so dependent upon public methods of transportation are supplied with private automobiles. The use of the private automobile by these families has not eliminated the need for public transportation agencies; it has simply altered the characteristics of these agencies.

Formerly the population of any given transportation line could be considered as dependent upon that line for their carriage. As the use of the automobile increased, the ratio of rides for each member of the population so served by a given line, decreased, so that the net effect of the increased use of the automobile is, as far as the transportation given is concerned, a thinning out or decreasing of potential customers on the line. This being the effect of the private automobile, let us see under what conditions the bus can best be used and under what conditions the street car can best be used.

There have been enough companies seriously engaged in the use of buses to determine with a fair degree of accuracy what costs may be expected of the two classes of vehicles. The use to be made of each type may be determined by these costs, unless there is a substantial difference in the number of passengers that would be attracted by the use of one as compared with the other.



Seven bus routes of the Penn-Ohio System are now serving the city of Youngstown, Ohio. The Emma Street and Salt Spring Road routes, shown by broken lines on the map, have been discontinued

Operating costs are definite and certain. If the use of the street car as compared with the bus in given situations depends upon these costs, the test can be made very simply. If there is a substantial difference in the number of passengers that will be attracted, it will not be as easy a matter to draw conclusions, as the question of attractiveness is more vague to reduce to specific figures than the question of cost. It certainly would simplify the problem of picking the place to use the bus and the place to use the street car if this question of attracting customers could be dismissed. It is my opinion, based upon years of what I believe to be close observation, that this consideration can be dismissed.

In the city of Youngstown in the year 1927, we op-

Queue loading of buses at Rayen High School

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erated 3,663,680 street railway miles on nine lines and 2,129,217 bus miles on seven lines. Each of the lines extends to the center of the city and nowhere is any line competitive. On this property we also have a number of suburban street railway lines and suburban bus lines. In some cases the bus lines serve the same suburbs as the street railway lines.

After using the bus for six years, there is not one single factor that indicates that, the service being equal, there is any substantial preference on the part of the public of Youngstown for either the bus or the street car.

In the experience with our suburban lines, during the same period, there have been indications of marked preference, but in every case, when analysis is made, it is found that the preference arises from some quality in the service that is not peculiar either to the bus or street car and that there is nothing inherent in either the bus or street car that forbids this quality.

There are installations in cities in this country in which a double service is given over the same streets by buses and street cars and in which higher fare is charged on buses and they are being well patronized. However, even in these instances there are differences in service which are not necessarily inherent. Let us examine some of these differences:

1. As a general rule buses have been equipped with better seats and have been decorated a little more handsomely inside and outside than street cars. I believe it will be conceded that there is nothing in the dimensions or shape of the bus that makes it inevitable that it should have more comfortable seats or be finished in better quality than the street car. On the other hand, I believe it will be conceded that it is possible to equip street cars with very much more comfortable seats than it is possible to have on a bus and that they can be made as pleasing in external and internal appearance.

2. In some cases it has been found desirable to schedule buses at a higher rate of speed than street cars engaged on routes covering the same streets. Again, it will be conceded that the higher speed is not an inherent quality of the motor vehicle. With properly designed equipment and proper personnel, it is just as possible to acquire quick schedules on street cars as on buses.

On the Youngstown property, we have had every obstacle to a reasonable speed to be found on a city property; narrow streets, grade crossings, bridges, congested centers, experimental traffic regulations and all the other phenomena of this character so familiar to railway managers. In the year 1926 our buses had an average schedule speed of 9.3448 m.p.h.; our street cars for the same period had an average schedule speed of 9.0942 m.p.h. A considerable part of our equipment is Birney cars, which are not well adapted for use on certain lines. The substitution of modern, light-weight, quick accelerating cars for these Birney cars will bring the average railway speed up to the average bus speed.

Typical street car type buses at the loading stand in front of the Court House on Market Street

We have had on this property for the past year a splendid opportunity to test out fully just what the "rubber urge" really means when street cars and buses are competing under entirely similar conditions. The city of Struthers is situated 4 miles from Youngstown. The street railway line from Youngstown to Struthers is double track the greater portion of the distance. Service is given with modern, light-weight cars, one of which was on exhibition at the A.E.R.A. convention in 1926. These cars have rubber floors, dome lighting and comfortable leather seats, are operated on a snappy schedule and have been kept in good condition inside and out. The street railway fare is 10 cents, six tickets for 50 cents

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or $1.50 for a weekly pass. The company also has a modern 29-passenger bus giving service between Youngstown and Struthers. The bus has the same type of seats, the same character of lights and the same general interior finish as the street cars on this line. As happens from the very nature of the bus, it is not as roomy as the street car; passengers are more crowded and while it rides well for a bus, it certainly does not ride as smoothly as the modern street cars. The bus makes the trip in slightly less time. The fare is 10 cents without transfer or ticket reduction. This differential in fare on the 4-mile trip produces the result that there is scarcely any riding on the bus. The number of passengers carried per day on the bus line is 105.4. The number of passengers carried per day on the car line is 3,000. Of course, this bus does not pay expenses. It is kept in service because the street car line crosses the Mahoning River on a bridge which some people claim is too light for such traffic and for this reason a certificate was given to a bus line some years ago, which certificate has since been acquired by this company.

Such an instance as this does not, in itself, condemn the whole theory of bus attractiveness, but it is the accumulation of such testimony as this that gives a definite indication that while there may be differences, and are differences, in service given by buses and by street cars in various places, there is no single fact connected with bus transportation that makes it inherently more attractive as a transportation medium than the street car and that it possesses no quality which can not be possessed in equal measure by the street car.

If the above argument is correct, the selection of the field for these two vehicles immediately is narrowed down to a merely economic consideration. The question then leaves the field of conjecture and is to be measured and decided by considerations on which, at this time, there ought not to be any real difference of opinion.

To afford anything like an equivalent basis of comparison, it must be assumed that the street car in every case is one-man operated. Transportation vehicle expenses are classified usually as direct operating expenses, depreciation, interest on investment and taxes. The direct operating expenses consist of maintenance of way and structures, maintenance of equipment, power, transportation and traffic, and general and miscellaneous. To make a proper rule for comparison, I will devise a classification that does not exist but which can easily be built up, as follows:

A

Maintenance of equipment.
Power.
Transportation and traffic.
Interest on investment, equipment.
General and miscellaneous.
Depreciation, equipment.
Taxes other than tax on way and structures.

B

Maintenance of way and structures.
Interest on investment, way and structures.
Depreciation, way and structures.
Taxes, way and structures.

It will be seen that I have inserted in group A all of the expenses that are common to street cars and buses and in group B all expenses that are inherent in street cars alone. Examining the former, I believe it will be the testimony of all street railway managers who have had any length of experience with both buses and street cars, that the cost per mile of any bus large enough to be a factor in urban traffic, properly operated and maintained, is greater than the corresponding cost per street car mile.

Typical interurban coach of the system, used for limited service between Cleveland and Youngstown

Manifestly, with one-man vehicles, transportation expense, as represented by wages of operators, will be the same. The inspection expense of buses will be greater. The expense of maintenance of equipment will be greater in the bus than in the street car. The expense of power, as represented by gasoline when compared with electric power, will be approximately equal. Where there is a gas tax, the expense of tax on equipment will be greater. There is no reason for any difference in the general and miscellaneous item.

However, offsetting this fact, we have in the second group an expense that is not shared at all by buses. Before considering the effect of these expense items upon our transportation, we must take into consideration the further facts that the conventional, normal bus for which we have years of performance figures, seats only 29 passengers and that the normal, conventional one-man car

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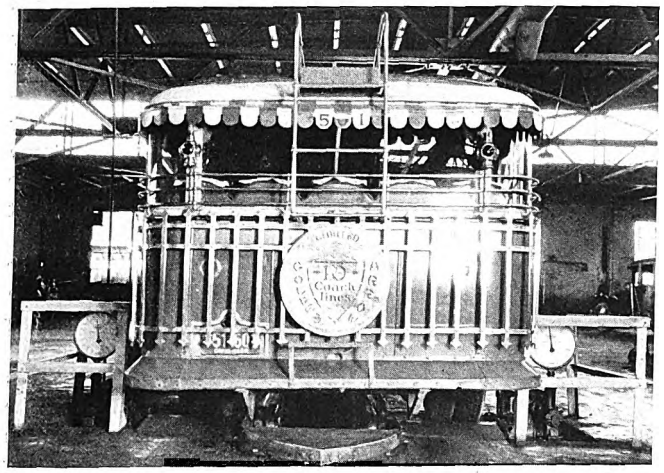


Rear of one of the interurban coaches having brakes tested before starting on a trip

seats 44 passengers; that the loaded capacity of the bus is never in excess of 50 passengers and that in any condition of peak-hour traffic, the street car can handle 100 passengers.

The elements of this acrostic may now be set together. The group A costs of the bus are greater than the group A costs of the street car; the group B costs of the street car are not dependent upon the number of cars upon a line but are fixed at the time the line is built, the only variation being the very small variation produced in the item maintenance of way and structures. Therefore, every additional car-mile on any given line decreases the unit cost of the group B expense per mile. It is manifest, therefore, that the group A expense being heavier in the case of the bus than for the street car, on existing transportation routes with headways of two minutes to five minutes, or in some cases even ten minutes, the group B expense per mile becomes so small as not to equal the differential in group A expense between the bus and street car.

A decade ago in the average city there were street railway routes 1½ or 2 miles in length that supported fairly frequent headways. Every such route should be given the closest scrutiny when need for rebuilding arises, as in a great many cases it will be found that present headways on such short lines, due to the use of the automobile, are fixed not by traffic demands but by minimum headways felt necessary to preserve any sort of riding. On these lines with, say, twenty-minute headways, the number of car-miles will be so small that the group B expense will be high enough to make the bus the more economical unit.

In many cases it will be found that even with headways as short as ten minutes it would be advisable not to rebuild the lines but to use buses. Particularly is this true if the line is single track, with passing sidings contributing to low schedule speed, or if any obstacles exist on the street car line that can be avoided by a bus line serving the same general territory.

Again, existing street car lines between 2 and 3 miles in length, in which conditions do not warrant extensions, are debatable ground when need for rebuilding arises. When a demand for a new line exists, which must be fulfilled, in almost every case short of this 3-mile limit it will be found that the present bus is the more economical vehicle.

A careful analysis of present street car records will indicate that in almost every case where a line is more than 3 miles in length and the standard Birney car is being used, the line is unprofitable. If the headway of the Birney cars is fixed by traffic demands at an interval of less than ten minutes, the line will be rendered more profitable by the substitution of larger equipment at a longer interval. If the headway on the line is fixed, not by traffic demands, but at an interval of ten minutes or greater, the same being considered the minimum interval to attract traffic, in all probability the substitution of larger equipment at very long spaces would produce a reduction in riding.

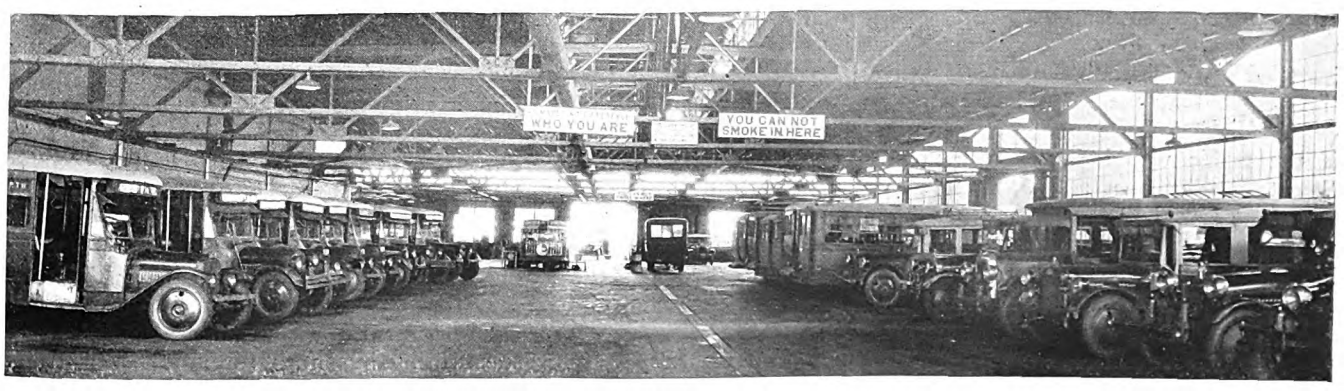
Therefore, for lines of more than 3 miles, where operation can be rendered profitable by the substitution of larger equipment, the bus cannot be a substitute for the street car under present conditions. If the line, however, shows best results with Birney cars at long intervals, then, while the line is unprofitable, no more unfavorable results would be shown by the use of buses.

These theoretical calculations have been demonstrated thoroughly in Youngstown. In the accompanying table are given the results for the year 1927 on four typical bus lines, with length of line, headway and earnings per bus-mile.

Headway, Length of Line and Earnings for 1927 of Four Bus Lines

	Headway Minutes	Length of Line Miles	Earnings (Cents) per Bus-Mile
Hillman Street	9	2.05	33.17
North Avenue	8	2.25	31.47
South Avenue	10	3.40	26.62
Indianola Avenue	10	3.60	25.83

Repeated checks have shown that the traffic density on buses, the proportion of seats occupied by passengers, are practically the same on all four lines. The long lines, South Avenue and Indianola Avenue, pay operating



Interior of the Penn-Ohio System garage in Youngstown

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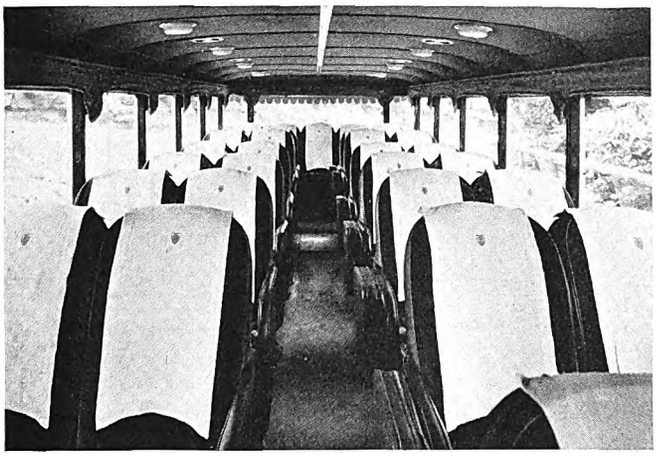
expenses but do not earn depreciation and interest. The short lines are profitable. The two short lines, manifestly, are more profitable than street railway lines would be under the same circumstances. As a matter of fact, the North Avenue bus line was substituted for a street railway line covering almost exactly the same route. If the two long lines were street railway lines, practically the same service as given at present by buses would be given with Birney cars on ten-minute intervals. The riding probably would not suffer with larger cars on fifteen-minute intervals. However, with such low car mileage, the cost of group B expense per car-mile would be so great as to prevent a profit.

Penetrating the same general section of the city as these two long bus lines is the Park and Falls car line with a length of 3.8 miles, a headway of five minutes and with cars seating 60 people. This car line returns 44 cents per mile. It requires no deftness of calculation to show that with the standard city bus the substitution of bus service for this car line would be extreme folly.

In Youngstown, therefore, and this probably would be typical of the average American city, the field for the bus is the short line less than 3 miles in length under



Coach interior showing emblem of the Penn-Ohio Coach Lines on the seat covers. Note also the folding seats in the aisles

almost any condition and the line longer than 3 miles whose present or prospective traffic does not warrant headways shorter than ten minutes with small units. Aside from these two fields, we have found no use for the bus in city service. However, within its field the bus is certainly a tremendous asset and advantage to the entire system. Particularly has it been of advantage in trying out new routings. Four lines have been operated for varying periods at the request of citizens in widely separated localities. Each of these lines has been installed in good faith with widely advertised notice to the people that the service was being rendered for a definite period for experimental purposes to determine if the traffic would pay. In the case of the Emma Street, Bond Street and Salt Springs Road lines, the attempt showed conclusively that the available traffic, which the citizens sincerely thought would support the bus line, did not exist. The fact that the company made the attempt satisfied these citizens. In the case of the Rayen bus line, it was found that the traffic would support one bus on a 30-minute headway and this bus has been continued.

The development of the single-deck bus with a seating capacity of 40 people and standing capacity comparable to that of the street car would require an entirely new set of calculations and a complete revision of the field for the bus if the larger vehicle did not also require a complete change in the element of cost. Experiment has been made with this larger type vehicle in Youngstown but the experiment has not been prolonged sufficiently to enable us to form an opinion as to what the ultimate cost and success of the vehicle would be.

In the present state of transportation, I believe the standard bus is the conventional, single-deck bus with a seating capacity of 29 passengers. If the vehicle seating 40 passengers can be successful at not too great a differential in cost it will simply serve to lengthen by a comparatively moderate distance the field in which the bus is the preferable vehicle. It must not be forgotten that one-man street cars are not limited to a seating capacity of 40 or 44; that the vehicle with this moderate seating capacity is used simply because the moderate seating capacity takes care of a reasonable headway. There is no limitation, however, on a one-man car seating 60 or 70 passengers, so that while the size of the bus to be operated at moderate cost may be increased, there is still a long way to go before it can meet the street car on its own ground.

A great deal of attention has been attracted by bus lines supplementing street railway service at higher rates of fare. The higher rate of fare, of course, enlarges the radius of the profitable field of the bus. In viewing such experiments let us not lose sight of the fact that the customers for public transportation in any given built-up area have greatly decreased and not increased within recent years. Is it not a desperate measure then to provide duplicate service to a reduced market?

In the long run should not the effort be made to remove the obstacles to street car service that render it inferior to the duplicate bus service? Where there is a chance to remove such obstacles and actually to make a profit from the express bus service, of course there is no reason why the transportation company should not run such service, but the very fact that there is demand for such service should inevitably focus determined effort to build up the quality of the street car service rather than to take the patronage away from it and so reduce its value.

Due to the somewhat hysterical effort on the part of many communities to force the use of buses there have been instances where companies running interurban lines within city limits have been induced to abandon city cars and substitute buses. It appears to me that in almost every case this has been an uneconomic procedure. The group B expenses have not been eliminated and the bus, with its higher group A expenses, will produce less profit than would the continued use of street cars on such a line under any conditions that would be likely to obtain.

With the bus as it exists at present, our path in Youngstown is extremely well charted. Of our nine existing car lines, three short ones will not be rebuilt but will be substituted by buses. On the other hand, as the territory served by our long bus lines builds up, unless the ratio of street car riders to the total population should continue to decrease, in all probability they will be succeeded by rail lines. Unless there is a radical and unlooked-for development in the bus, there is no apparent reason for substituting bus lines for any of our trunk street railway lines and these lines are being rebuilt as such necessity arises.

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The Power Department Plays an Important Part in

Selling Rides

BY

L. D. BALE

Superintendent of Power Cleveland Railway, Cleveland, Ohio

An example of an artistic automatic substation building and surroundings which would constitute an asset to almost any neighborhood

DURING the past few years there has been put forth a tremendous effort on the part of many electric railways to win back lost patronage. These efforts have evidenced themselves in most instances in the form of campaigns whereby, through the medium of advertising, the public has been informed principally of the economies and personal safety factor to be gained by riding the vehicles of an electric railway system.

Aside from, and in some cases in addition to, such advertising, certain properties have really attempted to make their facilities and service more attractive and more pleasant to use. The rolling stock division has designed new cars, and in some cases successfully revamped older types of equipment, giving consideration to appearance, comfort, riding qualities and noise reduction. The way department has been paying more and more attention to the maintenance of rail joints and roadbeds, and the transportation department, besides keeping the cars more sightly regarding cleanliness, has been training crews in courtesy and insisting upon neatness of appearance. In addition to involving the departments mentioned in this process of selling the company's service, new departments have been in some instances created where the relations between the company and the riding public are being carefully guided in an attempt to enhance the company's position by the creation of friendliness with its patrons.

IN THE CAMPAIGN of "Selling Better Transportation Better," the power engineer can contribute inestimably by realizing his responsibility to the public, furnishing a continuous power supply, encouraging intradepartmental and interdepartmental co-operation and reducing power costs to a minimum

The nature of these campaigns, their scope, the extent

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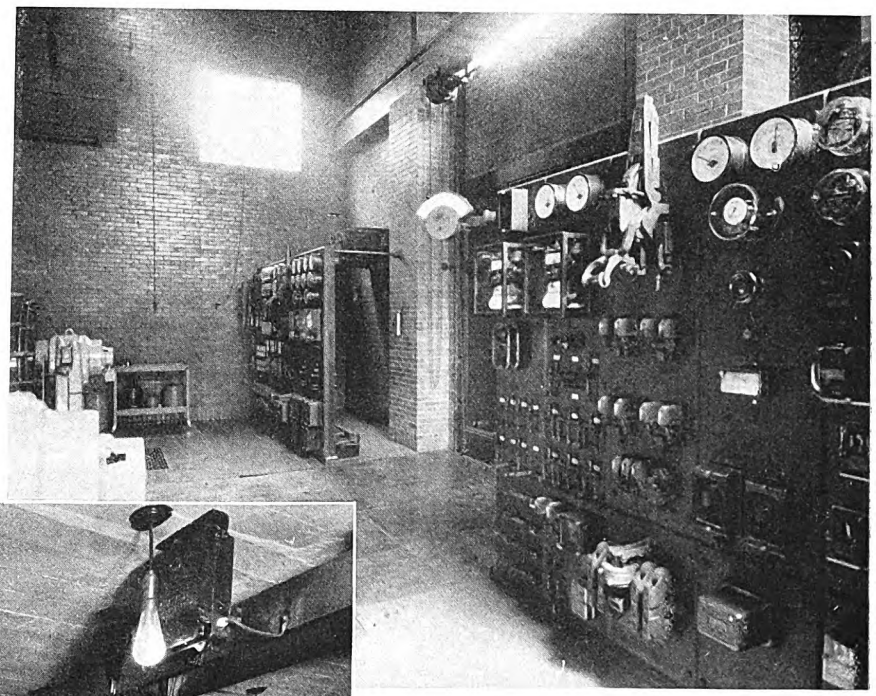
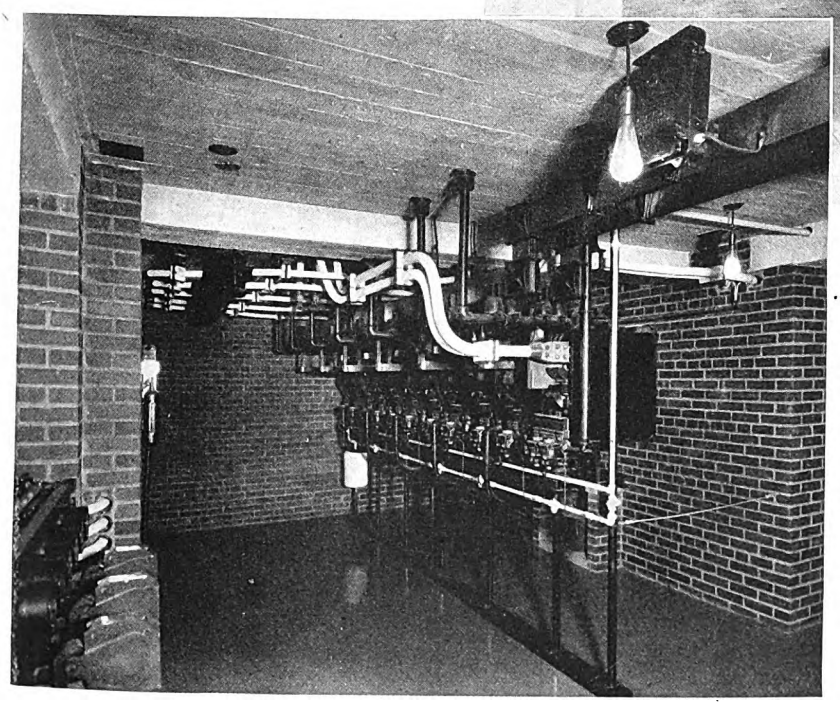
At left—Pole construction designed for joint use of two or more utilities so as to eliminate duplication of facilities and the necessity of undue cluttering up of thoroughfares.

At right—Better and more economical power service may be rendered by the use of automatically controlled equipment.

Below—The flexibility during emergencies is best secured through the use of auxiliary buses and d.c. feeder contactors, in addition to the main buses, in each of the power centers.





ingly symmetrical trolley poles and overhead construction not cluttered up with unsightly appurtenances, and considerate treatment of the public and their private property by maintenance and construction gangs, to the specific business and ultimate purpose of hauling street cars. It is a contribution which calls for a touch of the esthetic and involves a sense of moral obligation to the public in its indirect phases of activity, and one that demands, in its specific field, the essential economic factors of reliability of service, complete co-operation and low cost.

However, the power engineer's sense of exclusiveness and his attitude of narrowly circumscribed responsibility, though they may sometimes represent inherent characteristics, are in many instances the result of an extenuating circumstance—an over-economically minded management, be it so minded from choice or necessity.

The continual hammering for "more efficiency" and the never-ending cry of "cut the power costs" have tended to make of the engineer a paranoiac, and have distracted his attention and energy, as well as that of the economy-driving management, from the larger and more important job of helping to establish and maintain the general health of the transportation business, even though this goal involves the sacrifice of certain "pet" power economies. So much stress has been laid upon the possibility of saving a ten-thousandth of a cent in the production of a kilowatt-hour that the power engineer has become blinded to the probability of contingently losing $10,000 in the fare box.

This assertion, as to the minor rôle that power cost plays, may be the better appreciated when it is remembered that the total investment in the power producing, conversion and distribution facilities represents generally but 10 per cent of the total investment of the electric railway's entire property, with maintenance and operating costs running in about the same proportion, and that the fluctuations in these costs effected by the utilization of all possible operating economies are comparatively trivial. On the other hand, interruptions in service have the immediate effect of a 100 per cent loss to the company's treasury and the pocketbook of the passengers, and the far-reaching, psychological effect of creating in the minds of the car-riding public a distrust in car schedules and a weakening of faith in the ability of the management.

Generally speaking, a system which is well designed, constructed and maintained is also, in the final analysis, most economical to operate. And with such objectives in view, the progressive power engineer, through study and experiment, has already acquainted himself with the various phases of the economies to be derived from high load factors, elimination of feeder and return circuit losses, utilization of car meters, proper training of employees, etc.

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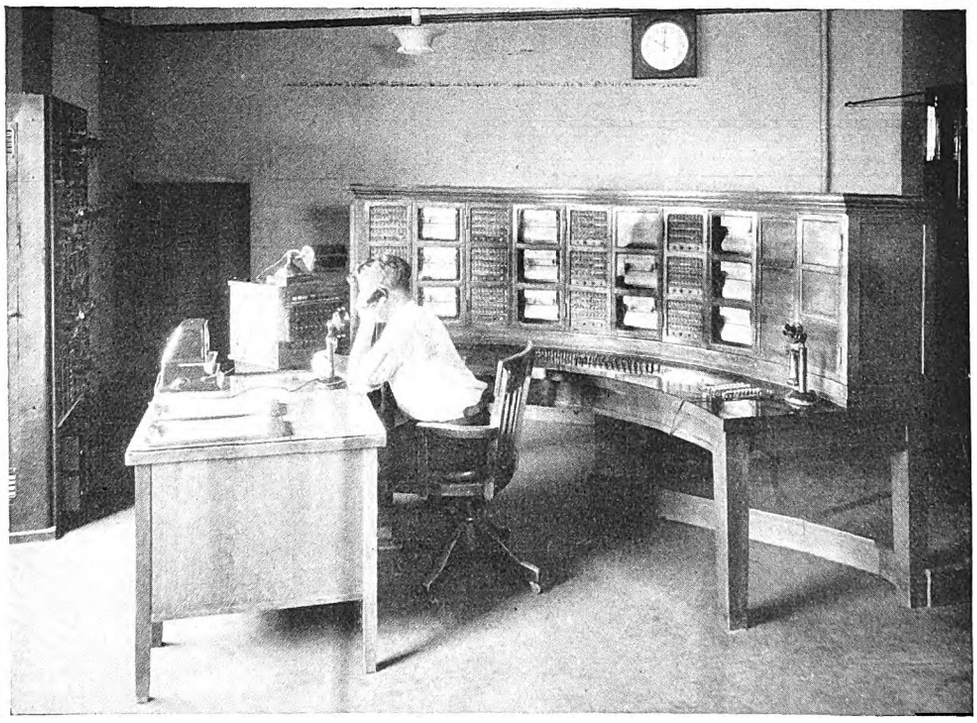
But, there are other important items, however, that until comparatively recent years were not given consideration. One of the most pertinent of these, which affects the entire system, and a subject that, in so far as it pertains to congested areas, is at present being studied by the engineering committee of the A.E.R.E.A., is the question of proper voltage. There is, without question, a very distinct saving to be made by lowering the voltage in the downtown or congested areas, and similarly there are direct advantages obtainable by raising the potential in non-congested or free-running areas. The former expedient, of course, results in a saving of power, and the latter in reduction of transportation equipment and platform wages by requiring less cars and less trainmen to supply a given service.

This is but one example of a true economy that may be effected safely by a street railway power system. It represents a possibility for real saving and is in direct contrast to the many artificial economies that have been from time to time introduced which, while resulting in an apparent decrease of expenses, have in reality weakened the whole power producing and distributing structure.



The guiding hand of a trained dispatcher located at a supervisory desk is of immense value in the consummation of power production efficiency and continuity of power supply, a feature which cannot be secured in any other manner

Without doubt, there are many cases of just such harmful retrenchment, or of hazardous procedure, where it would be entirely reasonable and justifiable to increase, even materially, the total annual cost of producing and distributing a particular power requirement, as, for instance, where dangerous overloading or obsolescence exists, or where inadequate provision has been made for emergencies, or where the standard of maintenance is held on far too narrow a margin of safety. In other words, the cost of power is cheapest when it best subserves the interest of the utility as a whole, regardless of the ostentation of a specious departmental economy.

It may be stated unequivocally that the two outstanding factors entering into the strictly commercial side of the power end of electric railway operation are cost and reliability, and of the two the latter is of far greater importance and of more vital interest to the man who utilizes such transportation in his daily business and social life.

"All dressed up and no place to go" may represent an unfortunate predicament for a would-be traveler, but a trolley car "all filled up and no power to go" means a still more unpleasant situation for the car-rider and a serious business indeed for the electric railway company which happens to be in the unenviable position of having a car or car line "go dead" on its hands.

Similarly, from the standpoint of the power department of the public utility itself, the dependability of service is its strongest talking point in the selling, or "better selling," of "better transportation" to the man who uses it or to the prospective customer who may be induced to use it.

One of the prime essentials of such reliability of power supply—in fact, the connecting link between this and the item of cost—is an efficient departmental personnel. And this means not only individual training and experience of each employee but also smooth functioning of all integral units of the power department, including the operating, maintenance and construction divisions. Further, it is imperative that there be full and complete co-operation, not only among all these subdivisions but also between the department as a whole and all other co-ordinated parts of the system. Such co-operation, working together for the common good, will go far toward minimizing schedule interruptions, insuring rapid restoration of service in the event of breakdown, and through the medium of general cumulative experience and diagnostic forums do much to anticipate future exigencies and preclude their frequency and gravity of recurrence.

In a word, each man should feel keenly his responsibility to his immediate superior, to the organization as a whole and to the public at large, to perform his especial duty conscientiously, intelligently and with a strong feeling of pride in the growing prestige and efficiency of his particular utility.

Proper Facilities Guarantee Reliability

Getting away altogether from the human side to the material side, it is an axiomatic statement that reliability or continuity of service is the outcome of foresight in providing proper facilities for the production, conversion and distribution of power supply, both for normal conditions and for all possible contingencies that may develop. And among the more important guarantees of this factor of reliability may be mentioned:

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1. Dependable source of generated or purchased primary energy, with sufficient reserve equipment or interconnections of generating plants with emergency sources of outside power.

2. Duplicate alternating-current feed to substations.

3. Adequate reserve equipment in conversion plants, or, preferably, arrangements to utilize reserve of system in event of emergencies.

4. Interconnection, under control, of low-tension side of conversion plants to enable shifting of load through distribution system for whatever exigencies may arise.

5. Frequent sectionalization of direct-current distribution system under control.

6. Arrangement of distribution system and contact system so that power may be supplied from more than one source.

7. Selection of conversion and control equipment with special reference to rendering satisfactory service under adverse conditions of power supply and load.

8. Utilization of automatically controlled plants, with proper spacing of same and arrangement of distribution system and control to insure continued operation of system in the event of loss of a complete plant. This substitution of the automatic for the manual substation minimizes the ever-present complication of the personal element, and obviates delays in service from slow and tedious manipulation of manual equipment and complete stoppage of service from strikes and labor troubles.

9. Utilization of supervisory control superimposed upon automatic control.

10. Maintenance of power production, conversion and distribution equipment, including that of the contact system, at the highest possible standard.

11. Maintenance of capable and efficient trouble or emergency crews to rectify expeditiously all unforeseen difficulties, failures and breakdowns at a moment's notice.

Cost of Improved Facilities More Than Warranted

To provide these various protections to continuity of service means, of course, an outlay of capital in many instances, and it is questioned in some quarters whether such investment for the precautions and refinements necessary to guarantee a continuous supply of motive power is justified for the street railway. In answer to this, one has but to review the history of other common carriers and industries, some of which have been subjected to as great a pressure as has been the street railway business during the past few years. Those organizations which are alive today and prospering have fully realized that to remain in business it was necessary not only to avail themselves of every economy practicable, but—of greater importance—so to arrange and improve their facilities as to offer a service or commodity better than that previously offered and equaling or even surpassing that of competitors.

The progressive street railways also are realizing this situation and have come to the conclusion that the erstwhile car rider, and the present intermittent user of the electric railway, having discovered greater comfort in his own private motor car with the certainty of a seat, a soft cushion and resilient springs, a faster schedule, and with equal and often greater dependability of service. (but at three times the cost), can only be weaned away from his new and more expensive means of locomotion by the attraction of similar traveling ease, speed and reliability at a fraction of the outlay.

To sum up this situation as it pertains particularly to the power department of the average street railway, there are four distinct duties which fall directly within the province of the head of that department—four phases of his activities which will contribute to the general rehabilitation of the company's property and its economic virility. Enumerating them in the order of their respective importance they are: First, realization of his responsibility to the public at large as well as to the company itself; second, continuity of power supply, even during emergencies; third, intradepartmental and interdepartmental co-operation; fourth, reduction of power costs to the lowest possible point consistent with proper maintenance of facilities and necessary safeguarding of equipment and service.

An interested and appreciative crowd more than filled this automatic substation when it was opened to the public for inspection

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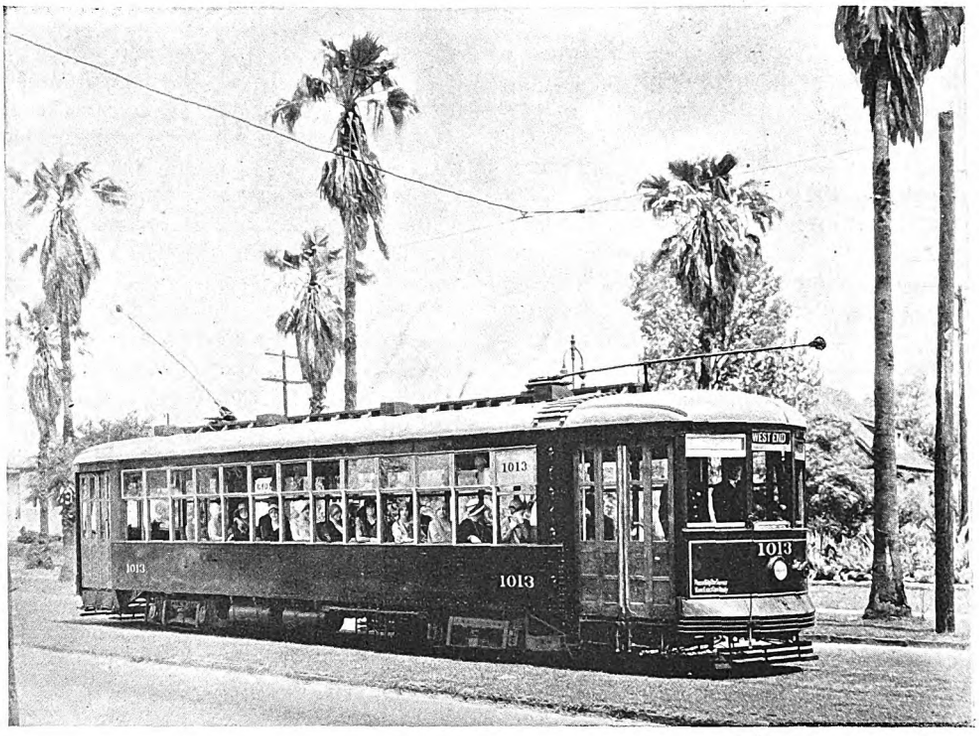

Smooth track is a big aid in making rides more salable, for the public of today is demanding riding comfort approaching that of the automobile

LOOK TO YOUR TRACK

It is the Foundation of Your Business

BY

A. B. PATERSON

Vice-President New Orleans Public Service, Inc., New Orleans, La.

FOREMOST of the worries that beset the electric railway executive today are those which have their roots in the very human craving for complete individual freedom of movement. America is a nation of individuals—not of masses; its entire economic structure is individualistic, and there is a universal striving for the attainment of individual freedom of action in all the ordinary affairs of life. Coupled with this is the high degree of individual economic independence which is the outgrowth of American resources and prosperity, yielding to the individual the means with which to gratify his reasonable desires. And so in this country, to a far greater extent than in any other part of the world, the individual has seized on the automobile as the almost complete fulfillment of his transportation needs and desires.

That the desire for individual transportation is very deeply rooted in human nature is attested by the almost incredible rapidity with which the number of automobiles has grown, and the tenacity with which people will cling to their cars even in times of adversity. We are deluding ourselves if we overlook the fact that the attractiveness of individual transportation is the principal reason so many people ride in automobiles. However, counteracting this powerful force are several drawbacks that are responsible for many users of public transportation vehicles not using private automobiles. Among these are the lack of ownership of an automobile, inability to obtain the use of the family car, economic limitations on the regular use of an auto, fear of driving in heavy traffic, disinclination to face the difficulty of finding a place to park, low speed of the automobile in dense traffic, or some other limitations in the

PROPERLY-CONSTRUCTED track gives the street car patron a smooth and quiet ride and that is what he has been educated to demand. Because of this demand the way engineer has a very definite part in selling transportation

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automobile itself. But, in spite of all these drawbacks the individual car remains the standard of comparison in the minds of the average person.

Admitting this truth, we must bestir ourselves to hold our patronage by giving to our passengers the closet approximation that we can to the comfort they enjoy in "riding on rubber." If we don't, we may expect to see them drifting away in greater numbers all the time. Although we have perfected our schedules and have made our cars approach as closely as possible the comfort of the automobile, there still remains the track. Now the driver of an automobile is not confined to a fixed route as a street car is, but can and does choose his route to give the maximum degree of riding comfort. Even the regular patrons of the street cars ride frequently in the automobiles of other people, and they are just as well aware of the independence of motion of the automobile as the motorist is, and are also aware of the fact that almost all the time they are riding in an automobile they are rolling along smoothly and silently.

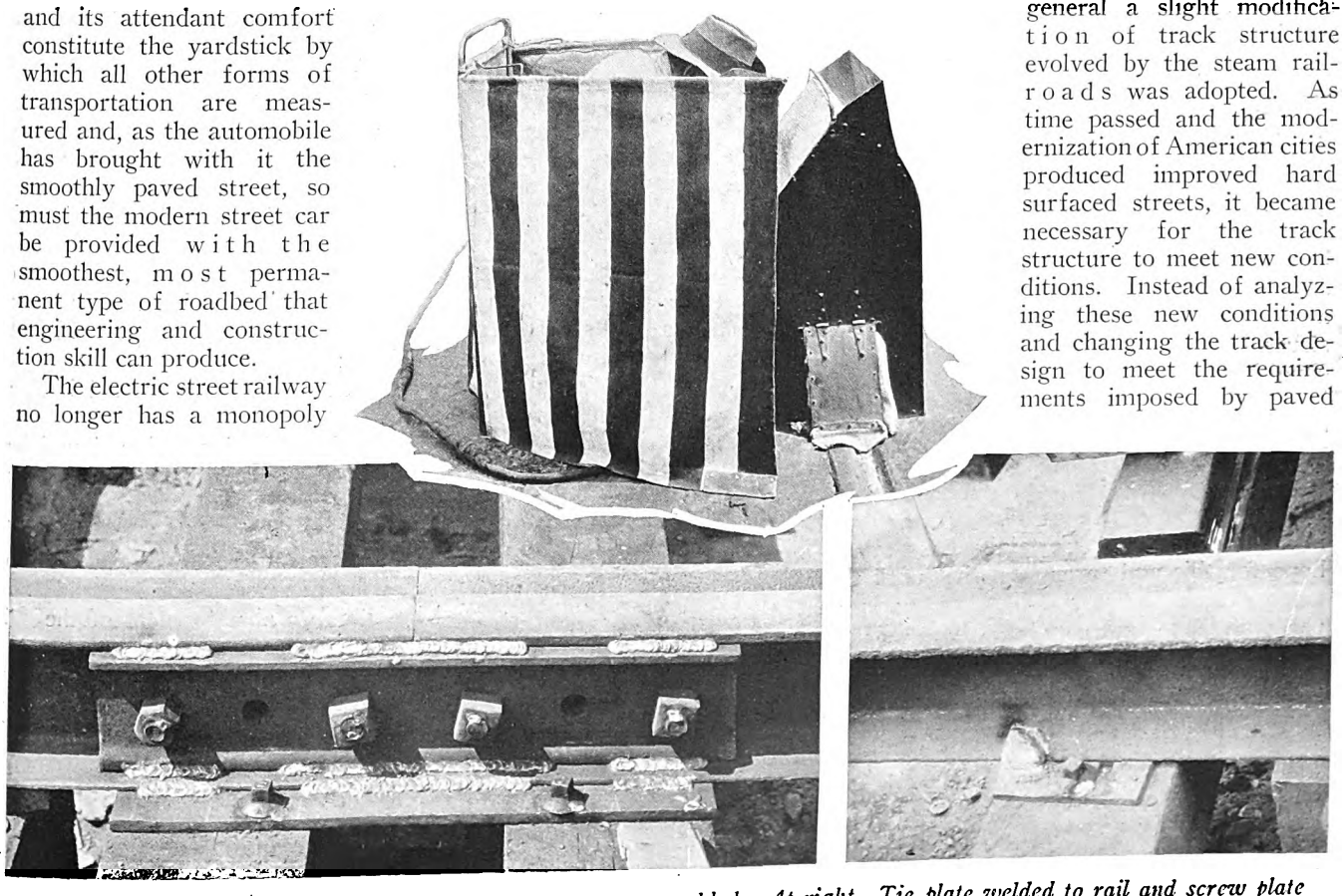
And that is just what everyone wants today—to roll along smoothly and silently, whether in an automobile, a bus or a street car. The automobile has created this desire, and if the street car can't give it, then the street car must suffer. Gone are the days when people were content to bump along in rattling, clanking, dilapidated old street cars, and likewise, gone are the days when they would tolerate uneven track, rough joints, poorly constructed switches that caused frequent derailments, or any of the other defects of cheaply constructed or poorly maintained track. These things prevent a street car ride from approximating the comfort and quiet of an automobile ride, and the riding public simply will not stand for them. The automobile and its attendant comfort constitute the yardstick by which all other forms of transportation are measured and, as the automobile has brought with it the smoothly paved street, so must the modern street car be provided with the smoothest, most permanent type of roadbed that engineering and construction skill can produce.

The electric street railway no longer has a monopoly of urban transportation, but, on the contrary, is faced with competition of the severest and most persistent kind. Therefore, like any other merchant in a competitive business, it must make its wares as attractive as possible. Of all the wares that the street railway merchant has to offer to his patrons, none is more closely examined than the track. Every passenger is aware of the existence of inferior track, and it brings into his mind at once the superior qualities of automobiles and paved streets. And so, from the strictly merchandising point of view, it seems clear that to make possible the successful selling of our transportation service we must look to our track, for it is, literally, the foundation of our business.

There is a second very important reason why we should give the closest attention to our track, its design, construction and maintenance. It is entirely true that we must do a first-class selling job if we are to thrive as purveyors of urban transportation, but it is equally true that after we have induced people to ride we must conserve the revenues which they pay us, so our properties may earn a fair return on the invested capital. This does not mean penny-pinching or starvation of maintenance, but it does mean design, construction and maintenance methods based upon a thorough understanding that the cheapest track is that which has the lowest total annual cost throughout its life. While this fact seems almost self-evident, it is true that only in recent years have street railway operators become fully conscious of it—and some have not realized it even at this late date.

When electric railway tracks first came into general use practically all of the track was constructed in unimproved streets. In general a slight modification of track structure evolved by the steam railroads was adopted. As time passed and the modernization of American cities produced improved hard surfaced streets, it became necessary for the track structure to meet new conditions. Instead of analyzing these new conditions and changing the track design to meet the requirements imposed by paved

Welding can be done without harming the eyes of pedestrians if a glare shield similar to this one is used



At left—This joint is built for permanence. All parts are welded. At right—Tie plate welded to rail and screw plate welded to plate, giving a rigid track structure

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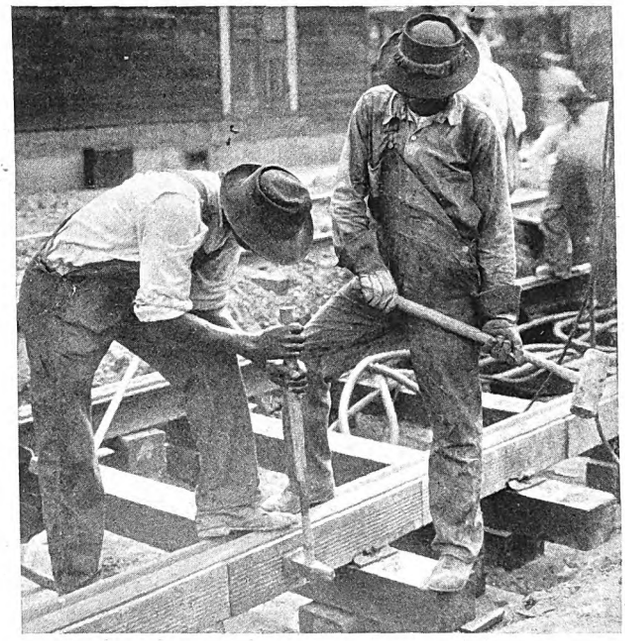
streets, a general policy was followed of molding the paved street about the then existing track structure. The results almost universally have proved unsatisfactory and an excessive burden of maintenance cost has been thrown on both the track structure and the surrounding pavement. It is proverbial that hindsight is better than foresight, and our superior hindsight now enables us to see that a clearer understanding would have led to a consideration of the engineering fundamentals introduced by the paved street, and that this would have led in turn to redesign of the track structure to fit into these imposed conditions. Progress toward the modern type of co-ordinated track and paving structure has been painful, expensive and slow—and has not reached its final objective yet. There has not been developed as yet a recognized standard of track construction that meets the requirements of the ideal track, namely, maximum life with minimum maintenance cost. Most of the present-day tracks have been constructed so that component parts of the structure can be renewed without disturbing the remainder. This method should be contrasted with that of using materials so designed and so proportioned that all parts would have a uniform life.



Plastic rail filler helps prevent transmission of vibration between rail and pavement

The design of a railway track in a paved street is an engineering problem involving fundamentals that can be likened to the problem of building any form of foundation or structure. There is little indication, however, that the problem of track design has been given this type of attention. The industry has been content to accept the multitude of empirical ideas and more or less intelligent guesses that have evolved our present standards of construction. The result is that we see a great variety of so-called types or standards of construction, each justified and predicated upon certain local conditions. Now, experience has indicated quite definitely that the component materials utilized in track construction have a useful life of at least twenty years. Why then, is it not entirely logical to design and install these component parts to produce a track in paved street that will give a life of twenty years with no major maintenance at all? Certainly it is not unreasonable to hope for this and to suggest that until the standard of track design for any given locality is such that the parts do have uniform life, those responsible for the design have not made the proper uses of the engineering materials and knowledge available.

However, we still have to live with tracks of every vintage and type, and we must continue to maintain them. Because of consolidations, an absence of recognized standards of construction and other causes, the average operating company has acquired several different designs of track through its period of development. When the total maintenance cost is spread over the net mileage of such a varied track system it is impossible to determine the relationship between track design and the resulting maintenance costs. A general survey of track maintenance cost records and the lack of attention given to such records by operating executives leaves one with the impression that such expenditures have been accepted as an inescapable and irreducible necessity, and also suggests a further thought that a systematic, adaptable and usable cost record might well lead to a worthwhile reduction in operating expenditures.

That records do assist in lowering costs has been demonstrated by the roadway department in New Orleans, which has developed a system of track maintenance records that affords a means of sound and economical analysis of operating costs. The maximum value of these records and of the analyses made from them comes from the accumulation of cost data over a period of years. Results have shown that the effect upon the supervising personnel of seeing just where the money goes, and of the interest and enthusiasm that can be created by analyzing and following up the budget performance, are productive of efficiency. In passing, it is suggested that roadway executives, who will adopt the "foremen conference" plan in dealing with and interpreting the records of maintenance cost, will be amazed at the resulting increase in efficiency and reduction in costs. Excessive expenditures upon any length of track can be noted immediately and the value of each type of track design determined from the maintenance records.

Coincident with the need of detailed analysis of maintenance costs there exists the necessity of a system of maintenance procedure and methods that will fit in efficiently with the results of this analysis. A few basic factors, essential of observance in developing an efficient system, are appended here:

1. Troubles should be detected and corrected before potential failures occur.
2. The information furnished by inspection should be used as a basis for planning a schedule of maintenance work outlined to employ the minimum of forces.
3. A definite follow-up system should be instituted of checking the method of performing the work in relation to the cost, to develop the most economical methods.
4. There should be complete abandonment of the old "section gang" methods of track maintenance.
5. The opportunity to foster and maintain good public relations should never be lost sight of. Details like the protection of the eyes of passers-by from the glare of electric welders and the facilitation of traffic movement by the installation of temporary crossways when streets have to be opened, should never be neglected.

Certainly from the standpoint of selling our service, and equally from the standpoint of ultimate economy, we must look to our track—for it is the foundation of our business.

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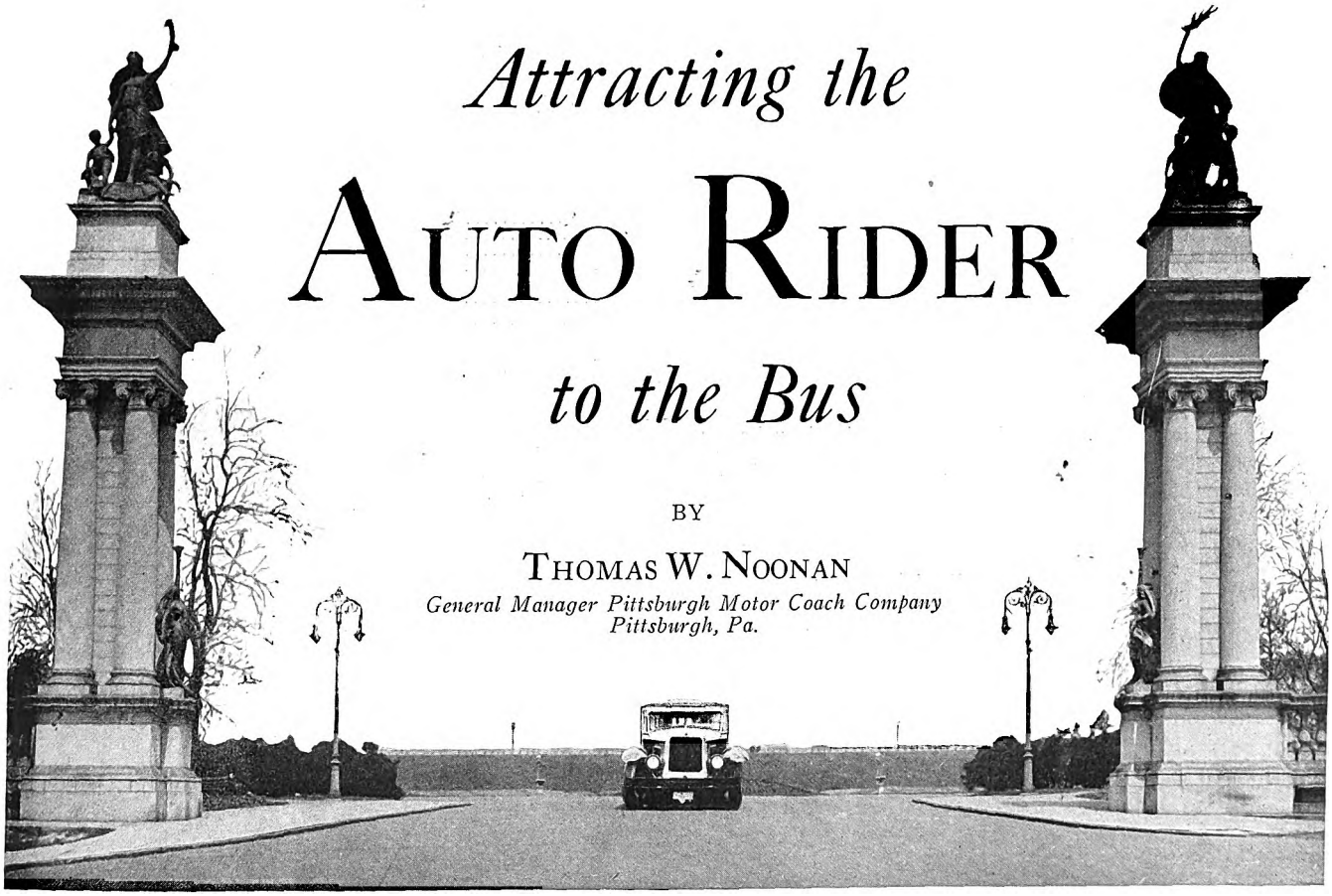
Attracting the AUTO RIDER *to the Bus*

BY

THOMAS W. NOONAN

General Manager Pittsburgh Motor Coach Company
Pittsburgh, Pa.



Five de luxe bus routes of the Pittsburgh Motor Coach Company serve a large number of persons in the suburban residential sections of the city

DE LUXE coach service at higher fares has opened up a new field of merchandising endeavor. It is offering an exclusive ride to a class of patrons accustomed to using private automobiles and it is to this class, living in the suburban residential sections, that the sales effort must be directed. That this type of service does appeal to the automobile user and can readily be sold to him is proven by the experience of the Pittsburgh Motor Coach Company over a period of three years.

The company entered the bus field by purchasing an independent line 5 miles in length between downtown Pittsburgh and the East Liberty district, the equipment involved in the purchase consisting of six double-deck and five 12-passenger buses. Two routes were established, the East Liberty and Squirrel Hill routes, the second being 5.7 miles in length. These two have since been supplemented with three additional routes, so that at present the company has 32.2 miles of one-way route. The fare on each route is 25 cents cash or nine tickets for $2. Previous to the introduction of the rate of nine tickets for $2, books of 21 for $5 were tried, but tickets collected after nine months trial represented only 2½ per cent of the total fares and their use was discontinued.

The ticket rate was established to encourage the use of coaches and to eliminate the delays accompanying change making. The increased use of the reduced rate ticket will, we believe, accomplish the purpose intended, for figures available after two weeks' use show an increase in off-peak riding and a gradual increase in the number of ticket users.

The scheduled route service is of the type that releases about 50 per cent of our coaches on Sundays for other special services, and to keep them in use a coach representative is employed to solicit private parties for Sundays as well as for evenings and mid-days. The chartered service has proved quite profitable. For the first six months of 1928, 395 special coaches were handled with a revenue of $13,767, as compared with 286 specials and revenue of $7,281 for the same six months of 1927.

During the early part of the summer of 1928 three special Sunday-holiday routes were established. Two of these connect downtown Pittsburgh with the newly established parks of the county, one route being 11 miles long and the other 14 miles long. The fare charged on these is 50 cents each way. The third route is a special scheduled service between Pittsburgh and the Willows Swimming Pool, a distance of 12 miles. On this route a combination ticket, good for transportation on the coaches and admission to the pool, is sold for $1.50. This route has proved profitable from the very first day.

In addition to the three park routes and private party services, the company also conducts the Gray Line sightseeing service in Pittsburgh. Because of these special services during the summer season the company is able to maintain a profitable operation during June, July, and August, when the regular traffic shows a decline. Our regular traffic, having been developed principally for the convenience of the auto rider, shows a falling off on account of the vacation period, theater closing and more general use of the private automobile during the summer months.

The original service was established with 29-passenger coaches on long headways, both during the peak and

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Service, similar to that offered in Pittsburgh, is given by the Toronto Transportation Commission on a 4½-mile route, joining two residential districts with the heart of the city

off-peak periods. However, we soon realized that if we were to win the private automobile driver our headways must be closer. With this in mind our first experiment was made on what was then known as the Point Breeze route, now called Wilkinsburg.

This route has been on a fifteen-minute peak headway, a twenty-minute base headway and a thirty-minute evening headway, with 29-passenger street car type coaches, less than one year old. The substitution of the 19-passenger type X Yellow coach on a ten-minute peak headway and twelve-minute base headway resulted in an increase in gross revenue of 80 per cent, or 4.7 cents per coach-mile, and a reduction of approximately 7 cents per coach-mile in operating costs. The rapid increase of more than 100 per cent in passengers soon required a change in schedule providing a six-minute peak and a ten-minute base headway.

The Point Breeze line originally was 6½ miles in length. In December, 1927, it was extended a distance of 1 mile to Wilkinsburg, a community also served by trolleys and a steam railroad. The response to coach service was so great that we were unable to handle the traffic with a six-minute headway using 19-passenger coaches, so we placed in service 35-passenger coaches on a five-minute headway. The base schedule is being operated every six minutes with 19-passenger coaches.

Many Riders Former Automobile Users

A survey on this route showed that 68 per cent of our riders formerly were private car drivers, the balance having used trains, taxicabs and street cars. The information was secured by distributing double-faced stamped postcards among the passengers and requesting that they be filled in and returned by mail. The service on this route has become so popular that from 7 p.m. to midnight it is necessary to run the buses on a ten-minute schedule to handle the traffic.

Following the change of headway on the Wilkinsburg route, the same plan was followed on our Squirrel Hill line. The ten-minute peak headway, maintained with 29-passenger street car type coaches, was reduced to a six-minute headway, using 19-passenger coaches. This change caused an increase of 20 per cent gross revenue but, on account of increased mileage, revenues per coach mile were reduced 1 cent. There was a reduction of approximately 6 cents per mile in operating costs.

The substitution of close headways for long headways has been followed on the East Liberty and Mount Lebanon routes, and with the same results. On the East Liberty route the peak headway was shortened from ten minutes to four minutes and on the Mount Lebanon from ten minutes to six minutes.

Table I—Coach-miles, revenue and earnings per coach-mile of four routes of the Pittsburgh Motor Coach Company for corresponding six-month periods in 1928 and 1927.

	Coach-Miles		Total Revenue in Dollars		Earnings in Cents per Coach-Mile	
	1928	1927	1928	1927	1928	1927
Wilkinsburg	281,742	150,367	122,852	46,591	43.7	31.0
East Liberty	201,315	184,232	106,989	89,768	53.1	48.7
Squirrel Hill	180,664	125,726	57,502	47,021	32.0	37.4
Mount Lebanon*	128,479	73,367	32,348	18,149	25.2	24.7
Total	792,200	533,692	319,691	201,529	40.4	37.8
Increase	48.4 per cent		58.6 per cent		2.6 cents	

* Route established in March, 1927. Figures are for four months only in 1928 and 1927.

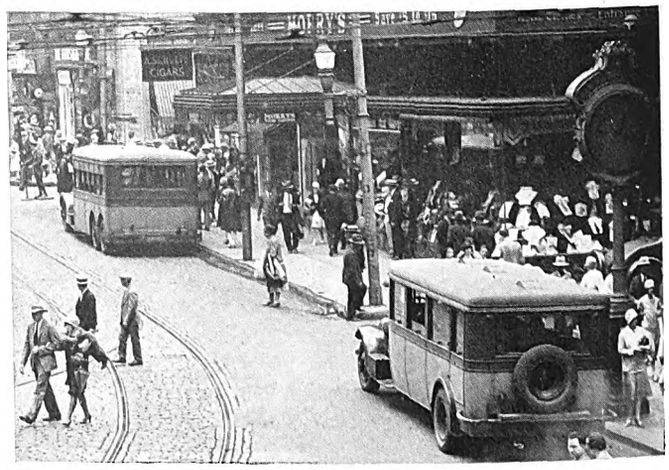
The increase in traffic on the first four routes established, for the first six months of 1928, as compared with the corresponding period of 1927, is shown in Table I. In Table II, the operating costs are given for corresponding periods of five months in 1928 and 1927.

The latest city de luxe line to be established extends to Highland Park by way of Schenley Farms and is 7.2 miles long. It serves two high-class residential sections in which are located practically all the apartment hotels in Pittsburgh. At a point approximately 1½ miles from the outer terminal it connects with the East Liberty route. Passengers wishing to reach the section of the downtown area served by the East Liberty route may change at this point. Likewise the Highland Park line receives passengers from the other line.

That this de luxe type of service appeals to the public is best evidenced by the number of requests received from other sections of the city for the establishment of similar service. At this time applications are pending with the Public Service Commission of Pennsylvania for the establishment of two additional city de luxe lines and one suburban de luxe line. All three are expected to be started this year.

In the establishment of these lines from the residential sections to the downtown district the routes have been laid out in so far as possible to reach the shopping and theater centers, for the greater number of our mid-day riders are the women shoppers who prefer the coaches to their own cars.

During the early days of coach operation, service was



Shoppers and theater-goers find the coaches a convenient and comfortable means of reaching the downtown district of Pittsburgh

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terminated at 7 p.m., but experience with the frequent high speed service has shown that the public will ride the coaches to and from the theaters and for visiting in preference to their own cars and taxicabs. Evening service on all routes is now on a profitable basis.

With the establishment of a new route, direct mail advertising is used to acquaint the residents of the districts served with the new service. Our mailing list is secured from the customer list of the Duquesne Light Company, an affiliated electric light company serving this district. In territory where it is not possible to secure such a list, the street directory of the Bell Telephone Company is used.

All advertising matter other than our own weekly message is being gradually eliminated in all coaches. In addition to our weekly message, small schedules are distributed to all our patrons showing the leaving time of the coaches on each route. Billboards advertising private party and sight-seeing service also are used as well as newspaper advertising.

For mid-day and evening service, 19-passenger coaches of this type are used on all the Pittsburgh routes

Short Headways and High Speed Essential

To attract persons who are accustomed to having their own cars at the curb, it is essential to give short headways. Short headways generally imply the use of small vehicles, although on two lines at this time short headways during the peak hours require the use of large vehicles. To attract autoists it is necessary, further, to give them good running speed between terminals. Frequent stops would annoy them. The average scheduled speed of coaches on the various routes is 12.8 m.p.h. The use of boulevards on all routes helps in averaging this speed.

Our routes range from 5 to 7.5 miles in length. On only two routes do we enjoy two-way business. Most of the riders on all these routes are carried for the greater part of the run. There is, therefore, not enough short-haul traffic to justify a low rate of fare.

The rate necessarily is fixed by the relation between actual cost and possible income. A reduction in fare large enough to attract more patronage would either lower the standard of service or require the addition of more vehicles. With the present fare, the company is certain that the great mass of riders come from persons who have not been regular trolley patrons. The coach service is self-sustaining today without making a false showing through the taking of trolley patrons. All experiences to date point to 25 cents as a proper peak load fare with a slight reduction of price to obtain the advantage that tickets offer in speeding up passenger interchange.

There is no denying that the public is interested in travel by de luxe motor coaches. This fact is best evidenced by the demand for additional de luxe lines and the increase in traffic on all routes. The luxury of yesterday is the necessity of today. The standard Pullman is now patronized by people who formerly rode only in day coaches. The class who rode in standard Pullmans now seek compartments with beds instead of berths.

There would be no reason for attracting street car passengers to a rival service at equal or little higher fares. There is, however, a worthy field in building up a service offering speed, exclusiveness and quality, to attract persons now crowding the public highways with vehicles that use an inordinate amount of street area per rider.

Table II—Operating expenses of Pittsburgh Motor Coach Company for corresponding five-month periods in 1928 and 1927.

Operating Expense	Cents per Coach-Mile 1928	1927
Conducting transportation	12.8	14.3
Plant and equipment*	8.5	6.8
Traffic	0.6	0.4
General administrative	4.5	4.9
Depreciation	5.4	4.7
Taxes and licenses	1.6	1.3
Total	33.2	31.5

* Includes charge of 2 cents per coach-mile for general repairs during 1928 which is not included in 1927. This amount is reserved for major overhauls.

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Bender body mounted on White chassis, illustrating full headroom effect on bus for de luxe service

Bus Designers Seek

Lower Cost Per Passenger *and* Greater Reliability

BY
J. W. McCLOY
Assistant Editor
ELECTRIC RAILWAY JOURNAL

"CONSTANT improvements but no yearly models" has been the slogan and policy of a certain well-known manufacturer of automobiles. This may be said to fairly represent the present attitude of bus manufacturers. There is likewise a strong effort to maintain production efficiency through resistance to demands for special design features to meet the fancies of individual operators and the particular requirements of various service characteristics. Resistance to constant pressure for special design changes is in the interest of lower first cost, and the larger bus manufacturers know that they serve the interests of their customers better through the maintenance of production models than would result from acceding to constantly changing demands for special features. Experience is, of course, suggesting many improvements, chiefly in the direction of greater strength of parts and easier accessibility for inspection and maintenance. But often it is months or even years before a particular idea can be designed, engineered, tested, machined and finally put on the market with its maker's seal of approval upon it. During this process there is a continuity of progress that would be lost if the manufacturers were to embark upon a program of designing to meet the views of every individual customer, with the cost of buses mounting accordingly. A survey of the field indicates that there will undoubtedly be many minor refinements and probably a few major changes in bus design within the next year or two.

SEVERAL FACTORS AFFECT DIMENSIONS

Length, width and weight of buses have been the subjects of legislation in nearly every state in the Union, with a lack of uniformity that has been the despair of the designer. Attempts have been made from time to time by regulatory bodies of adjoining states to get together and standardize their rules, but the results have stopped far short of complete accord. Operators and manufacturers alike recognize the necessity of fixing

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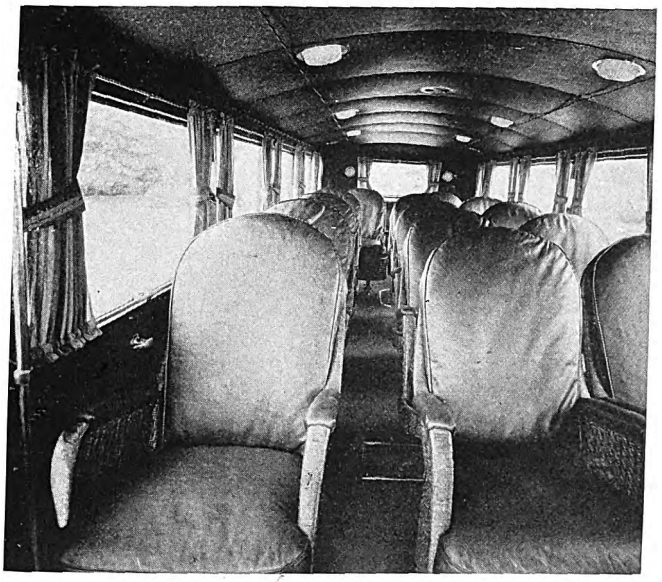
uniform maximum dimensions in such fundamentals as over-all length, width, overhang, etc., but are not hopeful for any general relief. There is an independence of thought and action among regulatory groups that apparently does not lend itself readily to standardization.

At the present stage of development there appears to be little likelihood of a requirement arising for a bus for general use of greater length than 35 ft. Grades, curves and the width of the road have imposed a limitation that needs no legislation to give it effect. Question arises in the matter of over-all width and there is some straining at the present controlling limits. Florida holds this down to 84 in. and a considerable number of states do not permit a greater width than 90 in. Passenger comfort on a long trip is dependent to a great extent upon the width and spacing of seats. Here there are two opposing forces at work: passenger comfort on the one hand and economical pressure for maximum carrying capacity on the other. When it is desired to put four seats in pairs, abreast, and to give to each one all the space that comfort demands, either the aisle must be reduced in width or the body of the bus must be widened. If designers were permitted a little more latitude in this respect they undoubtedly could produce a more commodious and comfortable vehicle.

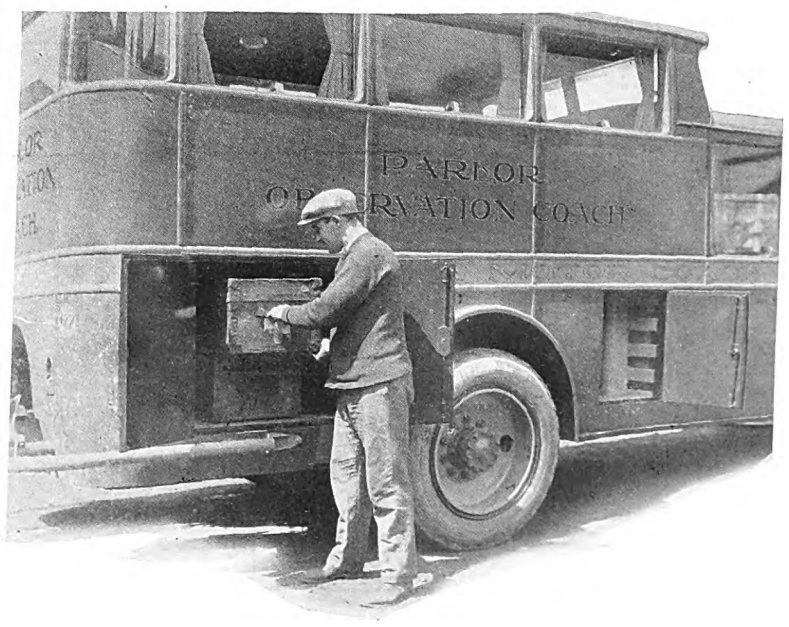


Interior of a Mack de luxe coach with seats in pairs on one side of the aisle and single on the other. This arrangement gives more room for the passengers and adds to the comfort of the ride

But greater widths reduce road clearances, increase the accident hazard, slow down operation and make the bus unpopular in the eyes of other users of the highways. To let down the bars on width would produce ultimately a popular reaction that would result in extremely severe restrictions. The problem is further complicated by the fact that the long distance interstate lines have built up traffic by offering rates materially lower than steam road fares. Because of the lower fares they have increased their bus seating capacity so that sufficient passengers can be carried to make the lines pay. Comfort has been sacrificed in accommodating more passengers, but a trend in the opposite direction toward fewer seats is now in evidence. The clearance of existing overhead structures has limited the height of the bus. This will not prevent, however, the general adoption of full headroom on all buses intended for long-distance service, toward which there is an unquestionable trend.

There has been a spectacular growth in long-distance bus travel. Two distinct services from the Atlantic to the Pacific are now in operation and others are in the process of organization. There is every indication that the number of such routes will increase. This development of long-distance travel brings to the front with increased emphasis the question of seating. A seat that is comfortable for a few hours and endurable for a longer period becomes decidedly uncomfortable for an all-night ride. The Pacific Coast has supported over-night bus travel for several years; it is nothing uncommon for passengers to ride by bus continuously for several days and nights with little relief other than an occasional rest stop. To meet the requirements of this service several manufacturers have brought out the reclining type of seat which offers, however, a rather inferior accommodation for a weary traveler. Closely associated with passenger comfort is the question of tires. Designers, aware of this, have not been slow in adopting balloon tires for buses.

Most of the body manufacturers are inclined to hesitate in manufacturing buses with sleeping accommodations because of the doubtful marketing possibilities, but some of the operators are actually going ahead in this direction on their own initiative. The Pickwick Stages of California has produced a bus with sleeping accommodations for twenty-six people, convertible during the day time into a Pullman type coach. There is little doubt that this will be the forerunner of others of similar design, and if sufficient demand develops the body builders undoubtedly will take steps to meet it. Whether the most acceptable design will take the form of a convertible seating arrangement



The A.C.F. parlor observation coach provides ample storage capacity for baggage under seats at the rear of the body

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Lang light-weight, street car type body on a Yellow chassis. The rear door for exit permits a more rapid exchange of passengers

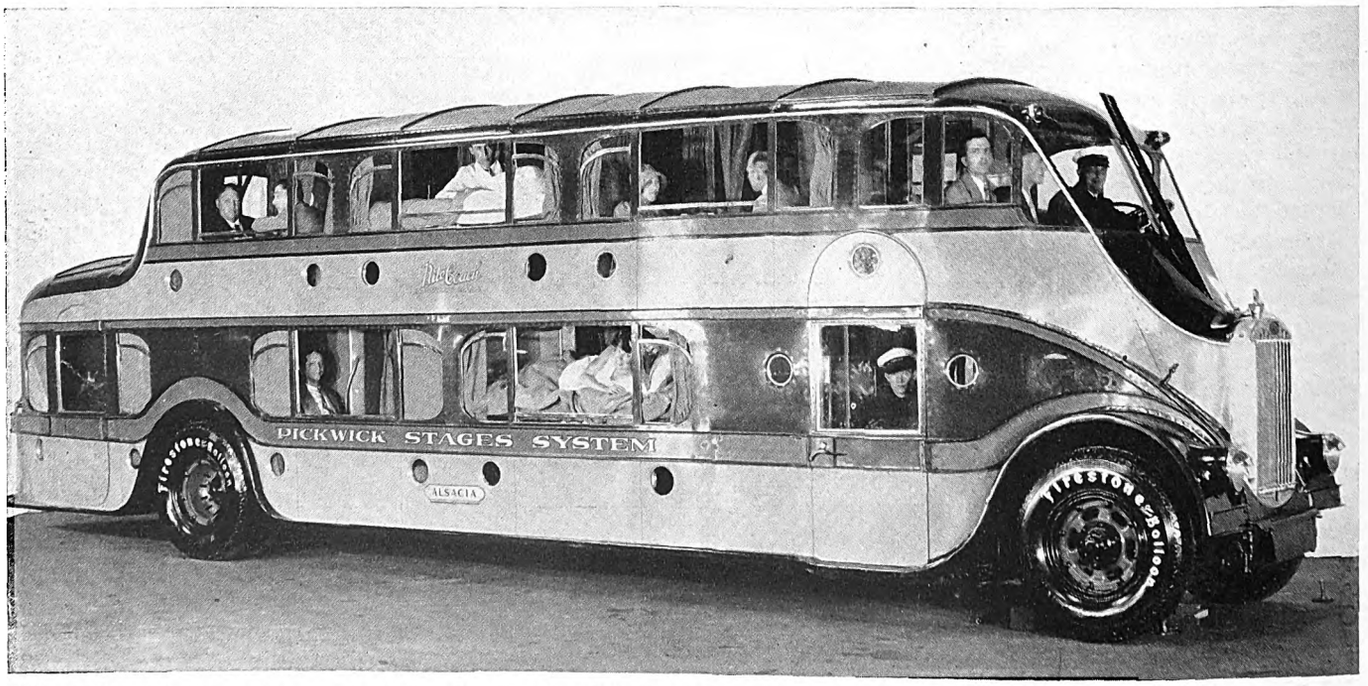
or a permanently made-up berth remains to be decided. If the capacity of the bus is to be reduced it naturally will follow that the cost of the ride will have to increase. A body with built-in berths certainly would offer the most in comfort and convenience but its use would be limited to night runs and as a consequence it would be idle more than half the time.

Baggage handling still presents a distinct problem in intercity service. While still used to some extent the early type of baggage rack, located just over the passenger's head, has been found inadequate and as a result baggage has been carried on the roofs. The present tendency is to eliminate this practice and a number of ingenious arrangements have been devised. Several years ago the Baker-Raulang Body Company designed a full headroom body for interurban service with a more commodious rack than had been provided before. More recently the Bender Body Company of Cleveland has developed a rack along similar lines and the Lang Body Company has provided commodious interior racks in some of its recent bodies. With such an arrangement the passenger stows his own baggage and is responsible for it to a greater degree than when it is intrusted to the care of the driver.

The parlor observation coach of the American Car & Foundry Company was designed to provide a weatherproof baggage compartment of ample storage capacity at the curb level. The compartment has a total space of 140 cu.ft., with 53 sq.ft. of floor space, with doors at the rear and at both sides sufficiently large to admit a good-sized steamer trunk or sample case. An incidental advantage of this arrangement is that the wheelhouse seating problem is avoided and a considerable portion of the passenger load can be isolated from engine noises. Other special designs for coaches include a good sized compartment taking up the entire rear section of the coach body, with a full length door either at the rear or side through which baggage can be deposited. This arrangement, of course, can only be effected at the sacrifice of seating space.

An owner of a large bus system, who still favors roof storage, has arranged a two-level platform at terminals and all principal stations. Baggage is checked and deposited on the higher level as it arrives at the station and is shifted directly to the roof of the bus while the passengers board. Some managers profess to see the possibility of separate trucks, scheduled the same as the passenger vehicles, to handle luggage and express packages exclusively.

Lavoratories and toilets of the chemical tank type are being installed on many of the later intercity models. Neither owners nor body builders favor them, however, and there is a question as to whether there is any real demand for them on the part of the public. They take up



"The Nitecoach," a motor coach sleeper developed and built by the Pickwick Stages System for service on the Pacific Coast

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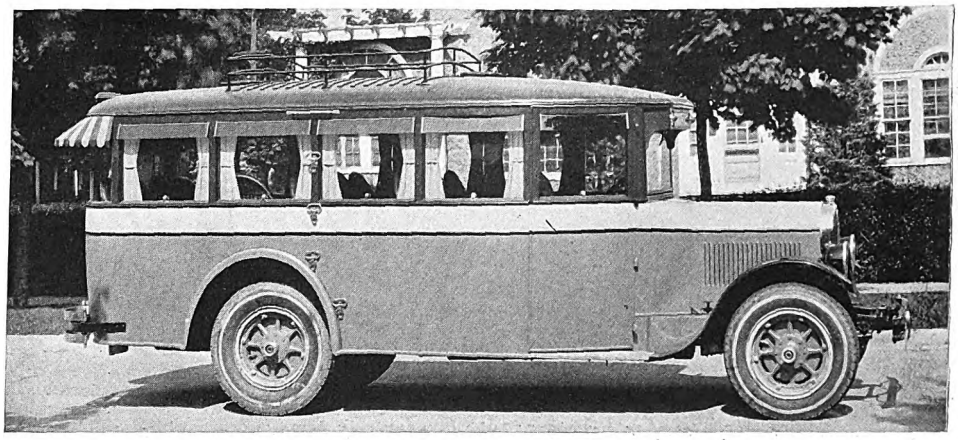
space that might otherwise be used to good advantage, are unsanitary and are offensive to most persons. With rest stops properly arranged there should be little need for a toilet on a bus and the opinion that it may be dispensed with entirely is held by the majority of operators.

On a few of the Pacific Coast routes buses have been furnished with buffets. This is looked upon by most companies as a "billboard" or advertising feature. It is of doubtful value and the idea does not appear to be making much progress. While there is room for improvement in most of the lunch counters in bus terminals and at rest stops along the lines, the remedy does not appear to be in installing buffets in the buses.

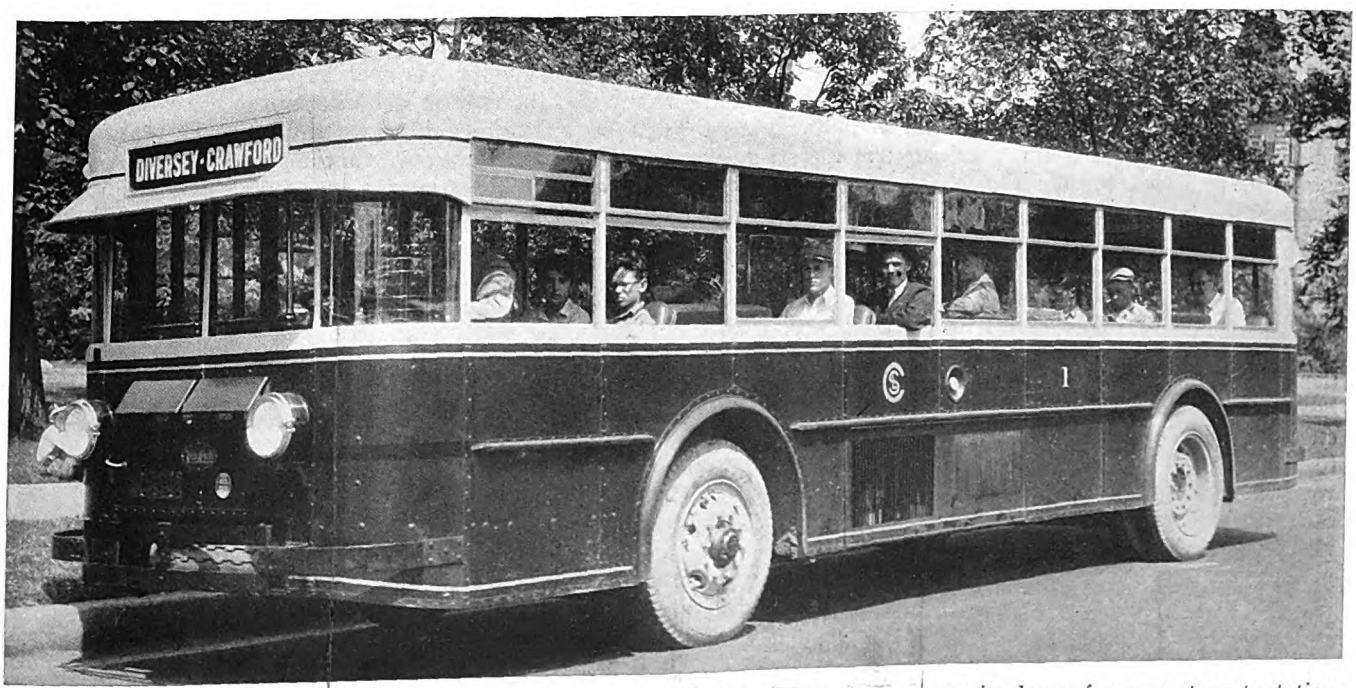


Small capacity semi-de luxe body developed by FitzJohn Manufacturing Company for service where buses of larger capacity are not warranted

The body requirements of conventional city buses are well standardized and have changed but little in several years, with the notable exception of the 40-passenger units designed for mass transportation. Built for short hauls and frequent stops the principal features of the accepted designs are a low step, wide entrance, doors that can be opened and closed quickly and with little effort, as large a proportion of cross seats as practicable, space for standees and sufficient headroom to clear the hat of a tall person. Application of the circulating load principle of handling passengers by the use of an automatic rear exit seems to be gradually growing in popularity, particularly among those users who operate street cars. Usual practice is to have longitudinal seats over the wheel housings with a well for standees between. However, one of the largest fleet owners, the Public Service Co-ordinated Transport, with headquarters at Newark, N. J., locates the standing bay in the forward end of the bus. The use of individual bucket type seats in city buses is being extended.

The 29-33 passenger unit has established itself securely in city service where moderately heavy traffic is the rule. For feeder service the 21-passenger body is growing in favor and for handling mass loads the 40-passenger coach has in new territory supplanted the double-decker.

Although not a creation of the past year, strictly speaking, as the first models were on the streets shortly before the 1927 convention at Cleveland, the heavy capacity single-deck coach may be said to have come into its own within the past twelve months. Several manufacturers are now producing them, and the number in use is increasing steadily. Seating from 40 to 45 passengers with a high degree of comfort, the coaches are carrying peak loads of considerably more than 100 passengers. A number of electric railway executives, conservative in their attitude toward the conventional type of bus, lean toward the 40-passenger coach because it approaches more nearly their views of city service carrying capacity standards. It marks the arrival of the bus as a unit in the field of mass transportation. In carrying capacity alone



Twin Coach being used in feeder service by the Chicago Surface Lines. The large capacity buses for mass transportation are a recent development

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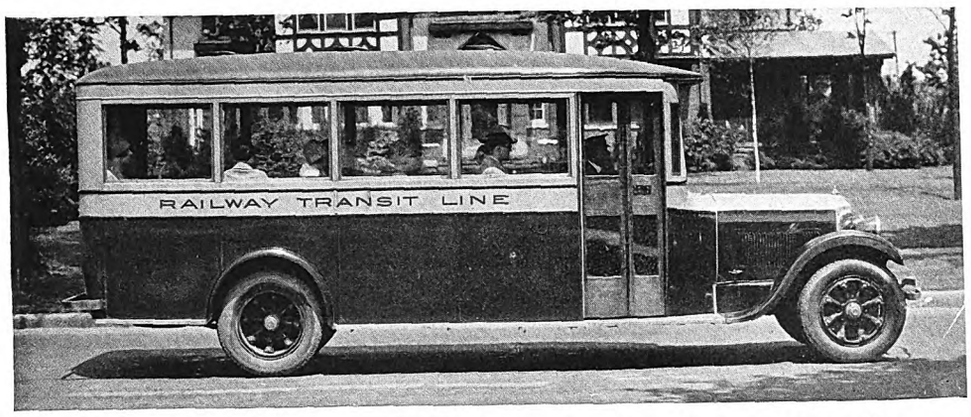

Studebaker 21-passenger street car type bus for city service where capacity requirements are light

it has little superiority over the double-decker, but from the standpoint of accessibility and time to load and unload it probably has a marked advantage. Its use is not confined to city service. It has been adopted for long intercity bus routes and an increasing number are being ordered for service of this character. Several manufacturers have developed variations in the large capacity design. The use of one large motor in the rear with gas-electric drive as in the Versare type of unit, being used by the Montreal Tramways and the Third Avenue Railway of New York City, represents one of the variations from the usual design to obtain larger capacity within limited over-all dimensions.

A departure from the general trend and one that will be watched with a great deal of interest is the development of the medium capacity body with semi de luxe appointments, mounted on a low chassis of long wheelbase, giving it an exceptionally pleasing general appearance. Generously dimensioned, well-upholstered seats, arranged in pairs on one side of the aisle and singly on the other, supply an atmosphere of comfort that is missing in the average bus of higher seating capacity. Approaching the private auto in speed, exclusiveness and general appearance and making a special appeal for patronage to the man who usually "drives his own," this type of bus should fit in exceptionally well in providing fast express service in cities, in serving as a feeder where the larger type of bus is not warranted, and in certain classes of intercity service. Because of its lighter weight a high-powered motor is not necessary; in fact, a stock engine as provided for the average high-class passenger automobile should be sufficient. Needless to say, this will be reflected in a lower first cost, which is an end in itself worthy of consideration.

Much as the designer and owner would like to avoid it there is a trend toward heavier buses. The preference for more powerful motors leads directly to greater weight, as do most of the other refinements and improvements which are being given attention. The trend toward more powerful motors for practically all sizes of buses is particularly to be observed in models intended for the long-distance runs. This is demanded to give quicker movement in traffic and a higher average speed through hilly country, and several manufacturers are preparing to turn out engines rating up to 150 hp. to meet this requirement. There will be better correlation between engine and drive and, quite probably, a reduction in gear ratio. In addition to increasing the weight this increase in power will call for higher initial investment, greater fuel consumption and higher maintenance expense. Compensating advantages on the long runs will be a higher average sustained speed, reducing the number of units required to maintain a given schedule. The six-cylinder engine is rapidly replacing the four in this class of service. Introduction by General Motors of a low capacity model equipped with an eight cylinder V-type engine represents a step in the direction of the eight-cylinder motors in buses. Magneto ignition to a considerable extent is being replaced by battery ignition.

Gas-electric drive, introduced several years ago, has won favor with several of the largest fleet owners and it is significant that this pattern appears to make its greatest appeal to those long engaged in electric railway management.

Bus manufacturers have given careful and particular attention to refinements of brake design, but despite all the progress that has been made in this direction too large a proportion of the difficulties encountered by drivers arises from brake troubles. The larger manufacturers are still divided in their preference for manual, air and vacuum booster installations, with much to be said in favor of each. The industry unquestionably has been aided by the manufacturers of electric railway and steam railroad brakes who have entered the field.

There seems to be a general impression among bus manufacturers that the cost of buses is going to increase. Development work has been expensive, sales expense is heavy and the market is by no means unlimited. There will be a steady and increasing demand for years to come but nothing to warrant mass production and the economies that accompany it. But a higher price for buses may mean better buses and that, after all, is what the industry is most interested in.

Standard Dodge-Graham city type bus used in auxiliary feeder service in Detroit

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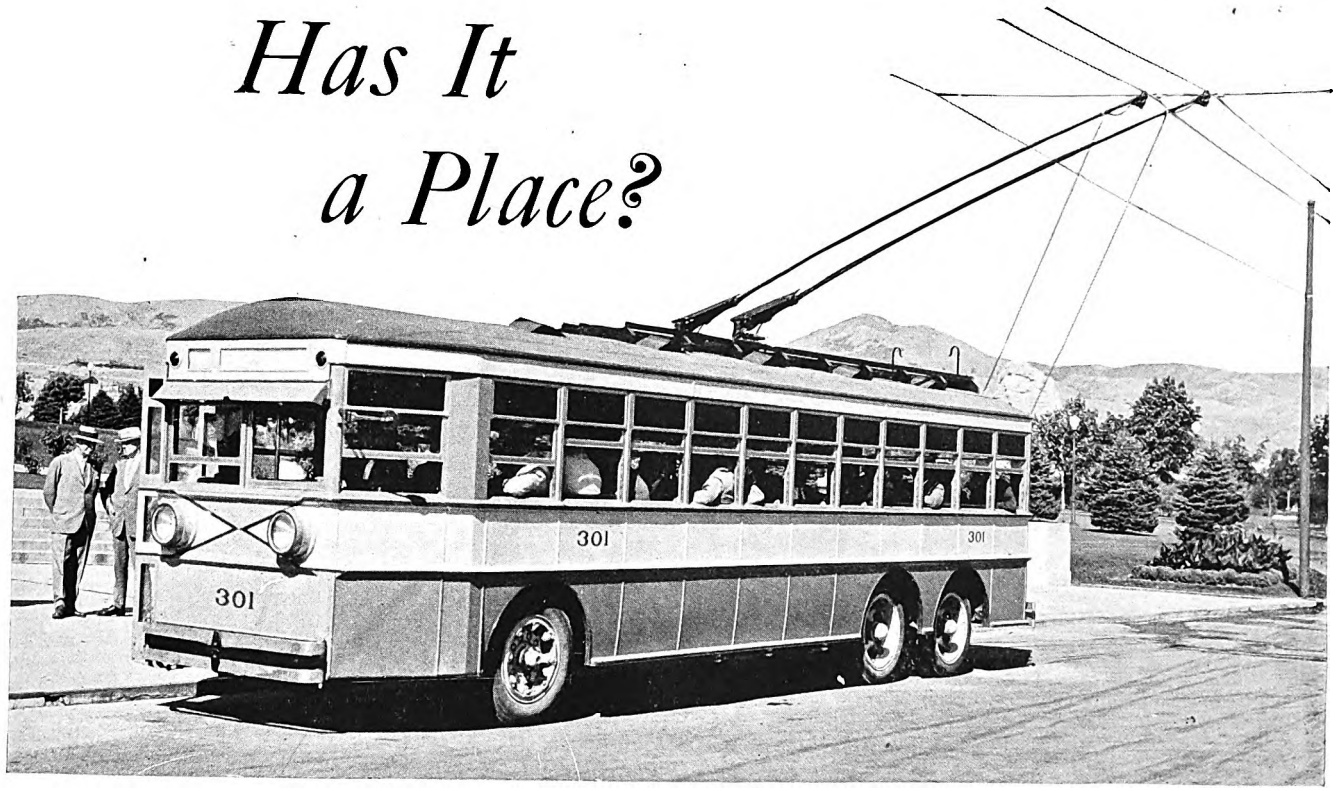
The TRACKLESS TROLLEY *Has It a Place?*



Patrons of one of the Utah Light & Traction Company's lines in Salt Lake City are now riding on a new type of vehicle—the electric coach

BY

EDWARD A. WEST

General Manager
Utah Light & Traction Company
Salt Lake City, Utah

New type trackless trolleys for Salt Lake City may solve many urban transportation problems. Low operating cost, light weight and high speed are important features

ROAD vehicles propelled by electric motors that obtain their energy through trolley poles from overhead wires are not new. This type of operation has proved practicable in European and other foreign countries and, as everyone in the street car business in this country knows, was worked out a number of years ago in America. There are several companies in this country that are operating trackless trolleys every day.

Whether due to the energy with which gasoline bus manufacturers have promoted their product or because of the ungainly, awkward, unattractive design and insufficient power of the early trackless trolleys, the fact is that the latter vehicles did not in general meet with much favor. The installation at Staten Island failed to interest street car men. However, another installation at Rochester, N. Y., is still going on satisfactorily, the writer is informed. The trolley buses in Albany also operate every day, doing their work efficiently. These examples were only the forerunners of something larger, speedier, more powerful and of more attractive design. We are indebted to the gasoline bus manufacturers for showing us the way to make our rolling stock better looking and more appealing.

In Salt Lake City the street railway company has for many years given service over more miles of track than needed to meet the city's transportation requirements adequately. Deferred maintenance on tracks and pavement was piling up at a rate entirely beyond the earnings of the company. As a result, abandonments were resorted to through regular proceedings before the Public Utilities Commission of Utah, and the trackage was decreased steadily from 144 miles of single track on Jan. 1, 1925, to 116.5 miles on Jan. 1, 1928. Permission was obtained on March 23, 1928, to remove more than 9 miles of track that was paralleled on either side and but one block distant, so that, at the time of this writing, only 107 miles of single track are being operated.

After the trackage was thus reduced everything seemed to be going along satisfactorily until the company was faced with the necessity of reconstructing and repaving 4 miles of single track. Furthermore, there were attendant future paving liabilities which would have aggregated about $174,000. This particular line is well patronized. It serves a well built-up district where there is no paralleling car line on either side for more than a quarter of a mile. It is paying as well as any of the company's lines.

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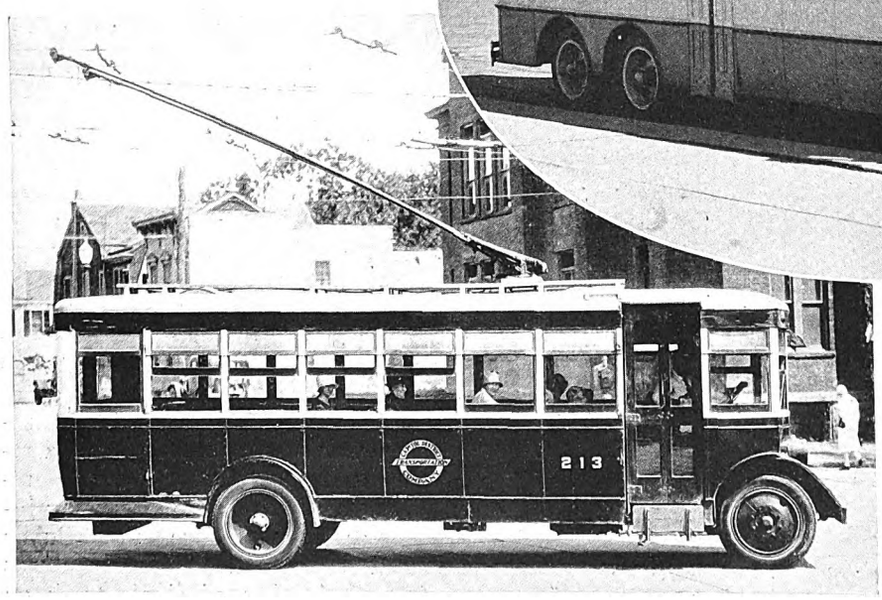
The Salt Lake City electric coaches are a radical departure from the first trackless trolleys built in this country in general appearance, design and attractiveness



A trial run of the Salt Lake City electric coach was made in the presence of state, city and railway officials on Aug. 20, and regular service started a few days later. Note how the vehicle can approach the curb for exchange of passengers

The Capitol District Transportation Company, Albany, N. Y., has been operating trolley buses of this type in Cohoes, since November, 1924

Therefore, abandonment of the route seemed to be out of the question. Considerable study was given to determine the most economical transportation medium with which to give the service. If the track were rehabilitated and paved, street car operation could be continued with the same rolling stock as that serving our patrons on other lines. The company's experience with gasoline propelled vehicles would indicate that this instance did not justify the substitution of available types of buses for the street cars. Sound transportation merchandising theory dictated the furnishing of something attractive, comfortable, safe and speedy. Could some type of transportation equipment be found that would not run on rails and yet would utilize the power plant, substations and overhead investment, the property write-off would be greatly reduced. Trolley buses seemed to be the logical answer.

Revival Suggested by Recent Bus Developments

At the last convention of the American Electric Railway Association several radical types of gas-electric buses were shown which suggested resurrection of the trackless trolley idea. A trolley bus seating 45 passengers, utilizing light-weight, high-speed, 50-hp. motors and with all the luxuriousness of the most modern and up-to-date city bus seemed to offer a number of economic and

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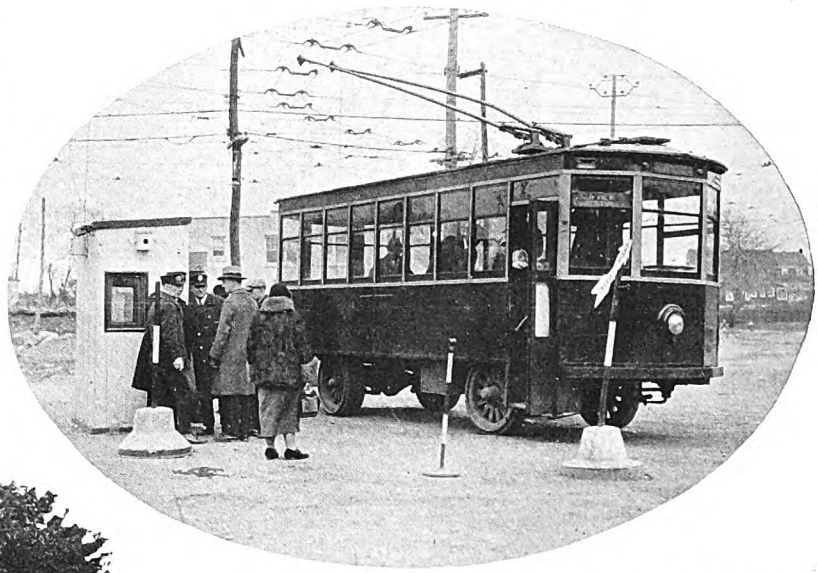
operating advantages. Estimates were prepared to cover the expense of installing this new type of trolley bus and it was found that the cost of the bus installation, including the construction of the necessary double trolley with all the special work, would be about the same as the cost of track and pavement for this route. Best of all, patrons would be furnished something modern, power investment would be conserved and future maintenance of track and pavement would be eliminated.

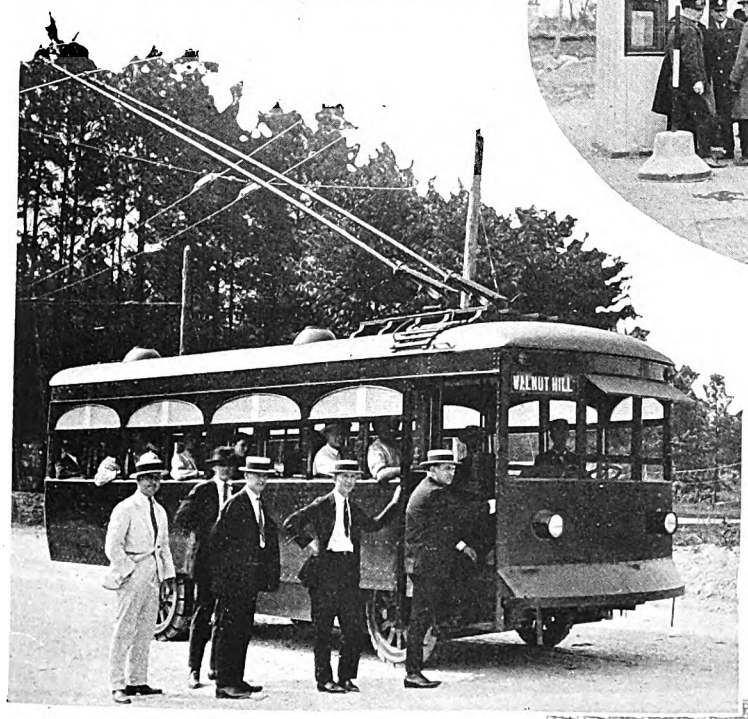
Certain difficulties now presented themselves. It was necessary to make application to the city commission for a franchise amendment permitting operation of electric coaches. Some of the city commissioners were rather hesitant about granting a franchise for this strange and foreign type of operation, as they were unable to grasp the idea of flexibility together with the appearance of double trolley over the streets. They were also fearful that the operation would not be practical. Inasmuch as it was impossible to demonstrate trolley bus operation to the commissioners, a hurry-up request was sent to the Eastman Kodak Company in Rochester, N. Y., and J. F. Uffert of the New York State Railways for a motion picture of Rochester's trolley buses. This seemed to be the only way to present the idea effectively to the city officials. On its receipt four days later the film was shown to the heads of the city government. City officials were quick to see the advantages of this mode of transportation and at a hearing held on the following day an amendment to the franchise was granted, permitting operation of electric coaches. An order was then placed for ten trackless trolleys, or as we call them, "Salt Lake City Electric Coaches."

There is as much difference between the new electric coach and its progenitor, the trackless trolley, as there is between the horse car and the latest electric street car. It embodies some of the best features of the gasoline bus, the gas-electric bus and the electric street car. The earlier trackless trolleys looked awkward and they were hard riding because of solid rubber or high-pressure pneumatic tires, poor spring design and short wheelbase. They were bulky and cumbersome because they were equipped with heavy railway motors, the only motors available at that time. This made floor heights unreasonable. Relatively low power limited the speed. Because of their height their appearance was exceedingly awkward and their lines were blunt and broken with sharp angles.

Trolley Bus Offers Attractive Economies

Aside from the operating features of the electric coach there are many other factors that had an important bearing upon the decision to take this revolutionary step. The gasoline bus did not receive serious consideration because its power costs were prohibitive, being in the neighborhood of $26,000 annually against $7,000 for the electric coaches for the route under consideration. In addition it was necessary to substitute a type of vehicle that was

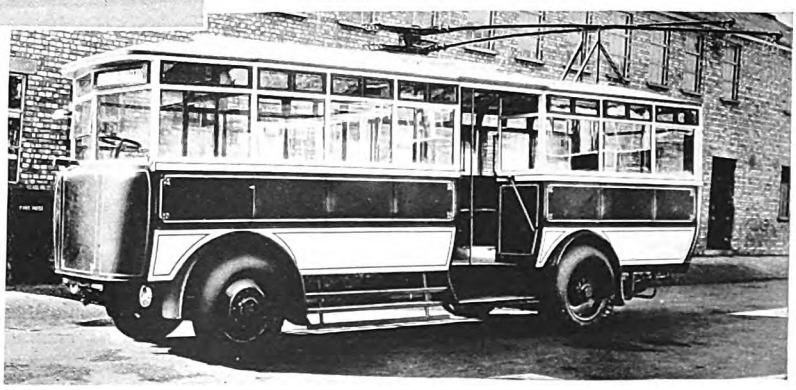




Upper view—Heavy railway motors in the Staten Island trackless trolleys made them sluggish in action. The motors also necessitated increased floor heights, giving the trolleys an awkward and ungainly appearance

At left—Type of vehicle used in Petersburg, Va., from June, 1923, to December, 1926. It was expensive to maintain and operate, and was hard-riding because of its solid rubber tires, its spring design and short wheelbase

Below—England has developed the trolley bus to a high degree and has adopted it in several cities. This bus with pneumatic tires, extra long springs, and seats of the semi-bucket type is one of 30 being used in Ipswich, England



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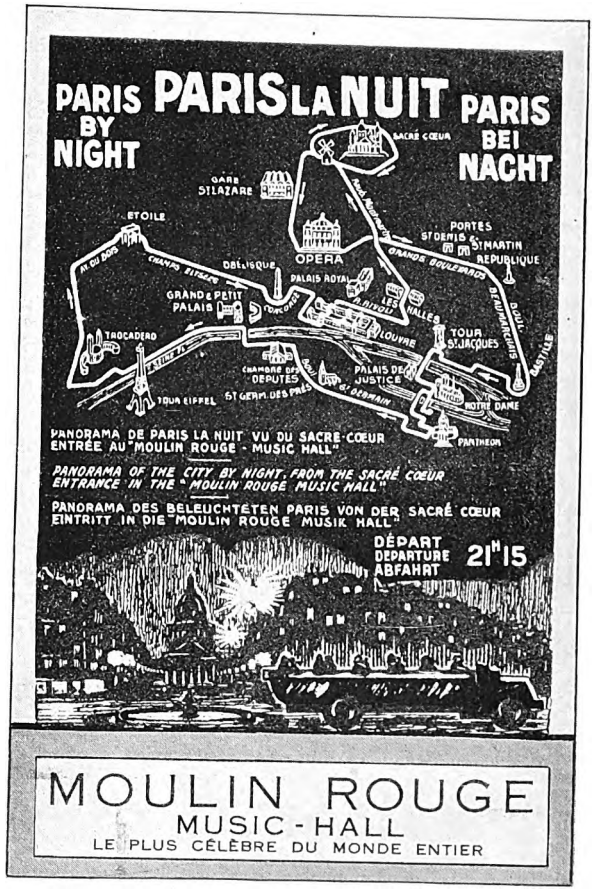
Maps Help to Sell Transportation *in Europe*

BY

HENRY W. BLAKE

Senior Editor

ELECTRIC RAILWAY JOURNAL



Bus tour circulars usually show a map of the route covered

MANY foreign electric railways and bus companies are paying much more attention to selling transportation by informing the public of their routes and service than are the electric railways of this country. They are using numerous maps, bulletins, direction signs and other devices in their cars and buses, in their stations and on the streets, to help the patrons use the service and to encourage travel. A conscious effort is being made by them, not only to assist the old residents of the cities, but also visitors and new residents. As a result many people who would otherwise travel by taxi, horse-drawn cab or automobile, ride the street cars or buses regularly. Several recent articles in ELECTRIC RAILWAY JOURNAL, particularly that entitled "Answering Questions Before They Are Asked," on page 1150 of the issue for Dec. 24, 1927, have given an account of the method usually employed in using street and station signs. Maps also are valuable for this purpose.

FOREIGN electric railways and bus companies use route maps liberally to encourage travel. These are distributed at a nominal charge or gratis. Maps specially designed for the convenience of passengers are mounted in cars and buses in several cities

The route map is a strong ally of the European street railway and bus traffic manager in gaining passengers. He displays it in all possible places. It is somewhat strange that American companies have used this method so little, because a great proportion of the American public, through automobile touring, has become very much accustomed to the use of maps. At present the customary way by which a potential passenger in America finds out where to take a street car or bus to a place, if he does not know where it is, is to ask at a store or of some person on the street. But often the directions which a stranger in an American city receives from such sources are as confusing and meaningless to him as a Chinese laundry ticket. Especially is this the case when the car line is some distance away and one or two transfers have to be made after the journey has been begun.

As a rule the rapid transit lines in this country have gone farther than the surface lines in the use of maps. With them, it is not uncommon to have in the cars and sometimes at the waiting stations framed maps showing all the routes operated.

Maps of this kind impart some information to the passenger and so are better than nothing; but they could easily be made more useful. Thus, the maps posted in the stations could be marked with a large arrow or in some other way to indicate the place on the map of that particular station. Similar maps, except perhaps on a larger scale, but marked in the same way, could be posted at each entrance to each rapid transit station. They would then be in a place where they could easily be consulted by the would-be passenger who would not have to climb up or down to the station platform and pay his fare to get on the platform before he could consult the map.

Large maps of this kind displayed at the entrances

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In nearly every large city abroad maps showing all the electric railway or bus routes can be obtained free or for a nominal charge. These are covers of maps issued by electric railway or bus systems

to the stations have been found by the rapid transit lines of London and Paris to be excellent advertisements for their service. They form a constant invitation, particularly to the stranger, to patronize the rapid transit lines, rather than a taxicab, in getting about town. The fact that each map is marked with a star or arrow indicating the point in the city where it is posted helps the stranger to orient himself. It also enables him to become familiar with the layout of the rapid transit lines. Such a map in London and Paris is often accompanied by printed data relating to train service, such as owl schedules.

The European rapid transit lines mentioned carry in their cars another kind of map equally well adapted to convey to the passenger the information which he needs. After he has taken his place on the car his need is no longer the same as it was before he boarded the train. He has learned from the station map the proper route to take, and his principal need now is to know when to get out. For this purpose a very simple map which shows only the stations on that particular route is most helpful. Such a map is carried in every rapid transit car in London and Paris. In the latter city it gives even further information. It shows not only all the stations and the junctions, like the London map, but also the names of the principal cross streets near each station, with their nearest house number. Such a map, used on the Paris Metropolitan Railway, was reproduced on page 1153 of the issue of ELECTRIC RAILWAY JOURNAL for Dec. 4, 1927.

Of course, where such a map is posted in a car, it has to be changed if the car operates over a different route. This means some complication, but the managements think the advantages are worth the trouble. On the Hamburg subways and elevated railways, a map is painted on the ceiling of each car. The rapid transit routes in Hamburg are somewhat like those in Chicago, that is, the system has a central loop with various

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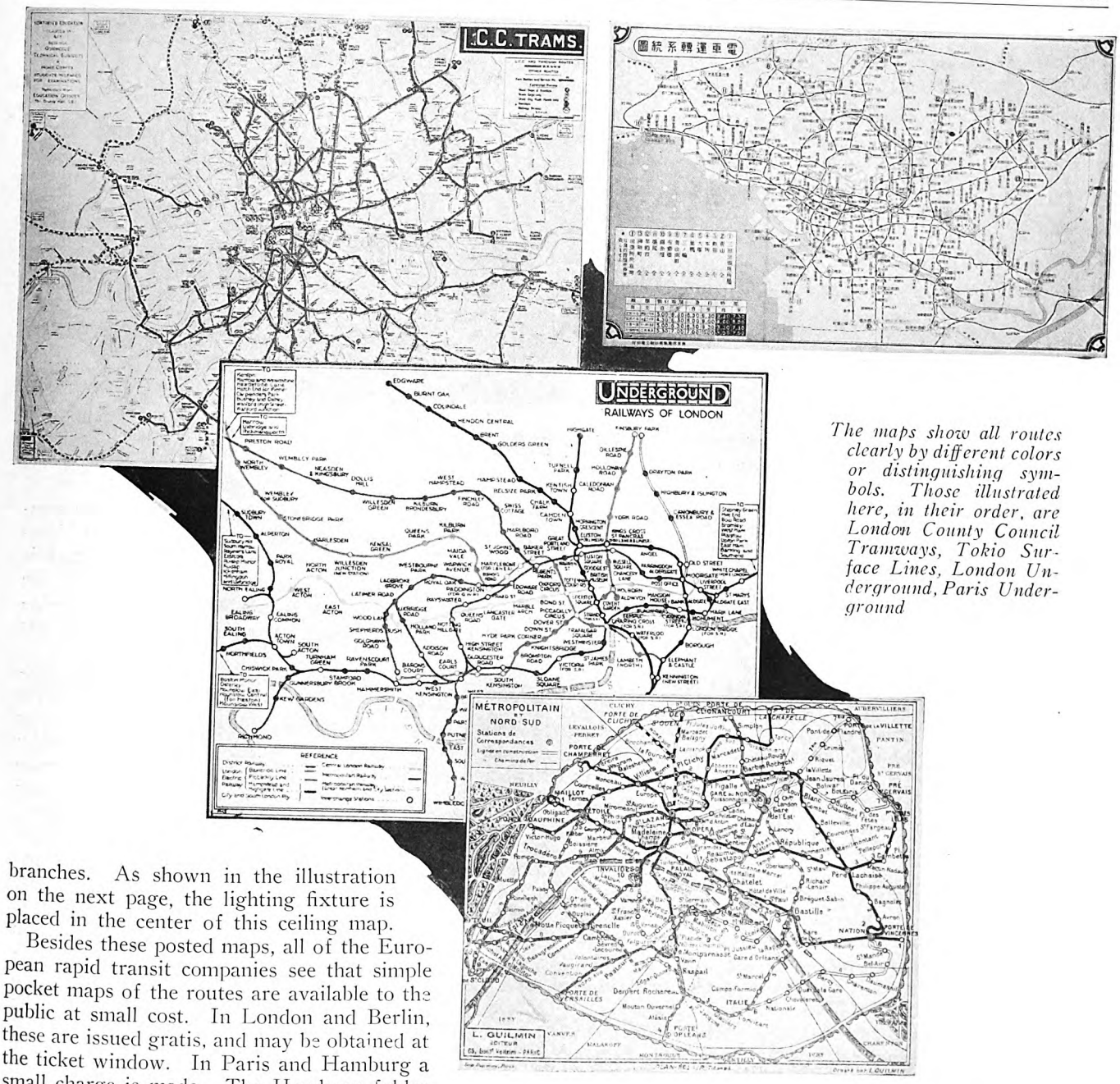

The maps show all routes clearly by different colors or distinguishing symbols. Those illustrated here, in their order, are London County Council Tramways, Tokio Surface Lines, London Underground, Paris Underground

branches. As shown in the illustration on the next page, the lighting fixture is placed in the center of this ceiling map.

Besides these posted maps, all of the European rapid transit companies see that simple pocket maps of the routes are available to the public at small cost. In London and Berlin, these are issued gratis, and may be obtained at the ticket window. In Paris and Hamburg a small charge is made. The Hamburg folder includes a map of the surface car routes, as both modes of transportation are activities of the same company.

Surface Railways Also Issue Maps

A few surface railways in the United States issue maps showing routes. Abroad the practice is almost universal, both with the railways and the bus lines in the larger cities. The maps are usually of pocket size and are given away or sold for a slight charge. The fact that each railway or bus route has a distinctive number carried in a conspicuous place on the hood helps the intending passenger to identify the routes on the map. Occasionally an enterprising hotel will publish a map of the city in which it is located, with the position of the hotel and the routes of all car lines passing the hotel printed in red upon the map. Such a map without the car lines is not uncommon here, but who ever heard of an American hotel getting out a special map showing the car lines passing the front door? Such a map in four colors issued by a hotel in Naples, Italy, is reproduced.

On all the maps issued, whether by the company or privately, the numbers of the several car routes are always printed close to the route lines, and in a corner of the map there is generally a key which gives the names of the termini and the principal points passed by each of the routes. This method is followed even as far away as Tokio, as may be seen from the accompanying reproduction of a map and time-table issued by the Tokio street railway system. Often another table gives the headways followed during periods of the day on the several routes. Frequently the map is combined with a leaflet or booklet giving complete time-tables and other data of all the routes, as in London, Paris, Rome and Hamburg.

Sometimes framed route maps are carried inside the bus or car, as already mentioned in connection with the rapid transit lines. This method is followed in Paris, and one of the maps so carried was reproduced on page 1153 of the issue of the JOURNAL for Dec. 24, 1927.

Some surface line companies also follow the rapid transit plan of posting large maps of their routes at

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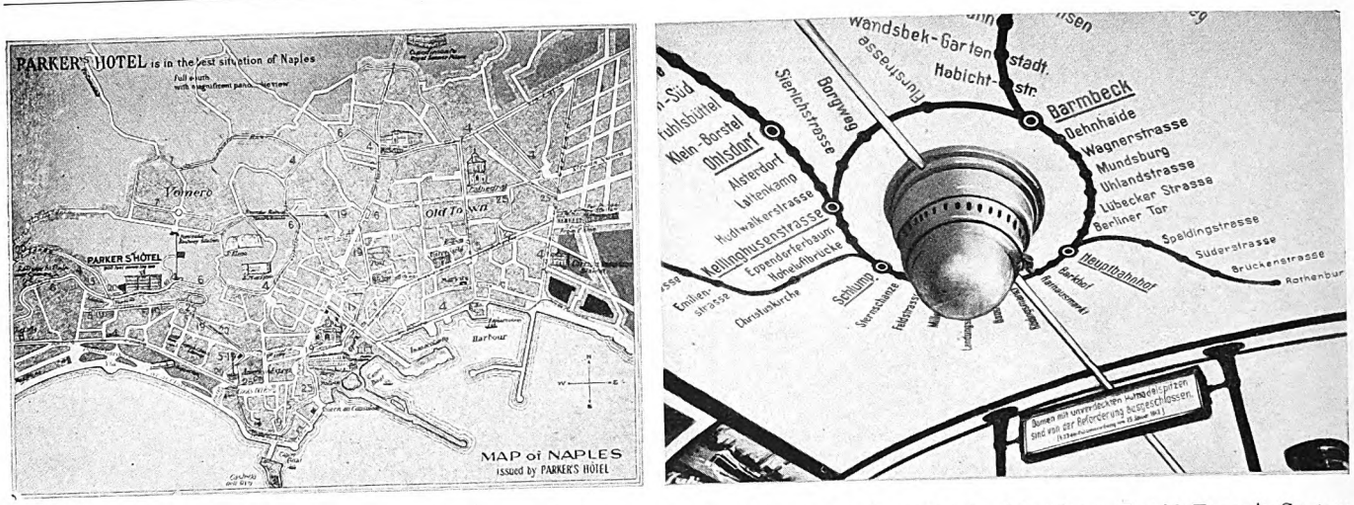

At left, circular issued by hotel to show tramway routes passing its entrance. At right, the Hamburg Rapid Transit System paints a map of its routes on the ceilings of its cars

various points to help potential passengers to select their route. This is done in Paris and Dortmund. The London County Council goes even farther by the installation at several points of a large map equipped with an electrical device known as a "pathfinder." By pressure on the proper button a traveler can light a series of electric lamps which trace for him the shortest route from the place where he is standing to any desired point in London, if it is reached by any of the tram lines of the London County Council. He also is told the route number of the car which will take him there. A view of persons operating this device at a passenger waiting station on Victoria Embankment near Westminster Bridge was published on page 395 of the issue of this paper for Sept. 3, 1927. The station itself is shown below.

To show how general is the practice of publishing pocket maps with car routes on them and how similar in general appearance these maps are, whether they are for England, France, Germany, Italy or Japan, a number of them are reproduced. It should be understood, however, that all of them are in colors, usually three colors and often more, so that a black and white reproduction, in which the colors are not distinguished, does not do justice to their attractive typographical appearance.

So far but brief reference has been made to maps issued by bus companies, but where a considerable bus service is given, as in London and Paris, route maps are published similar to those mentioned for tramway companies. In addition, it is worthy of note that the sightseeing and touring buses, most of whose business is "new" business each trip, usually include maps of the routes traversed. A map issued by a "Seeing-Paris-by-Night" bus company is reproduced at the head of this article.

Since the development of the touring bus, many personally conducted trips of from one day to two weeks or more have been established by the larger tourist agencies, like Cook and American Express, as well as by smaller agencies and individual bus companies. These trips are attracting the patronage of a continuously larger number of tourists who find in them an unrivaled way of seeing the country through which they pass and of being relieved of the inconveniences of attending to baggage and of engaging hotel accommodations for the night. These details are cared for by the conductor of the tour.

With these tours also, maps of the trips available form an important part of the traffic literature. Thus the circular descriptive of the motor tours in Great Britain offered by Thomas Cook & Son in 1927 contained fourteen separate maps and the same number of individual maps is found in their corresponding pamphlet on "How to See the Riviera" by motor bus. When concerns with the long experience in traffic solicitation of Cook & Son place so much emphasis on the map as a factor in traffic promotion there must be something in the idea.

At this passenger waiting station of the London County Council persons can learn what car to take to a desired destination by pressing a button

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Ten storage-battery tractors pay big dividends in the Coney Island shops of the Brooklyn-Manhattan Transit Corporation

Better Maintenance Equipment

INSURES BETTER SERVICE

The need for modernization is not limited to cars, track and line. Substitution of machine work for hand labor in maintenance produces higher standards and economies that may be utilized to build revenue

BY

CLARENCE W. SQUIER
Associate Editor ELECTRIC RAILWAY JOURNAL

CUSTOMERS of electric railways must be pleased. Service is the first consideration, and to give good service improved tools must be used by all departments. That means modernization of equipment, better cars and roadbeds, higher speed and greater comfort to passengers. These are the things that the public seeks. But back of it all there must be efficient methods and improved shop equipment for maintaining cars, track and line. There are many practices that are now coming into use by electric railways that are proving profitable investments in addition to insuring better service. There are many examples reported by electric railways of tools paying for themselves in from six months' to a year's time. Surely these tools can be considered profitable investments.

Electric trucks are used by many electric railways for handling all classes of shop materials economically and speedily. The properties using them find a multitude of operations to which they can be applied advantageously to reduce handling costs, increase storage space and speed up the transfer of materials. The Cleveland Railway was one of the first to use storage-battery trucks in its shops. Milwaukee followed shortly and the Third Avenue Railway, New York, has found this type of truck equipped with a lifting platform to be an attractive investment. Probably the biggest user among electric railways is the Brooklyn-Manhattan Transit Corporation with a total of sixteen electric trucks in its various shops.

A careful record was kept of the operation of the first truck used by the Milwaukee Electric Railway & Light Company. It was found that the truck displaced six men who formerly were employed in moving material from one department to another. Brooklyn reports savings that indicate that its trucks will pay for themselves in a period of $1\frac{1}{3}$ years. The cost of these trucks varies from $2,300 to $5,000 each. Four trucks purchased by one railway at a total cost of approximately $14,000 included one derrick truck, one equipped with a raising platform and two with stationary platforms. With this equipment eight men formerly engaged in handling materials were displaced. It was estimated that the saving in labor alone paid for the entire equipment in 1.3 years.

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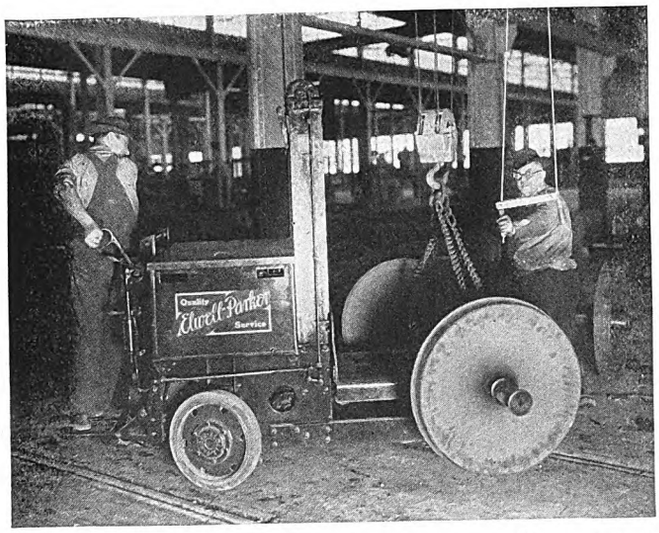


Car wheels and axles are handled in the new Winton shops of the Cincinnati Street Railway with this 400-lb. lift truck

With trucks equipped with either cranes or lifting platforms, heavy parts and materials may be handled directly to shop machines. In some instances where heavy parts are to be handled, one man with an electric truck may displace from two to four men. With the lifting platform type of truck heavy parts can be taken from under cars and raised to machines or benches or lowered to the shop floor by one man. Ordinarily this work would require from two to six men, and the time consumed would be materially greater. Considerable heavy lifting is eliminated and the accident hazard is less. The platform can be lowered to run under the axle of the smallest pony wheels or lifted high enough to pick up the largest drivers for transportation about the shop, and for lifting directly into the wheel lathe or the wheel press. Similarly, with the crane-type trucks, heavy parts like wheels or motors may be picked up, transported and placed directly in the lathe or boring machine. Some shops, lacking overhead traveling cranes, are using electric trucks as a substitute, and with a very much lower investment.

Electric trucks also are useful in lifting, transporting and placing motor shells in position for reboring, in lifting shafts, armatures and other parts into lathes for turning, and in handling heavy castings to drill presses. The use of platform boxes, dump skids and roller platform skids facilitates the handling and transporting of small parts. Materials can be kept on platforms in the storeroom racks and can be taken out as each set of parts is required. Where space is at a premium various types of skids can be piled on one another and can be arranged so that these can be removed without disturbing the load in other parts of the pile. Storerooms using these trucks find that the properly-designed racks effect large economies in storage space.

Machine Washing and Cleaning Replacing Hand Labor

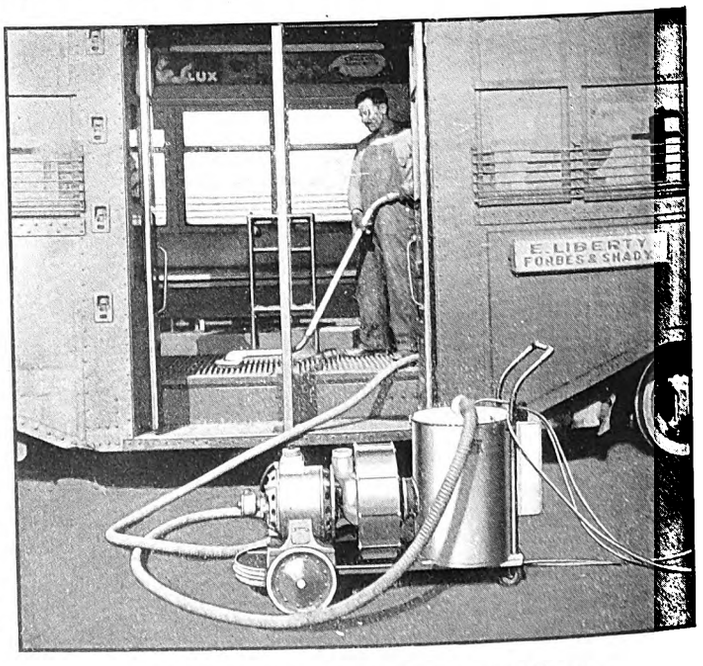
Clean cars are an important factor in keeping public good will and in attracting riders. During the past year some electric railways have materially reduced car cleaning costs by using special washing tracks and mechanical washing machines. The Pittsburgh Railways developed a mechanical car washing machine which was described in the issue of Electric Railway Journal for March 12, 1927. A monthly saving of more than $600 in the cost of car cleaning resulted from an installation which cost approximately $2,000. The mechanical washing was found to be more thorough than hand washing.

The principal advantage of the machine, however, is the reduction in time necessary to clean a single unit. This permits all of the cars to be washed more often, so that they present a better appearance. Cars are cleaned uniformly and dry without streaking or spotting. No wiping is required.

Mechanical cleaning equipment in Pittsburgh has reduced the amount of labor required to only a fraction of that needed for hand work. One man with the washing machine can keep as many as 100 cars washed on the outside under average conditions. A 50-ft. car is run through the machine in two minutes and about 100 gal. of water are used. Brushes are expected to last for 6,000 cleanings. The brush speed is about 300 r.p.m. A total of 1,400 cars are cleaned with a night and day force of 80 men, and the yearly cost is about $100,000.

Machines of this type also are being used by the St. Louis Public Service Company, the Pennsylvania Railroad and the Baltimore & Ohio Railroad, but the machine was developed primarily for washing electric railway cars. The Baltimore & Ohio Railroad installed its machine in August, 1927, and in 57 days 3,501 cars were washed. As many as 104 cars have been washed in an eight-hour day. Four men are used as a crew for this machine. Two men on one side apply a weak solution of oxalic acid with a long-handled brush to the window glass before the cars pass through the spray, and two additional men operate the water sprays and brushes. Each car is washed in an average of two minutes. Cars in trains may be passed through the machine. A seven-car train is washed in approximately fourteen minutes. This is less than one man-hour per train that formerly required 35 man-hours to clean. The railroad has reduced its washing force by six men, resulting in a saving of more than $600 monthly.

In Pittsburgh vacuum cleaners are used for cleaning car interiors. The schedule for interior cleaning interlocks with the car-washing period, which is every four days. Twenty-one heavy-duty portable vacuum cleaners



Cleaning a car of the Pittsburgh Railways with a vacuum cleaner

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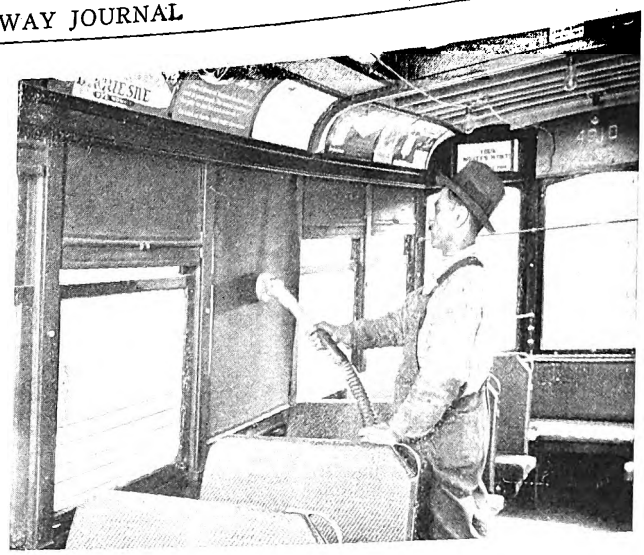
with auxiliary equipment, manufactured by the Invincible Vacuum Cleaner Company, are used. It has been found that two men with two equipments can clean satisfactorily 45 cars per day of eight hours.

Vacuum cleaners may be used for cleaning curtains, seats, floors, ceilings, inaccessible corners, inside electrical equipment and other parts of the car. The attachments used in Pittsburgh include a special floor rod with 30 ft. of 1½-in. vacuum hose, a swivel wall brush, a triangular street car tool, a round bus floor tool, a plush seat tool and a radiator tool. The average cost of one vacuum cleaner complete with necessary equipment is $555. With this equipment the Pittsburgh Railways has found it possible to keep car interiors cleaner than formerly, and at the same time to make quite an appreciable saving in the man-hours for this work. Although actual figures on the reduction in cost are not yet available, officials of the company estimate that the vacuum cleaners will pay for themselves within a period of two years.

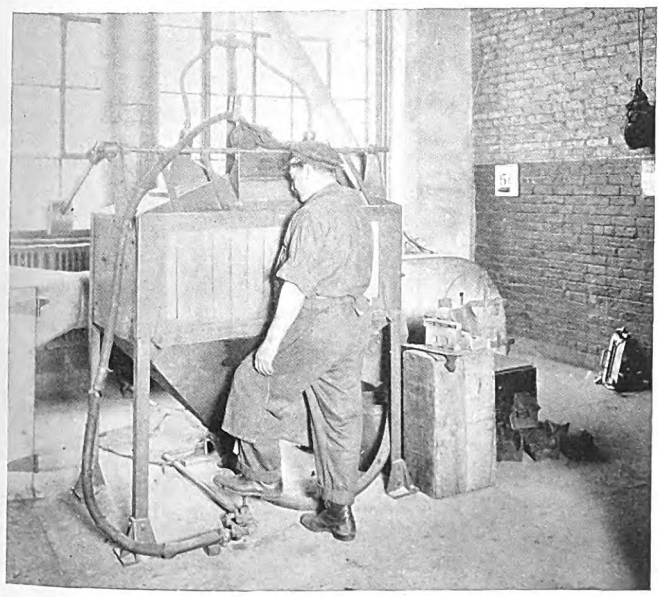


Using a vacuum cleaner and a swivel brush to remove dirt and dust from window ledges and curtains

Sandblast an Economical Cleaning Process

Sandblasts, once used by the electric railways for removing paint only, are now being used in numerous shops for cleaning various repair parts. Commercial equipment for this work can now be obtained for slightly less than $500. This includes the sandblast machine at a price of approximately $220, and a motor-driven fan with exhaust attachment at a cost of about $250. Two of these equipments have been installed in the shops of the Brooklyn-Manhattan Transit Corporation. It is reported that each machine saves the wages of three men previously employed to do the cleaning. The saving amounts to approximately $90 per week, or enough to pay for the equipment in a period of five or six weeks.

The Third Avenue Railway has cleaned various parts by sandblast for a number of years. The work is done in a room 10 ft. square by 15 ft. high, directly underneath a sand drying section. By this arrangement the cost of handling sand is reduced to a minimum. The parts are cleaned in a compartment having a window through which the blasting sand is directed. Holes below the window are provided for the operator's arms. Canvas sleeves, fastened to the steel partition, and provided with felt-lined cuffs through which the operator's hands protrude, keep the sand from blowing out into his face. The operator wears rubber gloves, which have been found more satisfactory than canvas.



This sandblast equipment, used for cleaning miscellaneous maintenance parts, paid for itself in five weeks

Controller drums, arc chutes, finger blocks, connection boards, circuit-breaker parts, brush-holders, commutators and bearings are successfully and economically cleaned by sandblasting. The economy of this method of cleaning is quite pronounced. Commutators which formerly required half a day of one man's time for cleaning, are sandblasted in approximately five minutes. Controller drums are sandblasted in about three minutes; brush-holders and bearings in about two minutes. The cleaning is much more thorough by the sandblasting method. It has been found that babbitt for bearings sticks to the sandblasted surface better than to surfaces prepared by wiping and scraping. Thick accumulations of grease are not removed readily by the sandblast. A thin coating of oil or grease, however, is removed readily and much more effectively than by wiping. To avoid damage to insulation, these parts are covered with tape. Piecework prices of the Third Avenue Railway for sandblasting give a fair idea of the cost of cleaning by this method. These are as follows: Average size commutators, 10 cents each; controller drums, 8 cents each; controller arc deflectors complete, 8 cents; controller covers, 8 cents; controller connection boards complete, 8 cents; brush-holders, 2 cents; armature bearings, 1 cent; axle bearings (two halves), 1 cent.

More Thorough Cleaning at Less Cost with Chemical Vats

Chemical cleaning of dirty and greasy metal has been found to be economical and has been used by electric railways for a number of years. Many shops provide special tanks for cleaning small parts removed from cars and trucks. Motor frames and housings, bearings, gear cases, journal boxes, compressors, brake rigging parts, etc., are cleaned quickly and economically. Several electric railways have installed tanks of sufficient size to take a complete truck frame, and particular economies are reported for this kind of work.

Trucks due for overhaul are run in next to the vat. After the gear cases and motors are removed the frames are lifted from the wheels and are dropped within easy reach of a crane used to serve the hot chemical vat. The

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whole frame is lowered into the hot solution and is allowed to remain from one to three hours. It is then transferred to the rinse stand, and washed with a hose. Since the metal has been raised to the temperature of the vat, the rinse water dries off quickly and the truck frame is turned over to the repair men, clean and perfectly dry. By inspection immediately after removal from the rinse stand, incipient cracks or fractures are easily located and repairs can be made with a portable welding outfit. When a truck is cleaned in this way as a preliminary to overhaul, a considerable saving in time occurs in making repairs and in reassembly.

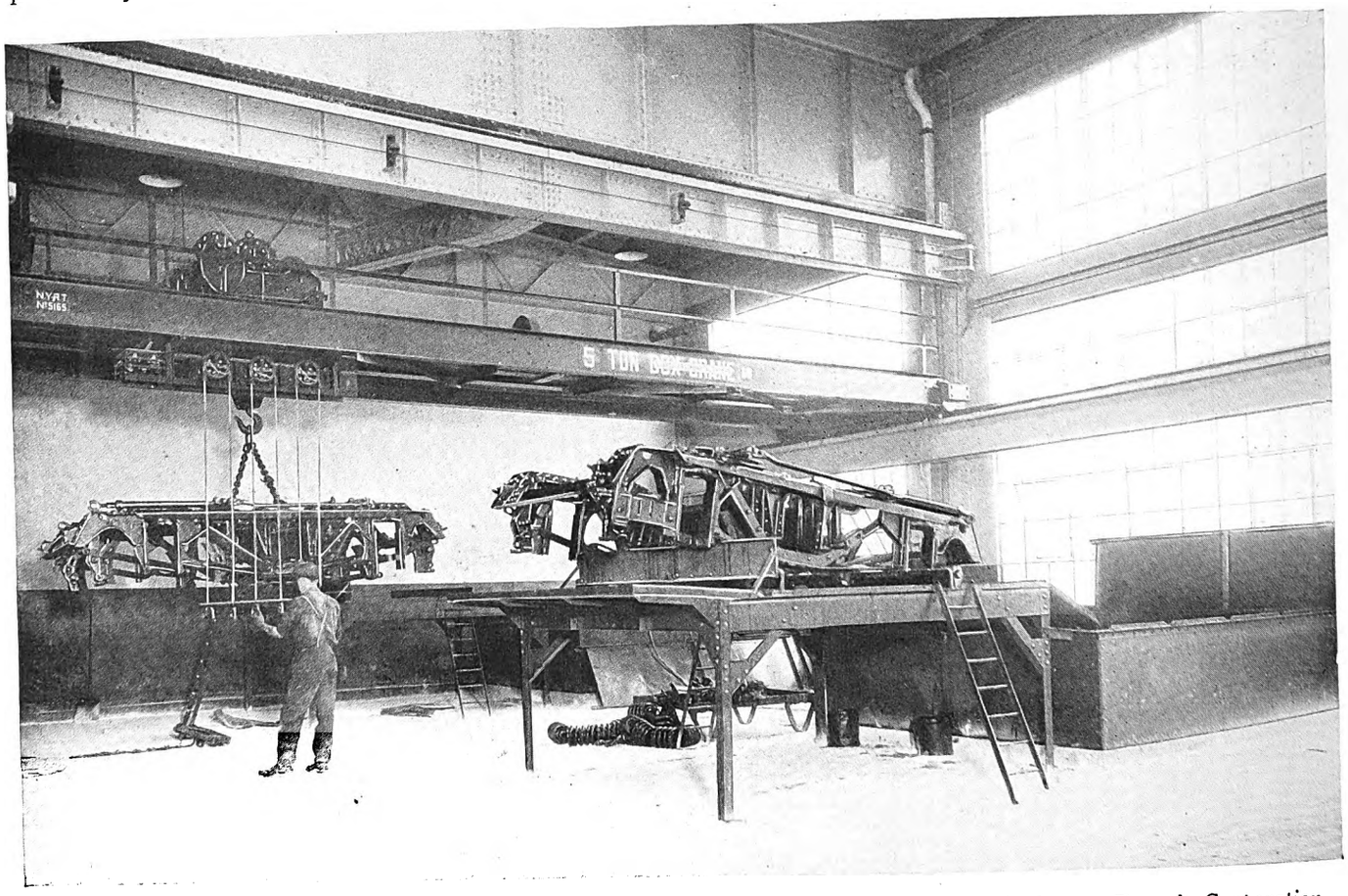
Usually the truck overhauling floor in most electric railway shops is a dirty place, but with a hot chemical vat much of the dirt and grease is eliminated. Most of it remains in the vat, from which it may be removed periodically. There are many cleaning solutions now on the market which are used quite extensively by electric railways, and manufacturers of these materials have prepared various designs of cleaning vats in several sizes.

Pot soldering of armatures, practiced by some electric railways, is another way of economizing. One road which does this work on a piecework basis reports that the former price for soldering an armature was $2.25. With the soldering pot the piecework price is 42 cents per armature, a saving of $1.83. The cost of a soldering pot equipment is about $1,100, so that on this system the soldering of 600 armatures paid for the new pot.

Another property allows 31 cents for soldering an average-sized street car armature in a soldering pot. Two men now do all the soldering, whereas twelve men were formerly engaged on this work. In this shop the armatures are suspended from a hook fastened to the pinion end so that they hang vertically with the commutator end down. A sheet metal ring over the soldering pot fits the commutator quite closely. Asbestos tape is wrapped on the commutator to within about 1 in. of the neck, to protect the surface from solder. The remaining space to the neck is painted with a mixture of whiting and alcohol to prevent the solder from adhering. While the commutator is immersed in the hot solder the neck is raked with a wire brush to insure good contact of the solder.

Modern Equipment Saves Track Construction Dollars

Track repairs and reconstruction work offer an attractive field for the use of labor-saving and material-handling equipment. The possibilities in the substitution of machine for hand labor in this class of work is illustrated by the startling contrast to yesterday's methods found in modern highway construction.



Assembled trucks are dipped in tanks of paint in the Coney Island shops of the Brooklyn-Manhattan Transit Corporation and are placed on the drain racks to dry

Many electric railways have made considerable progress in getting more value for their track dollars. The Denver Tramway Corporation mixes concrete aggregate in material yards provided with mechanical conveyors and elevators which take materials from pits under hopper-bottom gondola freight cars to elevated storage, from which it is dropped directly into narrow-gage batch cars of the end-dump type, carried on flat cars. Narrow-gage tracks on the flat cars permit the batch cars to be dumped directly into the mixer at the job. The time of only three men is chargeable against the handling of the concrete.

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The pot method of soldering armatures has proved a time and money saver where there is sufficient volume of work

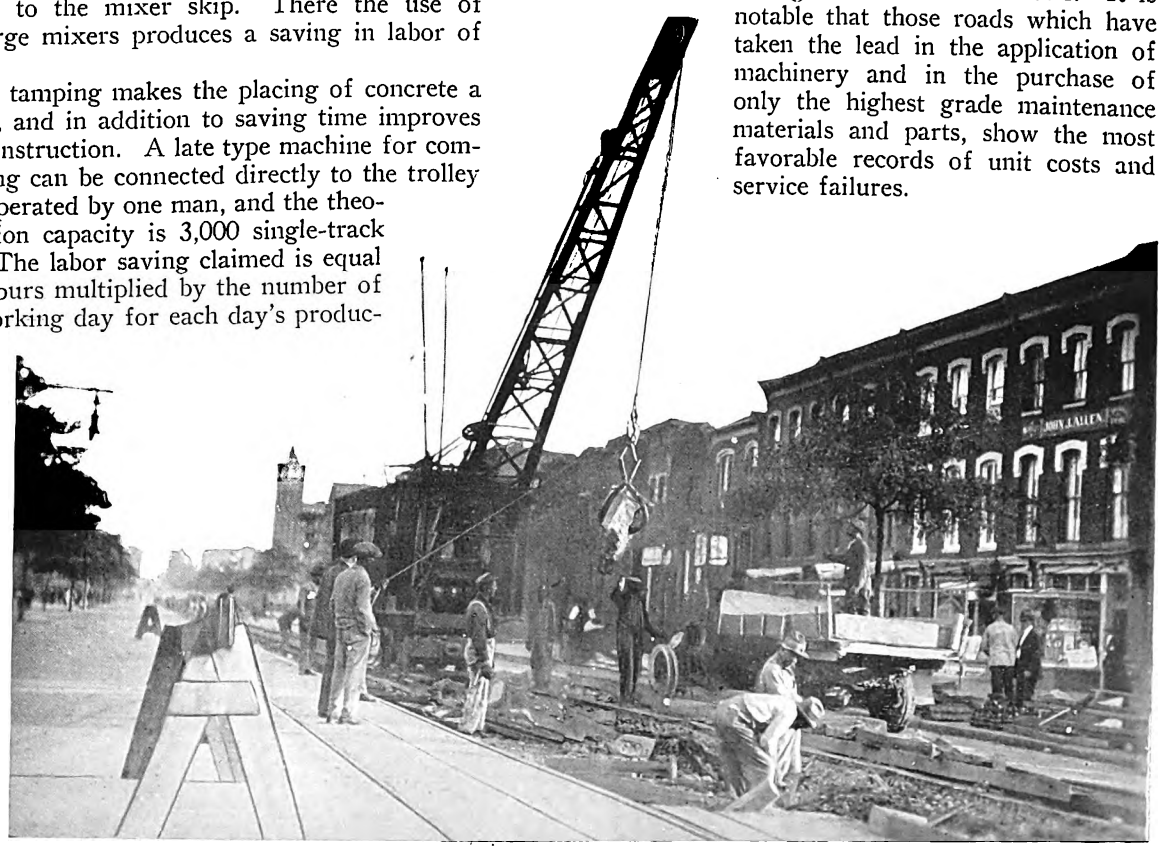
A modification of this method is used in Kansas City. In that city Differential dump cars are used to get the material out to the street, where it is handled by Haiss batch-bin type elevating loaders and light dump-body trucks directly to the mixer skip. There the use of loaders and large mixers produces a saving in labor of 51 per cent.

Compression tamping makes the placing of concrete a mechanical job, and in addition to saving time improves the resulting construction. A late type machine for compression tamping can be connected directly to the trolley circuit. It is operated by one man, and the theoretical production capacity is 3,000 single-track feet per day. The labor saving claimed is equal to three man-hours multiplied by the number of hours in the working day for each day's production. The use of pneumatic and electric tampers is so general that it may seem unnecessary to point out their advantages for tamping stone ballast in paved streets, yet many properties still use the hand pick and tamping bar method.

Safety alone dictates the use of mechanical equipment for handling rail, but in addition to safety large labor savings are possible on extensive work. Mechanical handling permits the setting of the rail in close alignment and approximately to surface, reducing the subsequent labor. Removal of old track and excavations for new construction offer similar opportunities for labor saving. Many improved devices have shown startling economies as compared with hand work. For instance, on one job concrete breakers used on old 6-in. concrete paving foundation, for one-half the devil strip between the rails of standard gage track and 1 ft. outside the rails, broke 45.8 single-track feet per man-hour. Hand methods with picks, shovels, chisels and sledges broke 3.48 single-track feet per man-hour.

Grinding rail corrugations and joints after repairs form a considerable item of track maintenance for most electric railways. Recently the United Railways & Electric Company of Baltimore developed a special car equipped with reciprocating grinders for this work, and during the first six months of 1928 as much rail was ground as was covered formerly in a year. The average cost per foot of rail for the work is about one-third of the cost of grinding by the former method. The car actually paid for itself the first six months it was in service.

Thus in practically every phase of electric railway maintenance pracitce there are opportunities for improving results and saving cost by the substitution of machine for hand labor. This subject is only beginning to receive the attention which its importance warrants. The experience on these properties which have invested in better maintenance equipment indicates that surprising savings can be made in costs. It is notable that those roads which have taken the lead in the application of machinery and in the purchase of only the highest grade maintenance materials and parts, show the most favorable records of unit costs and service failures.



In Washington, D. C., track construction equipment saves time and money during track reconstruction

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News *of the* Industry

Private Right-of-Way Through East Chicago

Removal of the right-of-way of the Chicago, South Shore & South Bend Railroad in the city of East Chicago, Ind., from its present location in Chicago Avenue to a new private right-of-way paralleling the Grand Calumet River about 1 mile to the south will begin on Sept. 1, it was announced on Aug. 27 by Charles W. Chase, vice-president.

Agitation for the removal of the company's double-track line from the city's principal throughfare was initiated by East Chicago citizens about two years ago when the city decided to widen and repave the street. In the spring of 1927, the company, accordingly, purchased a 150-ft. right-of-way approximately 3¾ miles long, extending from Kline Avenue and the Calumet River in the northeast corner of Hammond, through the south portion of East Chicago, to a point near the intersection of Columbia and Chicago Avenues in Hammond.

In the meantime, city officials of East Chicago, fearing that the South Shore Line's service would be entirely lost to the community, undertook to obtain for the company an easement over the private right-of-way of the Baltimore & Ohio Railroad, which also operates through the downtown section of the city.

The city having failed in these negotiations to retain the operation of passenger trains through the central district, and being unwilling to meet certain other conditions imposed by the company, the South Shore Line tracks are to be removed immediately to the new location.

In commenting upon the company's action, Mr. Chase said:

It is absolutely necessary for us to get off Chicago Avenue, for our tracks there are in poor condition and need replacements and our freight traffic is becoming too heavy for speedy transfer through the heart of East Chicago's business district, where numerous traffic lights and railroad crossings delay our schedules.

Construction of the new right-of-way, which will be completed before the end of the year, involves the laying of double tracks, overhead wires and the erection of a new passenger station for East Chicago patrons. Three tentative sites for the station are now under consideration by officials of the company. The company proposes to provide a shuttle service with buses from the downtown section of East Chicago to the new depot.

Owing to the absence of street intersections and railroad crossings on the new right-of-way passenger schedules will be reduced between four and five minutes over the present schedules in the city streets, and a proportionate saving will be made in the running time of freight trains, Mr. Chase declared.

Wage Increase in Lynchburg

The Lynchburg Traction & Light Company, Lynchburg, Va., announced a 5 per cent raise in pay for motorman and conductors effective on Sept. 1. On Sept. 3 the company put into effect an increased fare. The fare was 5 cents, but the new rate goes to 7 cents, or four tokens for 25 cents.

Weekly Pass Popular in Roanoke

More than 2,500 weekly passes were sold by the Roanoke Railway & Electric Company, Roanoke, Va., and the Safety Motor Transit Corporation lines for the first week's operation under an increased street car fare there.

COMING MEETINGS OF *Electric Railway and Allied Associations*

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

***Sept. 25*—Central Electric Railway Master Mechanics' Association, Cleveland, Ohio.**

***Oct. 1-5*—National Safety Council, safety congress, New York, N. Y.**

***Oct. 8-12*—American Welding Society, fall meeting, Philadelphia, Pa.**

***Oct. 24-25*—Public Utilities Association of West Virginia, annual meeting, Huntington, W. Va.**

***Nov. 7-8*—Iowa Electric Railway Association, operating meeting, Roosevelt Hotel, Cedar Rapids, Iowa.**

***Nov. 21-22*—Public Utilities Association of Virginia, Hotel Roanoke, Roanoke, Va.**

***Jan. 14-18, 1929*—American Road Builders' Association, convention and road show, Cleveland, Ohio.**

***Jan. 23-25, 1929*—Electric Railway Association of Equipment Men, Southern Properties, Houston, Tex.**

Franchise Changes Suggested in Tacoma

Mayor M. G. Tennant and Tacoma interests represented by Samuel M. Jackson concur in the plan to solve the Tacoma railway problem by granting a new franchise to a local company, which would take over the Tacoma Railway & Power Company and certain intertied property, writing out of the books a large part of the present valuation for rate-making purposes, and spending $500,000 for rehabilitation.

Attorney Scott A. Henderson, receiver for the Puget Sound Electric Company, is ready to co-operate to bring about the new financial set-up. In a letter to the Mayor he reviewed at some length the events which have transpired since the first of this year, when, after it became apparent that the City Council was going to stand back of the findings of the report of its statistical engineer, Kenneth Harlan, and insist upon elimination of intangible values considered to be excessive, it became likely the local companies would go into the hands of a receiver. The statement made by Mayor Tennant last January when he met with representatives of the bondholders of the Puget Sound Electric Company and of Stone & Webster, Inc., in New York, made possible the approach to a solution through the means now offered, in an opinion expressed by Mr. Henderson.

A Tacoma company should own not only the properties of the Tacoma Railway & Power Company, but also those of the Pacific Traction Company, which operates the American Lake and Steilacoom lines, and certain properties of the Puget Sound Electric Railway, operating the interurban line, it is declared.

The Puget Sound Electric properties are valued at $370,000 according to Attorney Henderson; those of the Tacoma Railway & Power Company at $6,352,250 and those of the Pacific Traction Company at $607,885, making a total value of $7,330,135, which the local interests would buy in. If properties could be secured by the new company at approximately 50 per cent of their book value, that value could be taken for a new rate base.

As the Puget Sound Electric Railway is the owner of all the capital stock of the Tacoma Railway & Power Company and the Pacific Traction Company, Attorney Henderson as receiver for the Puget Sound Electric Company is believed to be in a position to render very material aid to the plan. Stone & Webster control of the local companies has existed through a financial interdependence that comes down through the Puget Sound Power & Light Company, which owns the capital stock of the

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Puget Sound Electric Railway. The entire matter of the relations of the companies with the city will be considered in a full meeting of the Council at the earliest possible date.

$87,000,000 Subway Opened in Philadelphia

With former Mayor W. Freeland Kendrick at the control lever, the first train officially to traverse the new $87,000,000 North Broad Street subway in Philadelphia pulled slowly out of the City Hall station on Sept. 1 and 23 minutes later arrived at the Olney Avenue terminal yards, 6 miles northward.

Seven-car trains were run throughout the day, carrying about 20,000 passengers to whom had been issued complimentary tickets for the first day's operation of the tube. The following morning the subway went into public operation.

Before Mr. Kendrick operated the first train in the subway, the construction of which was started in the first year of his Administration four years ago, brief ceremonies were held on Reyburn Plaza, near the subway entrance at City Hall.

Mayor Mackey paid tribute to the Kendrick Administration and regretted that the exercises could not have taken place before his predecessor left office.

Mr. Kendrick said he regarded the Broad Street subway as the foremost achievement of his administration.

The subway has four tracks, but only the local tracks will be used, it is expected, until the South Broad Street section between City Hall and South Street is ready for service, due to the congested condition in the loop around City Hall.

The tube will be operated by the Philadelphia Rapid Transit Company for a rental of $200,000 a month, over a contractual period of three months. At the end of that time sufficient data are expected upon which a permanent contract can be based. A commission will check these data to determine the basis for the new agreement.

A 7½-cent fare will be charged, but no free transfers or exchanges will be issued south of Spring Garden Street.

Decision Deferred in Baltimore Fare Case

A plea of the Maryland Public Service Commission for a stay from a decision of the Maryland Court of Appeals remanding the fare case of the United Railways & Electric Company, Baltimore, to the commission on a point involving the depreciation allowance issue, was heard on Aug. 30 by Justice Brandeis of the United States Supreme Court. Justice Brandeis expressed doubt that either side had the right under the circumstances to appeal to the United States Supreme Court and he deferred his decision on the petition filed by the commission pending an appeal to the Supreme Court on a writ of certiorari, until Sept. 11 or 12, when counsel for the commission was requested to file a brief to show that the Court of Appeals decision was not final.

"Car Financing" Luncheon on Thursday

SO THAT two subjects so closely allied as "Car Financing" and "New Cars," originally scheduled for the Round Table Luncheon Conference at the Hollenden Hotel at Cleveland on Wednesday, Sept. 26, shall not be discussed on the same day at the same time, the "Car Financing" luncheon has been put over on the program until Thursday at the same hour and the same place.

J. V. Sullivan a World's Fair Chairman

Joseph V. Sullivan, assistant to the vice-president of the Chicago Surface Lines, has been appointed World's Fair chairman for the public utilities industry to assist in furthering the enrollment campaign. Mr. Sullivan was selected for this work by Col. Stuyvesant Peabody, millionaire sportsman and head of the campaign, because of his long experience in the public utilities field.

After accepting his appointment, Mr. Sullivan immediately asked a number of men prominent in the Public Utility group to serve on a committee with him for the World's Fair. Those signifying their willingness to do so are: John G. Learned, vice-president of the Public Service Company of Illinois; H. M. Lytle, vice-president of the Chicago Rapid Transit Company; George B. Foster of the Commonwealth Edison Company; Herbert Brown, city superintendent of the Western Union Telegraph Company; B. J. Mullaney, vice-president of the Peoples' Gas, Light & Coke Company; Charles M. Wheeler, of the Illinois Power & Light Corporation; and A. E. Pierce, president of the Central Public Utilities Company; and G. T. Seeley, vice-president of the Chicago Motor Coach Company. Each one expresses the opinion that a 100 per cent enrollment will be achieved by various public utilities concerns, as public sentiment seems almost unanimous for the centennial. Mr. Sullivan said:

The purpose of carrying on this enrollment drive is to demonstrate the interest of Chicago people in a big celebration. With Chicagoans standing firmly for World's Fair, as they did for the Columbian Exposition of 1893, its success is assured.

Mr. Sullivan went on to say that the deferred payment plan originated by Col. Peabody is proving very effective in enrolling men and women employed. By it, a person may sign a pledge and agree to have the sum of 50 cents deducted from his salary each week for ten weeks, or until the $5 for a World's Fair membership has been paid in full. Already numerous firms have adopted this idea and have turned in a 100 per cent enrollment. In conclusion Mr. Sullivan said:

Chicago is now the center of transportation and commerce of the world and I believe firmly that the 1933 Centennial will go a long way toward making it the world's first city, instead of the third.

Storm Hits Minneapolis

For the first time in the history of the Twin City Rapid Transit Company, Minneapolis, Minn., the whole system went dead recently, for five hours, beginning at 4:45 p.m., when the peak load is almost reached. Meanwhile 1.44 in. of rain fell.

Lightning struck a cable near the transforming station at the headquarters building, Eleventh Street and Hennepin Avenue. It destroyed the telephone connections, burned 25 out of 26 2-in. cables, exploded a manhole cover 15 ft. into the air and started a fire in the tunnel which burned for an hour. The gas kept the repair crew out of the tunnel for another hour. It was necessary to cut off all power. T. Julian McGill, vice-president said:

Two hours after the lightning struck, service was installed on a few lines outside the loop, but it was nearly 9:30 before cars were operating again in the loop district. It was the worst tie-up due to a rainstorm the company has experienced in its entire history.

Owing to the rain and the time of day, buses and motor facilities were entirely inadequate to handle the traffic.

Paving Question Raised in Hammond

A petition asking that the franchise granted to the Hammond, Whiting & East Chicago Railway for operation of cars on the streets of Hammond, Ind., be revoked because of alleged failure to comply with the terms of its charter has been filed with the Public Service Commission of Indiana by Gerald Gillette, city attorney of Hammond.

According to Mayor Adrian Tinkham the city's complaint to the commission is based on the fact that the railway has refused to raise the level of the tracks on Hohman Street between Hoffman and Gostline Streets. He explained that Hohman has been paved early this year and was ready for opening to traffic in July, except for that portion of the street between the car tracks between Hoffman and Gostline Streets. Although required by its ordinance to improve its right-of-way to conform to public improvements the company has consistently refused in this case to raise the tracks 3 in. to permit completion of the paving and as a result it has been necessary to close the new road to traffic, the Mayor declared.

Counsel for the railway gave lack of funds as the reason for the company's failure to co-operate with the city and

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attributed the company's present financial condition partly to the fact that in 1924 the city had granted to the Calumet Motor Coach Company the exclusive right to operate buses on the streets of Hammond, thereby seriously affecting the railway's revenue and causing it to operate at a loss. The petition filed by the city will be opposed by the company.

Boston Tunnel Line Extended

Another new section of the Boston rapid transit system was opened to the public on Sept. 1. It extends the Dorchester tunnel line to Peabody Square, and has two stations a little more than a mile apart. Shawmut is a by station, and Ashmont is the new terminal station where five lines of transportation converge. This new section covers an area of about 5 acres and for the present will accommodate four-car trains on a two-minute headway schedule during rush hours, and two-car trains during the ordinary traffic hours of the day. The platforms are long enough to handle six-car trains. One more section will complete this line. It will carry to Mattapan Square and establish rapid transit between Harvard Square, in Cambridge, to Mattapan on the opposite side of Boston. Like most of the other rapid transit lines in Boston it is financed and built by the city of Boston and leased and operated by the Boston Elevated Railway.

Inquiry Into St. Louis Fares

Under a ruling written by Commissioner John H. Porter the Missouri Public Service Commission on Aug. 30 ordered a general investigation of the rate zoning system in effect on the lines of the St. Louis Public Service Company in St. Louis and St. Louis County. This investigation will determine the reasonableness of the present arrangement and the likelihood of any discrimination in favor of certain sections of St. Louis County. The check up will also include the lines of the Missouri Electric Company operating between Wellston and St. Charles.

The ruling has the effect of consolidating a number of complaints concerning fares charged in St. Louis County. Both the company and the city of St. Louis has opposed any extension of the one-zone fare system to other parts of St. Louis County and have also asked that the commission revoke the concession previously granted to the University-Olive line.

Stops in Baltimore Approved

The United Railways & Electric Company, Baltimore, Md., has abandoned certain stops in the downtown section of the city as a means of speeding up traffic. The changes have been made at the request of the Police Department and have the approval of the Maryland Public Service Commission.

Recent Bus Developments

Galveston-Houston Service Started

Bus service between Galveston and Houston and intermediate points in Texas was started by the Texas Bus Lines, Inc., controlled by the Galveston Electric Company, on Aug. 15. The one-way fare is $1.75 and the round trip fare is $3. A daily schedule is maintained, buses leaving Galveston at 9 and 11 in the morning and at 3 and 7 in the afternoon. Buses leave Houston at 9 and 11 a.m. and 1 and 5 p.m., arriving at Galveston in one hour and forty-six minutes. R. G. Carroll is manager of the bus lines.

Milford Company Switches to Motor Coaches

Drums sounded and trumpets blared nearly 40 years ago when the power was turned on for the Milford, Framingham, Hopedale & Uxbridge Street Railway, a reception in contrast to the operation of the last trolley and the start of motor coach service on Sept. 1. The change carried out a plan adopted when the Milford & Uxbridge Street Railway was reorganized about a year ago. Three distinct cycles are to be noted in the development of transportation in the Massachusetts towns served since the old stage coaches were abandoned. The present rails were originally used by steam trains. Later trolley cars replaced them and now motor coaches replace the trolley cars.

The new motor coach service will supplant everything except two runs of trolley cars from Milford to Hopedale to accommodate workers in a manufacturing plant in Hopedale.

Walter L. Adams, superintendent, sees advancement and better financial prospects in the operation of motor coaches exclusively.

Expansion Continues in St. Louis Territory

A state permit has been issued by the Missouri Public Service Commission to the St. Louis-Alton Bus Company to operate a line of buses between St. Louis, Mo., and Alton, Ill., via two highway bridges spanning the Missouri River and the Mississippi River recently thrown open to traffic. This line will reduce the distance between Alton and St. Louis and will take passengers into the downtown section of St. Louis by a direct route.

The commission also authorized the Alton Railway to operate into St. Louis over the McKinley Bridge as an interstate motor carrier. The St. Louis terminus will be the Eads Bridge passenger station at Third Street and Washington Avenue, St. Louis. This company on Aug. 28 applied to the Illinois Commerce Commission at Springfield, Ill., for permission to discontinue its Brooklyn-Venice line between East St. Louis, Ill., and North Venice, Ill., and substitute buses.

On that date the Illinois commission denied a rehearing on the Illinois Traction System's petition to operate a bus line between East St. Louis, Ill., and Chicago, Ill.

Substitution in Greenville

W. B. Ellis, Jr., of the Southern Public Utilities Company, recently announced the schedule of buses to operate as far out Augusta Street at Greenville, S. C., as the first entrance to the Country Club. This service is being installed under permission granted by the South Carolina Railroad Commission to discontinue the Augusta Street trolley line.

Special Service Provided by Los Angeles Railway

A certificate of public convenience and necessity has been granted the Los Angeles Railway Corporation to operate auto passenger service between Inglewood and Mines Field, Cal. This service will be operated only on Saturdays, Sundays and holidays occurring when Mines Field is the scene of such special events as will require the operation of the service proposed to meet traffic demands.

Substitution of Bus Service Justified

The California Railroad Commission has reaffirmed its previous order, dated July 3, 1928, authorizing the Pacific Electric Railway, Los Angeles, to discontinue operation of electric railway service between Upland and Ontario in San Bernardino County, and to substitute motor coach service as a matter of operating economy.

Certain objections having been made to the commission against its action of July 3, the matter was reopened and hearings were conducted by Examiner Ira H. Rowell at Ontario. It was shown upon the reopening of the matter that the municipal authorities of both cities still favored the application of the company. Pacific Electric showed that it had operated the railway service at a loss of $3,869 during the year ended March 31, 1928, and that substitution of motor coach service would result in an annual saving of $9,600 a year. Upon such showing the commission has reaffirmed its previous action authorizing abandonment of railway service.

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Financial *and* Corporate

Railway at Fort Smith to Be Segregated

Stockholders of the Fort Smith Light & Traction Company, Fort Smith, Ark., on Sept. 4 approved the sale of the company's electric and railway properties and its interest in the Mississippi Valley Power Company, a subsidiary, to the Standard Gas & Electric Company. The Standard company plans to operate the electric and the railway divisions as separate companies in the future. The electric properties will be operated by the Mississippi Valley Power Company, while the railway system will be operated by the Fort Smith Traction Company, a separate organization.

The principal reason given for this change is that no financing of the company has been possible on account of the poor earnings showing of the railway department of the old company. It is believed by Standard officials that the new arrangement will prove beneficial in this respect. A program of construction and expansion has already been outlined, the principal item of which will be the construction of an additional transmission line from Fort Smith to Ozark. An expenditure of $225,000 has been authorized for this purpose and materials ordered.

Accounting of New York Railways to Be Heard

Special meetings of stockholders of the Sixth Avenue Railroad, 42nd Street and Grand Street Ferry Railroad, 23rd Street Railway, 34th Street Crosstown Railway, Christopher & Tenth Street Railway and Bleecker Street & Fulton Ferry Railroad have been called for Sept. 14. Meetings are to accept the account of Hugh J. Sheeran as receiver of the New York Railways, filed on July 11, 1928, with the special master in the action known as the General Accounting Action, showing the allocation of the earnings of the receivership period; and to authorize an operating agreement between the respective companies and the New York Railways, to be dated as of Jan. 1, 1928, providing for operation of the property.

Commission Approves New Indiana Interurban Set Up

Formal approval of the transaction by which the Indianapolis & Southeastern Railroad headed by Charles T. De Hore, Indianapolis, takes over the old Indianapolis & Cincinnati Traction Company, has been given by the Indiana Public Service Commission. A certificate was granted the new company and it was authorized to issue approximately $1,700,000 in securities to finance the transaction. The actual change in management was made some time ago subject to the approval of the commission, when Mr. De Hore and others purchased the property at a receiver's sale at Rushville, Ind., for about $500,000.

In the order, the new company is authorized to issue $1,000,000 of 6 per cent, 25-year mortgage bonds at par, and 10,000 shares of common stock of no par value, shares of which are to be sold at $70. It was pointed out that in addition to the $500,000 price paid at the receiver's sale, a group of Car Trust Equipment Company property was bought for $325,000 and $25,000 was paid in for working capital. According to the order evidence showed new rolling stock valued at $185,000 comprising ten new interurban cars, now in operation. The commission, on a basis of taxable valuation of 80 per cent, found the fair value of the property to be $2,000,000.

Traffic, Fare and Wage Figures

The number of revenue passengers, including bus passengers, reported by 220 companies to the American Electric Railway Association for July, 1928, compared with July, 1927, is as follows:

July, 1928	751,882,742
July, 1927	756,382,549
Decrease, per cent	0.60

The variation in the percentage decrease from the corresponding month of the previous year is very slight; in fact, in this respect traffic has been quite constant, there being a decrease of approximately 0.50 per cent each month this year from the corresponding month of the previous year. The slightly greater decrease shown for the month of July can be accounted for probably by the fact that there were only four Saturdays in July, 1928, wheras there were five in July, 1927. Saturday is, of course, the day of heaviest traffic on street railway lines.

Average cash fares in cities of 25,000 population and over were:

	Cents
Aug. 1, 1928	8.1883
July 1, 1928	8.1728
Aug. 1, 1927	8.0333

The increase in the average fare was produced by an increase in Harrisburg, Pa., from 6 cents to 7 cents, an increase in Sacramento, Cal., from 5 cents to 7 cents, and an increase in Stockton, Cal., from 6 cents to 7 cents.

The average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track are:

	Average Hourly Rate Cents	Index Number 1913 = 100 Per Cent
Aug. 1, 1928	57.48	210.94
July 1, 1928	57.48	210.94
Aug. 1, 1927	57.24	210.06

Common Dividend Passed by Twin City Company

Continued decline in revenue passengers carried may result in a petition by the Twin City Rapid Transit Company, Minneapolis, Minn., for an increase in the rate of fare, now 8 cents cash with six tokens for 40 cents. This fact transpires in connection with the decision of the board of directors to pass the present common stock quarterly dividend of 1 per cent. President Horace Lowry issued the following statement:

The Twin City Rapid Transit Company did not earn for the third quarter of this year a dividend on the common stock, and, therefore, in line with long established precedent, the directors passed this quarterly dividend.

The dividends paid on the common stock this year have totaled 2 per cent. Future dividends will be paid from time to time as net profits may warrant.

There has been a continuing decrease in passengers hauled since 1920, although the percentage reduction for this year, we are gratified to note, is less than former years.

The policy of the company in this period of decrease in passengers hauled has been to keep up to the highest operating standards all of its properties, and, therefore, while operating expenses have been markedly reduced since 1920, the condition of the property has been thoroughly maintained.

Except in a few instances where local conditions have been unusual, all of the street railways in the country have had a marked decrease in passengers hauled due to the competition of the privately owned automobile. Finally, parking problems and street congestion will control the number of private automobiles that can be used where the street cars would offer a similar service.

In this period there has been an increase in street car fares throughout the country. It is an obvious fact that there must be a substantial increase in the number of revenue passengers carried by this property, or an increased fare must ensue.

We feel optimistic about the future of the property, due to the constant and healthy growth of the Twin Cities.

For the first quarter of 1928 the gross was about $40,000 higher, but higher fixed charges made the net almost 12 per cent under 1927. For the first six months of 1928 the entire system showed a decrease of $170,000 in net income compared with 1927.

The St. Paul City Railway has a petition before the commission for an increase of fare in that city, which it has not pressed, having in April come to an agreement with the City Council on a program for paving between the tracks, calling for an expenditure of $1,000,000 in four years. Twice the voters have rejected charter amendments permitting the Council to relieve the railway of charges for cleaning the streets, paving, and sprinkling.

The usual 1¾ per cent dividend on the preferred stock was declared.

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Dallas Company a Consistent Earner

The statement of earnings of the Dallas Railway & Terminal Company, which operates the electric railway service in Dallas and vicinity and owns and operates a modern terminal station and eight-story office building near the center of the business district of Dallas, as contained in the report of the Electric Power & Light Corporation and subsidiaries for 1927 follows:

EARNINGS OF DALLAS RAILWAY & TERMINAL COMPANY FOR THE YEAR ENDED DEC. 31, 1927

	1927	1926	1925	1924
Gross earnings from operation	$3,261,004	$3,454,409	$3,429,298	$3,322,215
Operating expenses, including taxes	2,434,900	2,639,259	2,578,079	2,547,246
Net earnings from operation	$826,104	$815,150	$851,219	$774,969
Interest on bonds	300,000	277,491	267,421	267,546
Other interest and deductions	25,471	72,898	73,688	62,261
Balance	$500,633	$464,761	$510,110	$445,162
Dividends on preferred stock	105,000	46,472	35,000	35,000
Balance	$395,633	$418,289	$475,110	$410,162
Renewal and replacement reserve	178,452	185,819	267,520	186,639
Balance	$217,181	$232,470	$207,590	$223,523

Statistics of passengers carried, and other operating data at Dallas follow:

	1927	1926	1925
Population served	235,000	235,000	230,000
Passengers carried during twelve months	58,604,913	62,962,307	64,242,643
Car-miles	9,875,016	9,872,698	9,433,677
Car-hours	1,032,110	1,058,884	1,005,138
Average number of cars operated	127	134	124
Miles of electric railway (single track equivalent)	118	115	114

Hearing on St. Louis Application Sept. 14

The Missouri Public Service Commission has set Sept. 14 to hear the application of the City Utilities Company for authority to acquire and hold more than 10 per cent of the capital stock of the St. Louis Public Service Company, St. Louis, Mo. The City Utilities Company, a holding corporation, was formed for the purpose of aiding the financing of the St. Louis railway system. Several months ago the application was filed. Judge J. S. Priest representing minority stockholders of the St. Louis Public Service Company, has opposed the application.

Ottawa Company Said to Be Doing Well Under Increase

Resumption of dividends by the Ottawa Traction Company, Ltd., Ottawa, Ont., is expected to occur early in the coming year. It will be recalled that in March dividends, which for a long while had been on a 4 per cent basis for the year, with an annual bonus of 1 per cent, were suspended owing to the exhaustion of the reserve fund used in this connection over the four previous years. On this account it was necessary to suspend payment of dividends until the earnings of the company should prove sufficient to warrant payments once more. Since the fare increase which went into effect on Aug. 13 riding has held up so well that dividend talk has been revived.

Receiver for Jersey Shore Line

The Atlantic & Suburban Railway, Atlantic City, N. J., founded in 1903, the first electric line across the meadows to the mainland, has gone into the hands of a receiver. The federal court on Aug. 31 announced that creditors of the company have until Oct. 2 to file claims. The trolley line, a single-track one, runs from Atlantic City to Absecon and Somers Point, paralleling the Shore Fast Line tracks. The assets of the company are about $100,000, and liabilities nearly $500,000.

Vote Scheduled on Public Control in Boston

Stockholders of the Eastern Massachusetts Street Railway will hold a special meeting in Boston, Mass., on Sept. 11 for the purpose of voting to accept or reject the new legislative statute continuing the public control of the railway five years more. If they vote to reject the act the road will return to the direct control of the owners on Jan. 15, 1929. There is a large block of opposition stock which continues the fight against continued public control, and will carry the fight into the stockholders' meeting; it is led by L. Sherman Adams, Boston.

Discontinuance at Chattanooga Approved

The State Railroad & Public Utilities Commission of Tennessee has approved the petition of the Chattanooga Traction Company to remove its tracks on the Red Bank division in order that the municipality of Red Bank may establish a park on the right-of-way of the transportation company. The traction company was granted the privilege recently of withdrawing its passenger service to Red Bank but continued freight service, which will also be discontinued with the establishment of the park. No protests were filed against the discontinuation of the freight service on the short line between the junction and Red Bank 1 mile away.

BOOK REVIEWS

Fundamental Principles of Electric and Magnetic Circuits

By Fred Alan Fish, professor electrical engineering department, Iowa State College. Published by McGraw-Hill Book Company, New York, N. Y, 212 pages. Price, $3.

This new record edition is a revision on the fundamental principles of electric and magnetic circuits. The book is intended as an introduction to the study of electric power machinery and transmission. It covers electromagnetism, electrostatic, non-harmonic waves and polyphase currents.

The Engineers

Published by Neo-Techni Research Corporation, New York, N. Y. 1,600 pages. Price, $25.

This combined directory is a compilation by authorities on engineering corporations, the products they manufacture, engineering personnel and technical information pertaining to mechanical, civil, electrical and metallurgical engineering. It lists more than 220,000 individual engineers representing the executive and buying staff of more than 38,000 different corporations.

Der Eisenbahn Electrotechniker—Part 1

By Ministerialrat A. D. W. Wechmann. Published by Verkehrswissenschaftlichen Lehrmittelgesellschaft der Deutschen Reichsbahn, Berlin. 46 pages. Price, 4 marks.

With the increased amount of track belonging to the German State Railway being changed to electric power, the management decided there should be a series of textbooks on electrical phenomena for the rank and file. These books are primers, and are accompanied by questions and problems to assist the student as he proceeds with the book. The present volume, on the elements of applied electrical engineering, is now in its second edition. Others by the same author include volumes on the power station, railway distribution system, alternating current electric locomotives, direct current electric locomotives, electric railway repair shops, etc. It is significant that the author of this series holds a high post in the engineering department of the State Railways.

Standards Year Book 1928

Prepared by the National Bureau of Standards, Department of Commerce, Washington, D. C. 400 pages. Price $1.

In addition to informing the manufacturer of the current standardization movements affecting his industry, this yearbook is a résumé of the standardization work of scientific and technical societies and trade associations. It stresses the international aspects and activities of standardization and also gives charts showing steps through which the national standards are made available to the ultimate users.

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Personal Mention

E. W. Sweezy Heads Expanding System

Young officer of Ohio road has rounded out system with $17,000,000 capitalization and $4,000,000 annual earnings

Sent to Alliance, Ohio, as general manager of the Stark Electric Railroad following its purchase by eastern capitalists three years ago, Everett W. Sweezy now heads an Ohio utilities combine with a total capital placed at $17,000,000 and gross earnings at $4,000,000 annually.

Mr. Sweezy is president of the Suburban Light & Power Company, purchased a few months ago and moved to Alliance from Cleveland. This concern with its affiliated organizations, the General Light & Power, Alliance Power and the Stark Electric Railroad, is capitalized at $5,000,000 and has annual gross earnings of more than $1,000,000.

He is president of the new Utilities Service Company, which controls telephone systems in 65 Ohio cities and towns, and ice plants in four large Ohio cities. By a deal just made at Toledo he acquired the Citizens Necessities Company of Toledo, the Schory & Schellhase Ice Company, Canton, the Ice & Fuel Company at Youngstown and the Springfield Coal & Ice Company at Springfield for $2,000,000.

The Utilities Service Company, incorporated under Ohio laws, is capitalized at $12,000,000 and has gross earnings placed at $3,000,000. Headquarters of this and other companies controlled by Mr. Sweezy and his associates will be located at Alliance.

The telephone system which has been acquired within the last six months includes the Lima Telephone Company, Ada Telephone Company, Northwestern Telephone Company at Wauseon, Napoleon Telephone Company, Delphos Telephone Company, Riverside Telephone Company at McConnellsville, Waynesfield Telephone Company, the Northeastern Telephone Company at Warren and smaller systems in more than a score of Ohio rural communities. This system links 65 cities and has more than 28,000 customers.

Mr. Sweezy, since he assumed charge of the Stark Electric at Alliance nearly three years ago, has spent large sums rehabilitating the system and installing new rolling stock. One-man cars for both local and inter-city service replaced the antique two-man cars which were being used when the line was purchased by eastern financiers.

In extending the rail service to freight customers, Mr. Sweezy has completed negotiations with the Youngstown & Ohio River Railroad for service from Salem to East Liverpool, a distance of 28 miles, which nearly equals the trackage of the Stark Electric. This agreement gives customers along the Stark Electric an outlet to the Ohio River Valley which previously was tapped only by steam freight service.

Separate Claims Work by Brooklyn City Railroad

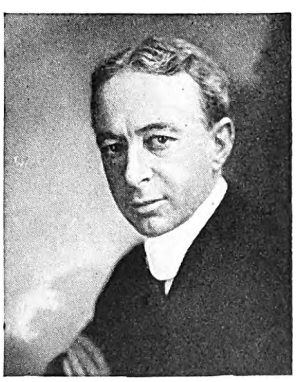
The Brooklyn City Railroad, Brooklyn, N. Y., has organized a separate unit in the claim department for the investigation and settlement, where reasonable, of claims for damages arising out of accidents on the Brooklyn City lines.

George D. Yeomans, vice-president and general counsel of the B.-M. T., and I. Isaacsen, general claim agent, will continue in charge of the claim activities of both the Brooklyn-Manhattan Transit and the Brooklyn City Railroad, as they have since the Brooklyn City Railroad resumed independent operation of its lines in October, 1919. At the head of the Brooklyn City Railroad unit and reporting to Mr. Isaacsen and Mr. Yeomans is J. J. Callaghan, whose title is chief adjuster. He has as his aide H. B. Aschoff, assistant adjuster.

OBITUARY

Melnotte McCants

Melnotte McCants, vice-president and general manager of the Market Street Railway, San Francisco, Cal., died on Sept. 4. As a citizen, his help was of great value in numerous community projects and he was in constant demand in this regard. Among the rank and file of the company at San Francisco Mr. McCants established himself as a broad-minded official, impartial in his decisions. His appointment to the post of general manager in 1923 afforded a striking illustration that preachment and practice are synonymous in meaning on the Market Street Railway, for employees entering the service of the company were reminded at the inception of the term of their employment that "the highest position in the gift of the company is open to the qualified employee." He has been very active in affairs of the American Electric Railway Association and his services have been sought by the various committees of the association such as the committee on education, the committee on merchandising transportation, etc.



Melnotte McCants

Mr. McCants was a native of Spartanburg, S. C. He entered the employment of the leading railroad of that district—the Southern—as a clerk. In addition to mastering his regular duties, he took up the study of stenography at night school; and it was his proficiency in this line that brought him to the United Railroads, the predecessor of the Market Street Railway, in 1906 as stenographer in the president's office.

In 1910 he was appointed chief clerk to the general manager. In March, 1918, he became assistant to the general manager. In August, 1919, he was promoted to assistant general manager. And in 1923 came his elevation to an executive post.

CHARLES H. BARRINGER superintendent of operations at the Salisbury branch of the Southern Public Utilities Company, died recently. When the Duke interests purchased the North Carolina Public Service properties at Salisbury about a year ago Mr. Barringer had reached the position of superintendent of operations. Manager Everest immediately made him superintendent of the combined properties. He was 32 years old.

WILLIAM J. ROOME, who was connected with the Brooklyn surface lines for more than 31 years, died recently after a short illness. Mr. Roome had been active in his duties as division superintendent until about a week before his death. His electric railway career in Brooklyn began in May, 1897, at the 58th Street depot of the Brooklyn Rapid Transit Company, the predecessor of the Brooklyn-Manhattan Transit Corporation, when he secured employment as a transfer agent. Seven years later, in April, 1904, he was promoted to the grade of inspector. In 1906, he was transferred from 58th Street depot to Canarsie depot to fill the position of day depot master and he remained at that depot more than four years. He then returned to 58th Street depot in the capacity of day depot master. As recently as May 1, 1927, he was appointed division superintendent at 58th Street depot to succeed the late Morton S. Cornell.

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Manufactures *and the* Markets

Largest Electric Railway Exports to Canada

Out of $133,103 worth of railway signals, switches and attachments exported in the month of June, $104,026 worth of this equipment went to Canada. Exports of $51,709 worth of starting and control equipment for electric railway and vehicle motors were made in June, $39,697 worth of which was sent to Soviet Russia in Europe. Chile received most of the mining and industrial electric locomotives, $74,275 worth out of a total of $81,250 exported. Only one electric railway locomotive, at a cost of $4,552, was exported, and three railway motors, at a cost of $12,438. The value of the total exportation of the above mentioned equipment for the month of June reached $283,052.

Foreign Commerce Advisory Committee Appointed

William Butterworth, president of the Chamber of Commerce of the United States, has announced the new foreign commerce department advisory committee for the year 1928-1929. Charles W. Lonsdale, president, Simonds-Shields-Lonsdale Grain Company, Kansas City, Mo., will continue as chairman of the foreign commerce committee during the coming year. Walter M. Daniel, member of the board of directors representing foreign commerce, and also a director of the American Chamber of Commerce in Cuba, will continue as vice-chairman of the committee. Henry D. Sharpe, president of Brown & Sharpe Manufacturing Company, Providence, will also continue as a member of the foreign commerce committee.

Other members are:

Harry A. Black, president Black Hardware Company, Galveston, Tex.

E. A. Emerson, vice-president and general manager Armco International Corporation, Middletown, Ohio.

F. Abbot Goodhue, president International Acceptance Bank, New York City.

Julius Goslin, president, Joubert & Goslin Machine Foundry Company, Birmingham, Ala.

Henry H. Morse, sales export manager the Florence Stove Manufacturing Company, Boston, Mass.

G. R. Parker, Parker, Peebles & Company, Inc., New York City.

C. G. Pfeiffer, vice-president George Borgfeldt & Company, New York City.

William C. Redfield of New York City, formerly Secretary of Commerce.

H. H. Rice, assistant to the president General Motors Corporation, Detroit, Mich.

Harold F. Seymour, vice-president Columbian Vise & Manufacturing Company, Cleveland, Ohio.

Paul Shoup, executive vice-president of the Southern Pacific Railway Company, San Francisco, Cal., and vice-president of the Chamber of Commerce of the United States.

L. P. Thayer, vice-president of the International Harvester Company, Chicago, Ill.

Charles J. Webb, Charles J. Webb & Company, Philadelphia, Pa.

The first meeting of the new committee will be at Hot Springs, Ark., on Oct. 6, in connection with the Chamber's conference of national councillors and presidents and secretaries of organization members.

Substations for Northwestern Pacific

Two new power substations will be built by the Northwestern Pacific Railroad, San Francisco, Cal., one at Pine, near Sausalito, of 2,000 hp., and the other at Baltimore Park of 1,355 hp. The present power house at San Anselmo will be reconstructed with a capacity of 2,667 hp., for which the equipment has been ordered from the General Electric Company.

The steam generating plant at the Alto power house will be replaced with electric conversion apparatus with a capacity of 3,000 hp.

Accounting Consultant at Purchases and Stores Exhibit

W. V. Shoemaker, chief stores accountant of the Philadelphia Company, Pittsburgh, Pa., and subsidiary companies, will be at the exhibit booth of the Purchases and Stores Division of the American Electric Railway Engineering Association at the Cleveland Convention. He will explain the procedure and answer questions on the exhibit of forms and methods of stores accounting to be shown in the division's booth. Other features of this exhibit include a delineascope through which will be shown views of labor-saving devices for material handling and methods of material storage used in 34 different utilities. Everyone is invited to visit this exhibit and discuss their purchasing and stores problems with the members of the purchases and stores committee.

Metal, Coal and Material Prices F.o.b. Refinery

	Sept. 4, 1928
Metals—New York	
Copper, electrolytic, cents per lb	14.525
Copper wire, cents per lb	16.625
Lead, cents per lb	6.4
Zinc, cents per lb	6 60
Tin, Straits, cents per lb	47.9375
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$2.175
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1 8
Franklin, Ill., screenings, Chicago, net tons	1.50
Central, Ill., screenings, Chicago, net tons	1.475
Kansas screenings, Kansas City, net tons	2 175
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.3
Weatherproof wire base, N.Y., cents per lb.	17.125
Cement, Chicago net prices, without bags	$2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.1
White lead in oil (100-lb. keg), N. Y., cents per lb	13 25
Turpentine (bbl. lots), N. Y., per gal	$0.55

Model Municipal Traffic Ordinance Issued

The committee on municipal traffic ordinances and regulations of the National Conference on Street and Highway Safety has prepared and published a 92-page "Model Municipal Traffic Ordinance" aimed at as nearly nation-wide uniformity in traffic regulations as compatible with local requirements. It is accompanied by an explanatory report and suggested drafts of the following three supplementary ordinances: (1) To create an official traffic commission; (2) to create a division of traffic engineering; (3) to control roadway and sidewalk obstructions.

Convention Open to Public

The exhibits at the American Electric Railway Association Convention will be open to the public Saturday, Sept. 22, in the afternoon from 1 to 5 p.m., and Sunday, Sept. 23, from 1 to 5 p.m., and from 7:30 to 10 p.m. On Tuesday evening, Sept. 25, the public will be admitted to the balcony only. The convention is open to the public under the auspices of the Cleveland convention committee. Director of Exhibits Fred Dell emphasizes the necessity for exhibitors to have representatives in their booths whenever the buildings are open to the public.

Bennett on N.E.M.A. Executive Committee

Election of I. A. Bennett to the executive committee of the National Electrical Manufacturers Association was announced at the recent convention of the policies division at Association Island, N. Y. Mr. Bennett is vice-president and general sales manager of the National Electric Products Corporation of Pittsburgh, Pa.

Trade Notes

Ideal Commutator Dresser Company, Sycamore, Ill., has appointed the Industrial Supply Company, 121 Motor Avenue, Salt Lake City, Utah, as its representative in the Rocky Mountain district.

Ford, Bacon & Davis, Inc., has changed its address to 39 Broadway, New York, N. Y.

Improved Equipment Company, New York, has merged with the Russell Engineering Company, St. Louis, Mo., according to an announcement by Henry L. Doherty & Company. The new organization will be known as the Improved Equipment-Russell Engineering Corporation. The combination was effected to meet more adequately the demand for efficient coal gas plants and modern carbonizing equipment.

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More Speed with Comfort
Exceptional Light Weight
***with* Strength**

Low Maintenance!

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Springfield, Mass.

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THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

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MAINTENANCE AND CONSTRUCTION ISSUE

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. SEPTEMBER 15, 1928 Twenty Cents Per Copy

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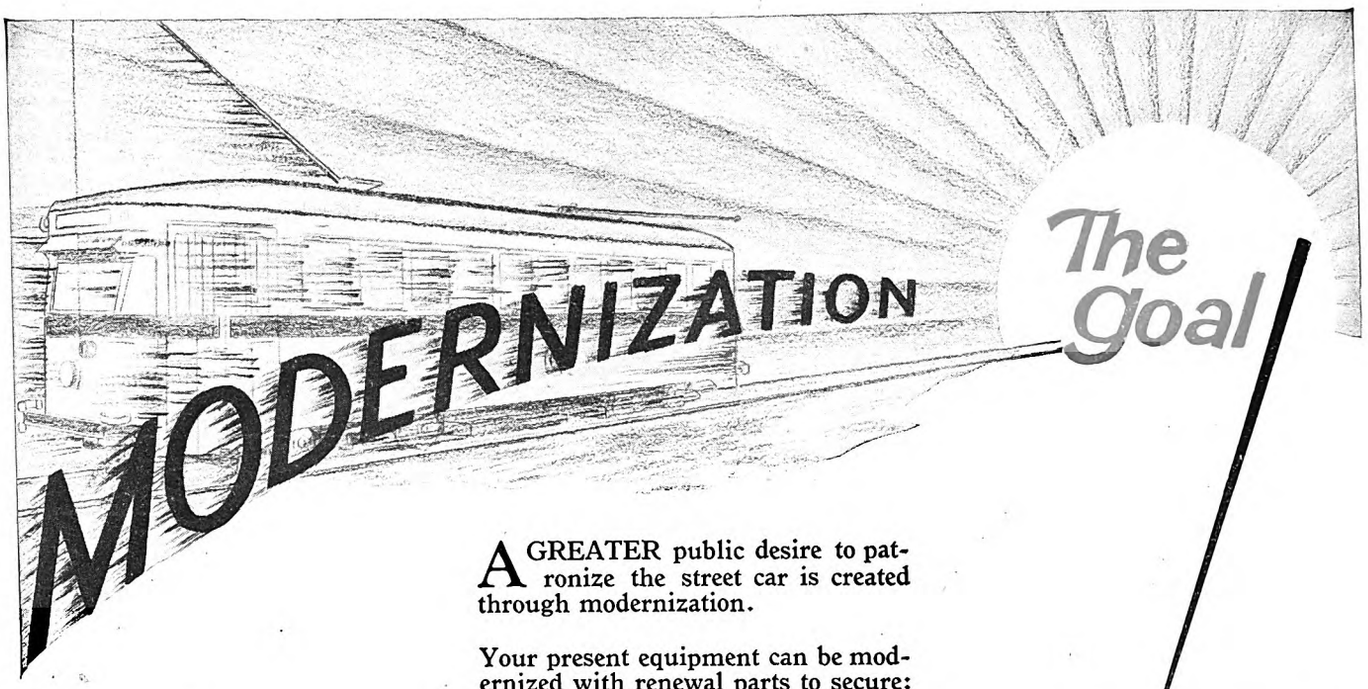

MODERNIZATION The Goal

A GREATER public desire to patronize the street car is created through modernization.

Your present equipment can be modernized with renewal parts to secure:

Higher acceleration and speed
Lower maintenance cost
Minimum failures in service

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

CHARLES GORDON, *Editor*

LOUIS F. STOLL, *General Manager*

Volume 72 New York, Saturday, September 15, 1928 *Number 11*

Making the Most of the Convention Exhibit

LITERALLY millions of dollars worth of electric railway equipment will be on display at the Cleveland convention beginning next Saturday, Sept. 22. There will be presented for the inspection of railway men for the first time many developments in standard apparatus and many new designs and devices intended to improve operation or reduce cost. More than 200 manufacturers will display products running into thousands of different items.

Even those who are so fortunate as to be able to go to the convention will scarce have the time to inspect carefully all of the exhibits in which they are interested. The much greater body of local transportation men who stay at home to keep the wheels of transportations turning for the millions who must be served rain or shine, week day or Sunday—convention or no convention—would in the ordinary course of events have no opportunity of studying this great display of equipment and apparatus.

To help those who go to Cleveland, and at the same time to take the exhibit to the man who must stay on the job, ELECTRIC RAILWAY JOURNAL has, with the co-operation of the association and of the manufacturers, translated this entire spectacle into type and pictures. The equipment and apparatus to be shown are grouped into a series of articles arranged for the convenience of the man interested in analyzing the progress made in any particular class of products.

All of this will be published in next week's issue of the JOURNAL and will be available in Cleveland on Saturday when the exhibit opens. Many new things are to be shown for the first time and several surprises are in store. By using that issue as a guide to the products in which they are most interested, delegates to the convention may make the most of their time at the show, and may be sure not to miss any of the developments which they ought to see. Copies of the A.E.R.A. Exhibit Issue will be available at the JOURNAL's booth, spaces 101-102—just inside the main entrance to the auditorium.

Noise Reduction Study Is Constructive

DETERMINATION of the sources of noises that develop in the movement of street cars is the first requisite to finding means for eliminating the noises themselves. While several electric railway men have worked on the problem and have gained some knowledge of the subject, one of the best organized projects is that of the Transportation Section of the Wisconsin Utilities Association. This body, some three years ago, established a fellowship at the University of Wisconsin for the purpose of developing methods of segregation and measurement of the various noises and then making tests on cars in actual service.

The apparatus designed the first year was somewhat crude and the tests were of comparatively little value. The second year was spent principally in redesigning the instruments, and the past year has been devoted to an actual study of the noise as found on street car lines in several Wisconsin cities. Silas B. Tobey, who was last year's fellow, made a report at the recent meeting of the Wisconsin Utilities Association. His findings were given in the issue of Sept. 1. The results are the fairly obvious ones that are more or less familiar to all railway men. It was found that the type of paving has a marked effect on the noise produced when a car runs over it. That was to be expected. The tests also showed that joints which will give a continuous running surface for the wheels are at least equal in importance to the use of the proper materials for subgrade, ballast and ties. Maintenance of the car so that squeaks and rattles are eliminated was found effective in reducing noise. A result not quite so obvious to the layman, although it might have been anticipated by the scientist, was that soft cushioned seats absorb much of the noise inside the car.

It is to be hoped that the investigation will be carried forward so that, more and more, the causes of noise will be located, measured and segregated. The beginning which has been made is good and points the way to a more serious study of the subject than has yet been made.

When the Automobile Customers Run Out

PREDICTIONS of approaching saturation of passenger automobiles have been made from time to time, but one after another the various statements that have been given out as the number of automobiles that the country will support have been found in error as the registration figures have passed by them. So it has been necessary to push the computed saturation point farther and farther away. The latest contributor to this series of estimates is Robert H. Whitten, who seems to have gone as far as it is possible to go. His estimate is given in some detail on page 337 in the Sept. 1 issue. Charts of registration of automobiles indicate that the increase in number of cars is following the same general course all over the country, although naturally it differs in the several states considered. That there is a nationwide trend he believes unmistakable.

Naturally the number of automobiles that can be used at any time cannot be taken into account apart from consideration of the population at that time, for even the most ambitious salesman would find it difficult to see a market in excess of the number of drivers—at least not at the present time. Based on the Pearl-Reed curve of population growth and the automobile registrations up to the present, Mr. Whitten, with the aid of well-known principles of analytic geometry, has calculated the number of automobiles to be anticipated in the United States at any time for the next 27 years. He finds that, while

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the number of automobiles is increasing year by year, the rate of increase has fallen off somewhat year by year since 1923. Determining a mathematical equation for the curve, he predicts that the rate of increase will continue to fall off until in about ten years there will be virtual saturation. That is, the number of additional automobiles sold each year above replacements will be in direct proportion to the increase in population. By 1937, as he computes it, there will be some 260 automobiles for every 1,000 persons, or 3.8 persons per automobile. That, of course, presupposes that Mr. Ford or some other aggressive manufacturer does not bring out a new model. In 1955, the last year for which Mr. Whitten has extended his curve, there should be 43,687,000 automobiles for 160,850,000 people in the United States, or 3.7 persons per automobile.

Looking at it from today's viewpoint, this would seem to be just about the limit of cars that can be supported —or run—by the American public. It must be remembered that there are still children, aged persons and cripples who cannot drive. Then there always will be an element of the population whose occupation will be to drive automobiles or trucks for others, so they will not be good prospects even for the aggressive automobile salesman.

If the estimate is borne out, nearly everyone other than those mentioned will have a car of his own. How much of a field for public transportation there will be with this enormous number of automobiles in service is a matter of conjecture. That all these cars can be on the streets and highways of the country at once seems highly improbable, judging from what has taken place in the past. That enough parking space can be provided to care for all of them immediately adjacent to the heart of the business district is also absurd. It is likely that the supply of red cardboard for police "tickets" will be exhausted. Meanwhile, the public carriers should play their part by not losing courage, furnishing meanwhile a brand of transportation so attractive that it will induce the army of automobile owners to leave their cars in the garage and take the street cars—at least for part of their personal needs.

Opportunities for the Use of Light-Weight Metals

EMPLOYMENT of aluminum in railway distribution systems in this country is confined largely, if not entirely, to feeders. While more expensive per pound than copper, the cost per unit of conductivity of aluminum, as compared with copper, does not differ greatly. The early installations of overhead aluminum feeder cables were not particularly satisfactory, owing to the tendency of the cables on long spans to stretch and thus increase their sag. This objection has now been overcome by the introduction in the center of each cable of a steel wire to increase the tensile strength of the cable to the necessary amount.

Another use in the distribution system of aluminum, or rather aluminum alloys, being tried abroad, is in overhead fittings, as described in a recent issue. The purpose, of course, is to decrease the weight of the overhead system, partly to reduce the size and cost of the supporting structure but principally to reduce trolley wire breakage. It is thought that by lessening the weight and consequently the inertia of each cross span, there will be less tendency of the trolley wire to bend upward at the point where it enters the ear of a hanger or overhead part during the passage of a trolley wheel, and so less chance for it finally to become so weak as to break at this point.

For use in such hangers and other overhead parts, pure aluminum evidently is not suitable, owing to its softness, but certain aluminum alloys are. Among those being tried the best known in this country is duralumin. In this country duralumin has been used principally where tensile strength, combined with lightness, has been desired. Thus it is a favorite material in the construction of the framework of dirigibles. For overhead fittings it also has the merit of being readily forged. Altogether, the trial being conducted in Paris is worth watching.

It seems that in the electric railway field there should be more opportunity to use some of the various light-weight metals than is being done at present. Some twenty years ago a prominent engineer calculated that it costs from 5 to 7½ cents a year to haul every pound of material in a street car. If the cost then was from 5 to 7½ cents, it is probably at least 12 cents now. In other words, every pound by which the railway car can be lightened without decreasing its strength, capacity or life, saves 12 cents a year. If this sum is capitalized at 15 per cent a year, half for interest and half for depreciation, 80 cents a pound can be paid for such a saving, roughly speaking.

Articulated Units Increase in Popularity

UNUSUAL interest attaches to recent designs of articulated cars for service on routes of heavy traffic density in large cities. The latest instance of experiments with this type of equipment is afforded by the two articulated units recently completed for the Montreal Tramways described in detail in an article elsewhere in this issue. Two weeks ago, in the Sept. 1, 1928, issue of the JOURNAL, there was presented the complete design of the new articulated cars of the Cleveland Railway. Construction of 25 of these units followed operating tests of the sample unit completed just about a year ago, and shown at last year's convention.

Interest in the articulated type of car in this country dates back a number of years to the experiments undertaken by the Milwaukee Electric Railway & Light Company. Although these consisted of old car bodies joined to form articulated units for rush-hour service to take the place of motor cars and trailers, they have proved so successful that a large proportion of the heavier types of double-truck city cars formerly in service in that city have been converted to articulated units, and the use of this type of equipment has been extended to all-day service on some lines.

In the construction of the sample three-section, four-truck unit for Detroit by the Cincinnati Car Company a number of years ago, was featured the drum type of vestibule. Montreal now introduces a combination of the drum with diaphragms, which it is claimed offers special advantages. The Detroit car was, so far as is known, the first attempt in this country to extend the idea of articulation to units of more than two bodies. Subsequently, articulated construction was adopted for rapid transit service by the Brooklyn-Manhattan Transit Corporation. There the use of multiple body units was carried to its logical application for handling traffic of very heavy density. The articulated type of unit also spread to interurban service on lines where trains of more than one car are normally operated. The installations by the Washington, Baltimore & Annapolis Rail-

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way, and by the Milwaukee Electric Railway & Light Company between Milwaukee and Watertown, afford two outstanding examples of this latter development.

Although differences of opinion exist regarding the relative advantages and limitations of articulated units for various classes of electric railway service, there seems to be a steady spread of the use of this type of equipment. It offers obvious economies in weight, in first cost and in operating costs due to reduction in excess platform labor required to handle a unit of given carrying capacity. By affording free communication between cars even when operating on short radius curves, articulated units permit more uniform distribution of passenger load, and therefore more comfortable and convenient service to the public. The primary limitation of this type of equipment is that it is useful only for handling traffic which is sufficiently dense to justify the operation of large units.

Obviously, the money which goes into new cars should provide equipment suitable for all-day operation. Only in that way is the full economy of car modernization obtained. From this point of view, the Milwaukee plan of constructing articulated units from its old cars, and putting new money into light-weight cars suitable for base schedule operation on most lines, seems to be a wise one. Whether or not traffic densities in Cleveland or Montreal are sufficiently heavy to justify operation of articulated units all day without producing excessively long headways in the non-rush hours is a matter that both of these properties undoubtedly considered carefully before going into this type of equipment. In the fact that both properties now operate a considerable proportion of two-car trains there is evidence that there was an opportunity for producing substantial operating economies with articulated equipment. But there is always the temptation in the industry to grasp the economy that results from larger units, without giving adequate weight to the effect of lengthened schedules upon patronage—particularly in the non-rush hours. There are some railway executives who lean to the opinion that the traffic densities on only a very few surface car lines in the country are sufficient to justify the operation of units of more than one car each.

Bringing the Shop to the Job

WORK such as maintenance repairs can be done much better if taken to the shop where proper facilities are available and where the workmen are specialists. While this is the universal opinion, in some of the recent electric railway shops there is a noteworthy tendency toward increased use of portable equipment so that repairs can be done speedily without the necessity for dismantling the parts. By this method much time is saved and still the advantages of using proper tools and having the work done by high-grade mechanics is retained.

Pneumatic chisels and riveters, along with portable rivet heating furnaces, lighten the work of truck repairs. Electric outlets of sufficient current capacity in each section where welding repairs are made permit the permanent installation of large welding equipment, and still the workmen can plug in and obtain the necessary current right on the job. Piping of oil to the point where it is used eliminates many trips of the workmen to the oil house. Electric outlets for testing, located right at the point where the work is done, and the provision of many light portable tools are included as part of the facilities in these most modern shops.

The same principles can be adopted for track and line maintenance with satisfactory results, and it is unnecessary to have new shops to use such equipment. Most of it is of a design that can be used most anywhere. The saving in time will often pay quickly for the new equipment.

New Jersey Modernizes Its Traffic Laws

PROVISIONS of particular significance to public transportation agencies are contained in a uniform traffic act which became effective throughout the state of New Jersey on the first of this month. The new law, which was passed after many legislative vicissitudes, closely follows the recommendations of the Conference on National Highway Safety and also those of the Committee on Municipal Traffic Regulation. Recommendations of the American Engineering Council were followed in regard to traffic signs and signals. The act covers not only those subjects commonly found in state traffic laws, but also matters ordinarily taken care of by municipal ordinances. An important provision is the restriction of municipalities from passing traffic ordinances not in accord with the new state law.

Bus operators undoubtedly will benefit by the liberalization of speed laws. Under the recently adopted regulations, traffic may travel at 40 m.p.h. in the open country, whereas the limit formerly was 30 m.p.h. This is clearly in line with progressive thinking on traffic regulation. Careless driving, not excessive speed, is responsible for most accidents. Progress in automotive design has produced a vehicle which today can be operated safely at 40 m.p.h. on an open road and common sense demands that this be permitted. The new regulation allowing a speed of 30 m.p.h. in municipalities where traffic is controlled by modern signal systems is equally reasonable.

An attempt will also be made to regulate pedestrian movement. At intersections controlled by a traffic officer or by a signal, pedestrians are prohibited from crossing against the red light. At other intersections the pedestrian may cross at will and has the right of way over vehicles. Under all circumstances, however, the pedestrian is expected to cross by a crosswalk or at right angles to the curb. Opinions differ as to the probable success of this provision. A somewhat similar regulation has been in effect for some time past at the busy intersection of Broad and Market Streets, Newark. This has worked very well and has speeded up the movement of vehicular traffic. Its enforcement has been difficult, however, and the possibility of extending the system throughout the entire state, particularly at intersections where there is only a traffic signal and no policeman, seems extremely doubtful.

A provision in the new law of interest to public transportation agencies is that which prohibits persons from standing in the roadway and soliciting rides from a passing private vehicle. Accident prevention was the underlying reason for the inclusion of this provision in the law, but motorists will rejoice also at their freedom from the annoyance which this practice has caused in the past. Whether or not any substantial amount of traffic will be gained on this account by the public transportation agencies it is obviously a step in the right direction and will meet with general approval.

Time will be required to determine the success of these new regulations. Opinion is not unanimous concerning the wisdom of certain provisions. In general, however, it is evident that New Jersey has taken a long step forward in modernizing its traffic laws.

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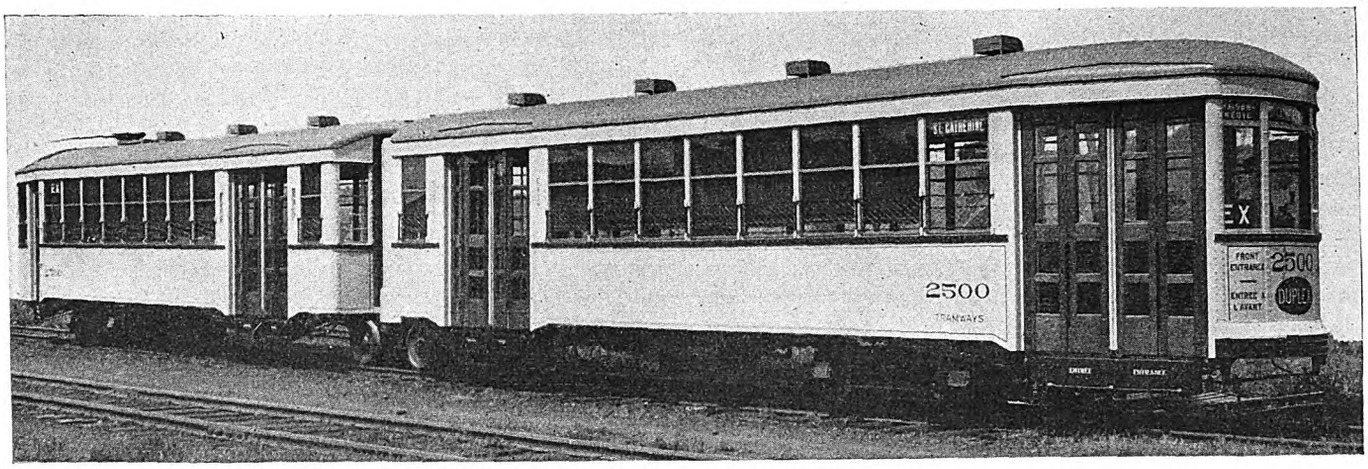
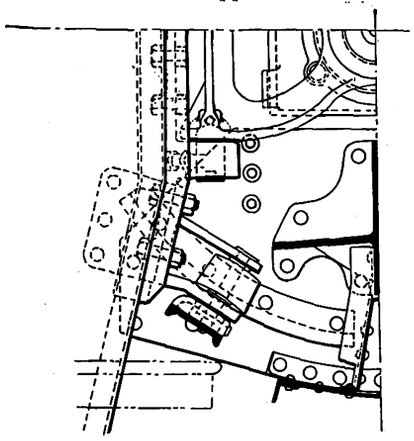
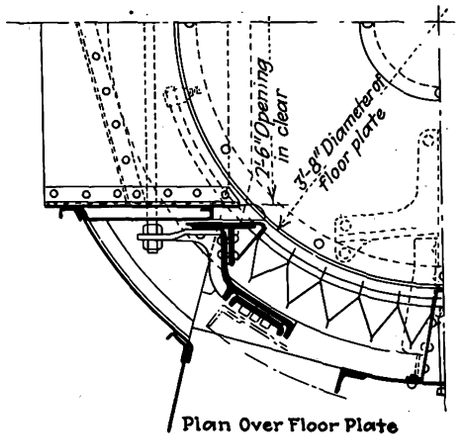


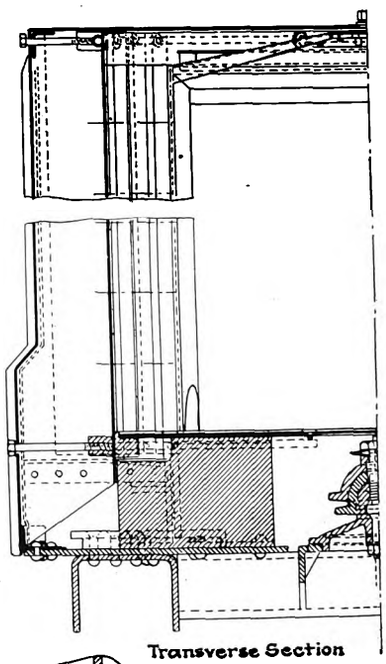
The appearance of the articulated unit conforms to that of the standard double-truck cars in Montreal



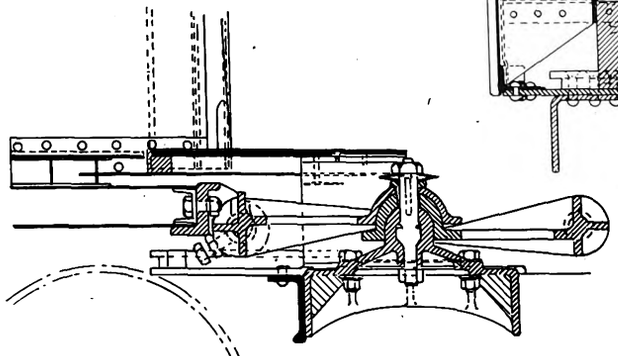
Plan, Under Floor Plate



Plan Over Floor Plate

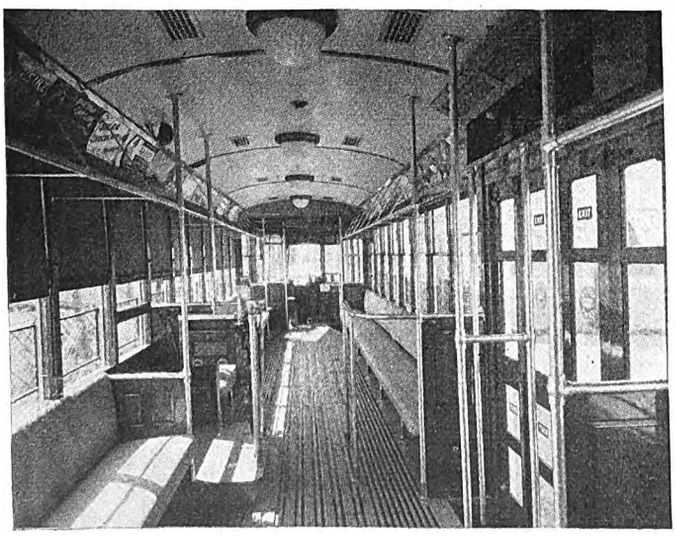


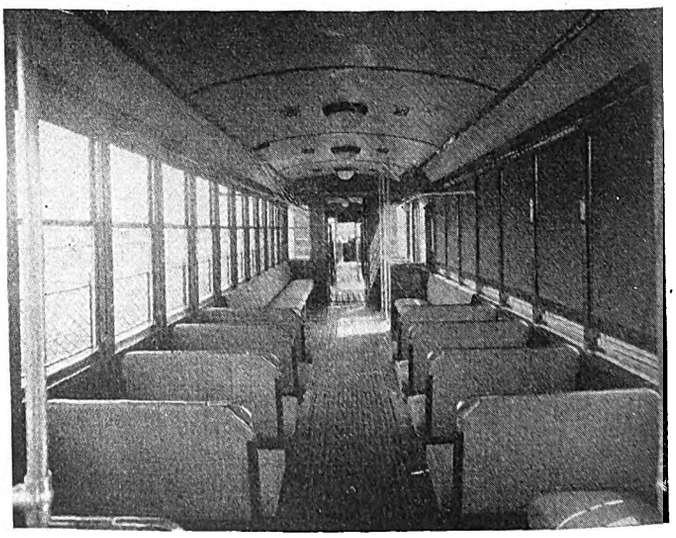
Transverse Section



Longitudinal Section, Lower Part

Details of the articulation, showing the combination of drum and bellows





At left—Longitudinal seats are installed in the front section of the unit. There is a stand for the conductor opposite the exit door. At right—Cross seats are used in the back portion of the rear section, with a few longitudinal seats forward. The passageway through to the forward section will be seen in the background

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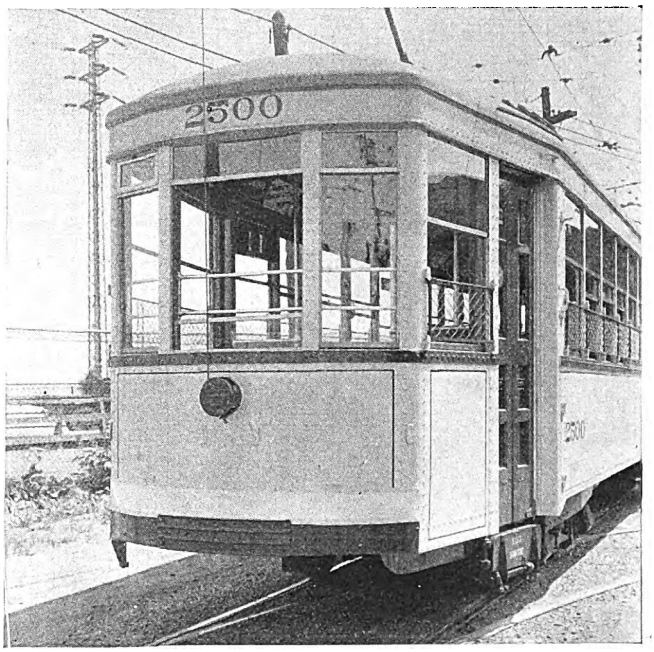
Combined Drum and Bellows Connection Features

Montreal's Articulated Car

Experimental units recently put in service combine the two types to maintain a wide opening between the two bodies at all times. The cars are designed for rush-hour service only, although they are suitable for all-day service



The trolley is at the rear end of the unit

WITHIN the past few weeks two articulated units of a new design have been placed in service on the lines of the Montreal Tramways, Montreal, Canada. The general features of these cars were designed by the officials of the Tramways company, the details being developed by the builders, the Canadian Car & Foundry Company of Montreal. The car embodies several departures from previous designs of this type of equipment. The result is a noiseless and practically air-tight articulation. This consists in a combination of drum and bellows, one or the other of which has previously been used alone in articulated units.

In Montreal a very large proportion of the total daily movement of passengers is concentrated between the hours of 7 and 9 a.m. and 5 and 6:30 p.m. The maximum number of cars in actual service at these rush hours is about three times that necessary to serve the various routes during the remainder of the day. On some particular routes the number of cars during rush hours is six times the normal. The chief problem in a city the size of Montreal is not only to put out a sufficient number of cars to accommodate all passengers who require transportation but to find the best ways and means to get a sufficient number of cars loaded and passed through the narrow, congested streets and intersections in the area south of Mount Royal Avenue and between Papineau and Atwater Avenues. The limited width of the streets in this district, the sharp curves and the intersections have forced the tramways to restrict the maximum length of a car to about 45 ft. Two-car trailer trains have been used to some extent, with a total length of about 92 ft. The new duplex cars have practically the same capacity as a trailer train, with a total length over all of about 80 ft.

The general appearance of the car is shown in the accompanying illustrations. All passengers enter by a large front door nearly 6 ft. wide. There are three separate exits, one two-stream exit near the rear of the front section, one two-stream exit near the front of the second section and a single-stream exit at the rear. All exits in the rear section are equipped with automatic treadles. The doors, however, are under the complete control of the conductor, whose position is at the rear of the forward section so that he has a good view of all exits at all times. The three automatic doors in the rear section are interlocked with the motors and brakes so that the car cannot be started until all of the doors are closed, and the doors cannot be opened until the car has stopped. Through the use of an emergency button the conductor can open all doors in both sections.

The unit is 80 ft. $\frac{1}{2}$ in. long over all, the front and rear bodies being of equal length, 30 ft. $9\frac{11}{16}$ in. The front and rear vestibules are each 6 ft. 11 in. long, and taper toward the ends. The width of the bodies is 8 ft. $4\frac{11}{16}$ in. over the eaves. The height from the rail to the top of the roof is 11 ft. $1\frac{1}{2}$ in. and the height of the floor above the rail is 34 in. The leading and trailing trucks of the unit have a 5-ft. 4-in. wheelbase, with 26-in. diameter wheels; the center truck, which does not carry motors, has a wheelbase of 4 ft. 4 in. with 24-in. wheels.

The articulation coupling between the two sections of the car, shown in one of the diagrams, is designed on the universal joint principle, obviating difficulty in turning, even on curves of minimum radius. A special feature of the articulated unit is that the rear end of the front section and the front end of the rear section both travel on a common turntable which is supported by a very soft spring arrangement. The construction of this turntable prevents any twisting action between the two bodies around the coupling. The weight is carried on rollers. The cup-and-ball connection acts only to couple the units together. The floor of the passageway between the two car bodies is flush with the floors of both at all

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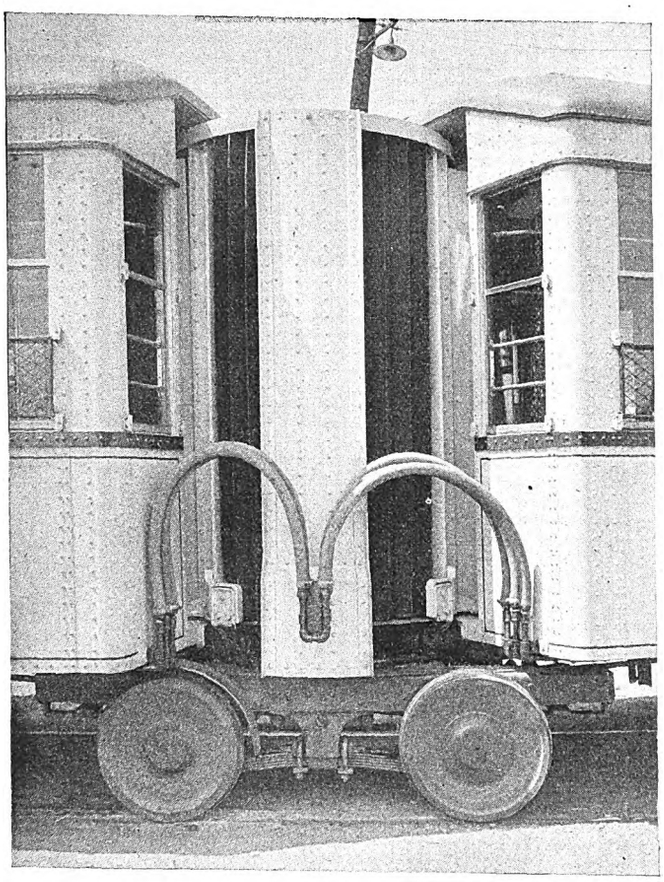
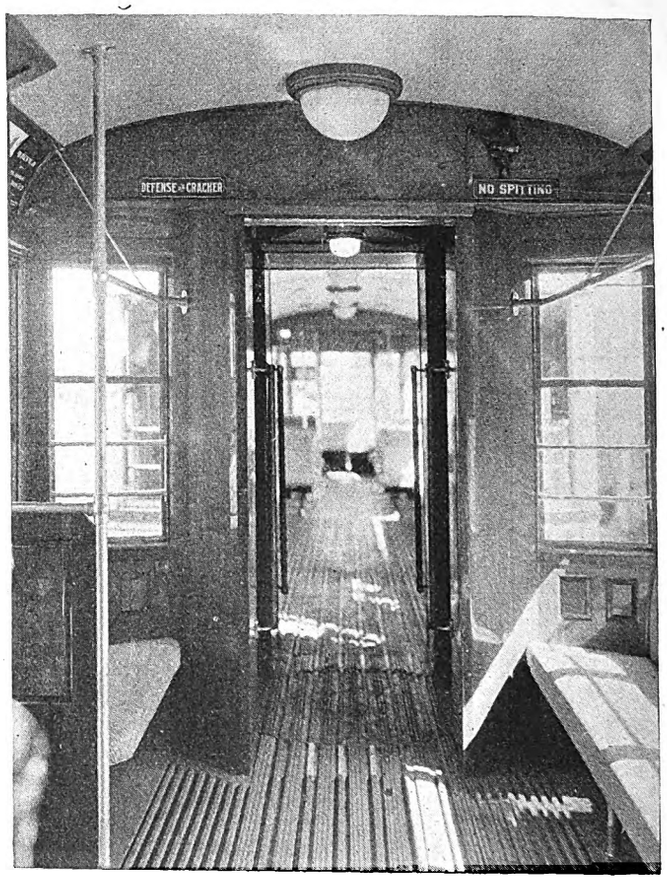
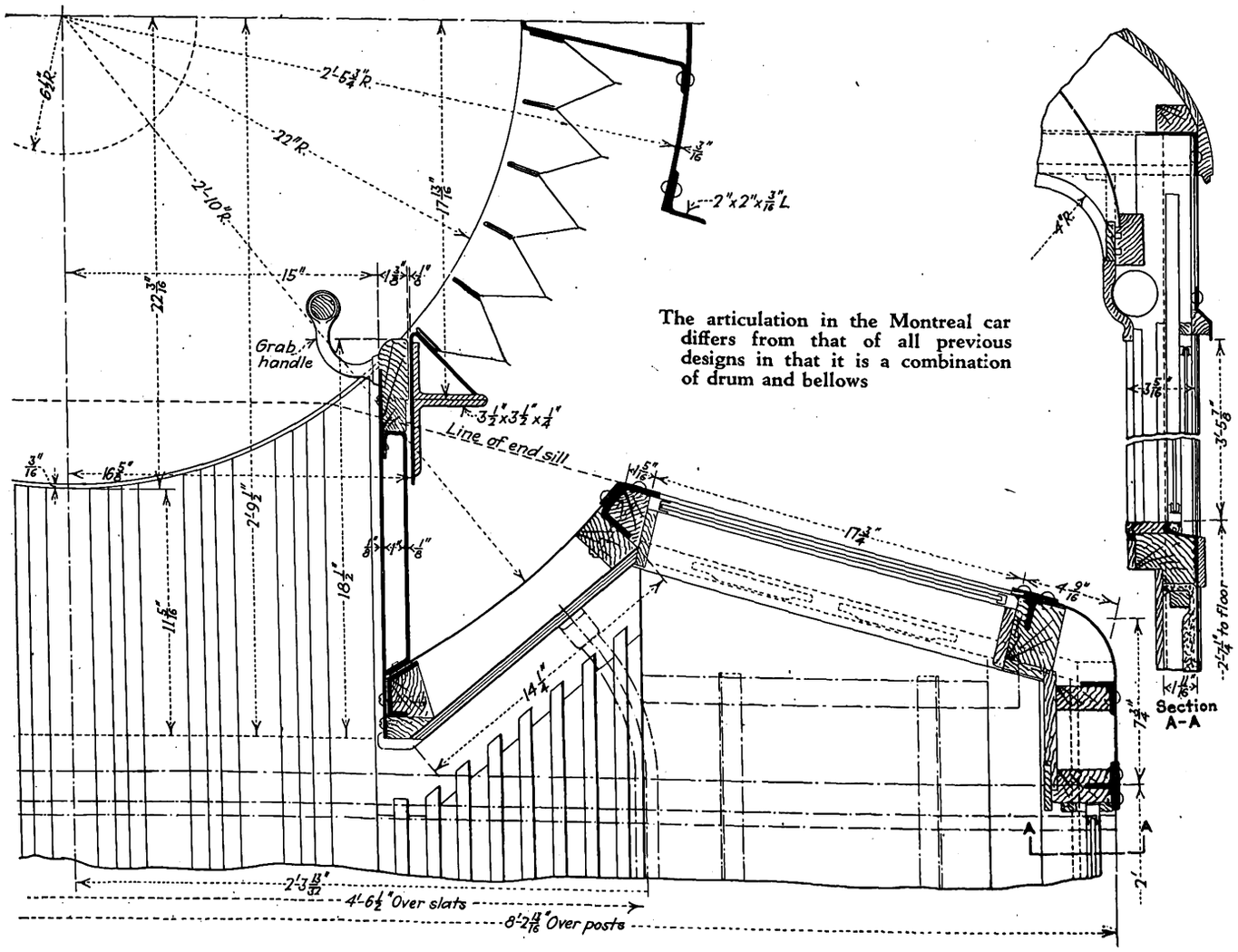


A near view of the drum connecting the two sections. The bellows at either side of the drum are not seen in the picture



Framing around the windows at the drum. Good lighting at the inner ends of the two bodies is obtained in this manner



The articulation in the Montreal car differs from that of all previous designs in that it is a combination of drum and bellows

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times, even when taking a curve at the top or bottom of a grade.

The passage through the vestibule over the articulation coupling is of ample width, and the vestibule is proof against rain and snow, an important consideration in encouraging passengers to use the rear section. In each section the floor is covered with safety treads, and there are window guards over the windows of each section. The current-collecting equipment is mounted on the roof of the rear section. The free space between the motorman and the conductor is practically the same as in many standard pay-as-you-pass cars, and covers about one-third of the space in the entire unit.

In the first unit the seats in the front section are arranged longitudinally, while those in the rear section are arranged both transversely and longitudinally. The front section seats 41 and the rear section 49, a total of 90. There is standing room for 108 passengers, making the total rush-hour capacity 198.

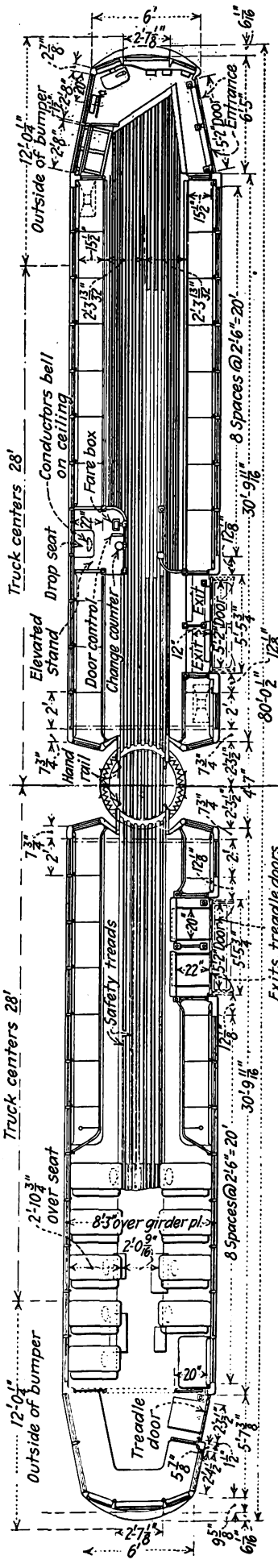
COMPARATIVE OPERATING EXPENSE, STANDARD CAR AND ARTICULATED UNIT

	Cents per Car-Mile	
	46-ft. Car	Articulated Car
Overhead expense	15.2	21.7
Platform expense	11.8	11.8
Energy (at 1.25 cents per kilowatt-hour)	5.6	7.8
Maintenance	3.5	4.5
Carhouse expense	1.0	2.0
Total expense	37.1	47.8
Relative cost per single body	37.1	23.9
Relative net economy, per cent	100	65

From his position in the front section of the car, the conductor will control the exit doors in the rear of the front section in the usual manner. For the control of the doors in the rear section the conductor has a three-position switch, which functions as follows: With the switch in the first position the doors are controlled

Length over all	80 ft. 0½ in.
Passenger seats	90
Standing capacity	108
Total rush-hour capacity	198
Weight, light, pounds	58,000
Weight with seated load, pounds	70,000
Weight with rush-hour load, pounds	86,000
Light weight per seat, pounds	630
Light weight per passenger, with rush-hour load, pounds	290
Total weight per passenger, seated load, pounds	770
Total weight per passenger, rush-hour load, pounds	430
Energy demand compared with standard train, empty, per cent	64
Energy demand compared with standard train, seated load, per cent	70
Energy demand compared with standard train, maximum load, per cent	73
Relative energy demand for rush-hour round trip, per cent	72
Weight on driving wheels, per cent of total	75
Maximum grade on which unit can operate all day, per cent	6
Maximum grade in tripper service, per cent	8

by the treadle; with the switch in the second position the treadle feature is cut and the doors are under the control of the conductor, but he is not able to close a rear-section door while a weight of 8 lb. or more is on the step; with the switch in the third position the treadle mechanism is inoperative, so that the doors cannot be opened. Normally the switch will remain in the first position and the rear section doors will require no attention from the conductor, except in unusual circumstances, as when the car stops opposite an excavation, or when the conductor must open the doors at a terminal. The doors are interlocked with the motor control and the brake valve, so that if any door is open the car cannot



The new articulated unit of the Montreal Tramways is slightly more than 80 ft. long and seats 90 passengers

be started, and if a door is opened accidentally while the car is in motion the brakes will be set at once.

No provision is made for a second conductor on the rear section, as it is felt that the inclusion of a third man in the crew would wholly or in part defeat the purpose for which the car was designed. Further, it is felt that the crew will be a safer unit with a two-man car than with three men, since if the automatic equipment fails it fails on the side of safety, while if there is a failure of the human element it is more likely to result in disaster. An auxiliary operating button is placed in the rear section, by means of which an employee riding in that portion of the car can have control of the doors in an emergency.

In the second unit individual bucket type seats are placed at an angle. While the seating capacity is less it was felt that there is a degree of privacy that is not possible with the standard type of seat. The arrangement also gives a greater amount of free aisle space to facilitate movement in the car during rush hours.

Each section of the car will have a brake cylinder to furnish braking power to the wheels of two driving and one idling axle. The controller does not have the dead-man feature, but the doors will not be operative without a pressure of at least 20 lb. in the brake cylinders. If the brakes are released while the doors are open they will be reapplied immediately in emergency.

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This safety feature is in addition to the ordinary power control interlocking so that the car will not start if the doors are open even if it is standing on a grade.

Two Westinghouse 510-A2 motors, rated at 42 hp. each, will be carried on each of the end trucks.

It is the intention to use the cars during rush hours only and to confine them to lines on which the grades are 6 per cent or less, on account of the limitations of motor capacity. On some tripper runs this will be modified and the cars will be placed on routes where there are short momentum grades up to 8 per cent. The motor capacity is sufficient to allow the cars to operate over 6 per cent grades of reasonable length throughout the day, and it also is sufficient to allow the car in tripper service and with relatively cool motors to operate over the 8 per cent grades without overheating.

If extended service with the new units makes it seem desirable to use them on heavier grades than those mentiond, this can be done either by using the Timken type of axles with Cardan drive, with small-diameter lightweight motors or the Westinghouse double-reduction drive. The mounting of two motors of the conventional type on the center truck would necessitate elevation of the car floor 4 in. above the present 34 in.

Other equipment on the cars includes Westinghouse straight air brakes with emergency feature, Hedley anticlimbers, Faraday high-voltage car signal system, Westinghouse DH-16 compressor, standard metal conduit, K-35 control with 806-J-16 line switch, National Lock Washer Company curtain fixtures, Pantasote curtains, Keystone destination signs, National Pneumatic Company door operating mechanism, Cleveland fare boxes, slat floor covering with Kass safety treads, Nuttall helical gears and pinions, Peacock staffless hand brakes, rigid aluminum hand rail, three-ply Salamander insulation, Canadian General Electric heaters with thermostatic control, Haskelite headlining, cherry interior trim, Canadian Car & Foundry Company journal boxes, Safety Car Heating & Lighting Company dome lighting fixtures, O. W. Meissner pneumatic sanders, Robert Mitchell Company sash fixtures, Ottawa Car Manufacturing Company seats, Ohio Brass Company Form A trolley base, Keystone trolley catcher, Lyman Tube & Supply Company Ideal trolley wheels, Railway Utility Company honeycomb ventilators and H-B wheelguards.

Some of the principal figures on the unit are given in an accompanying table.

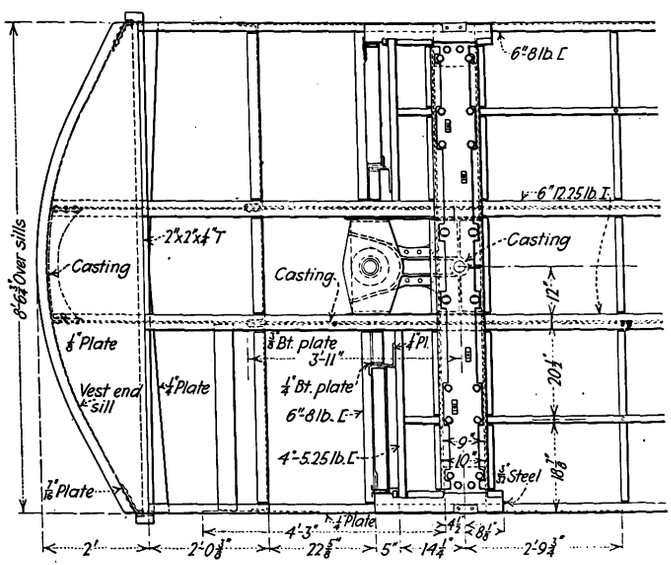
Based on Montreal's experience, an accompanying table shows a comparison of the operating expense for one of the company's standard 46-ft. cars with two men and an estimate of the expense for the articulated car: This is based on 40 car-miles a day for 300 days a year, a total of 12,000 car-miles a year. The energy consumption is based on a seated load throughout the trip.

Interborough Accident Presents Unusual Features

Force of blow against curtain wall in Seventh Avenue subway wreck of Aug. 24 cut ninth car of steel train completely in two

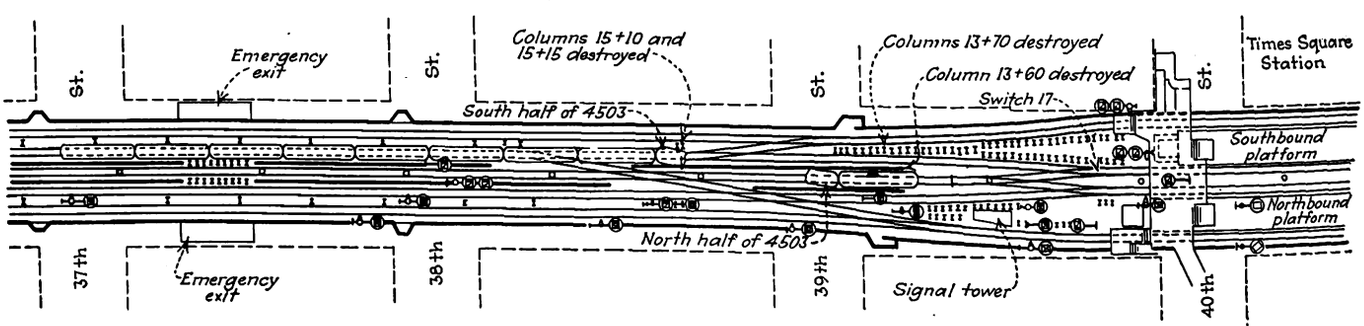
JUST what happened to cause the wreck of a ten-car train which occurred shortly after 5 p.m. on Aug. 24 on the southbound express track at the Times Square subway station of the Interborough Rapid Transit Company in New York City still is a matter of conjecture. It is possible that the details of the failure never will be known completely. They still are under investigation to inquire further into the circumstances surrounding the accident.

In order to understand what occurred, some knowledge of the layout in the vicinity of Times Square station is



Framing of the car that was destroyed. The center sills are continuous and straight from one end to the other, and the side sills are continuous, although they are depressed in the vicinity of the center door

essential. The accompanying map shows the south end of the station, which has four through tracks running approximately north and south. These are spread apart to allow space for station platforms between the two northbound and the two southbound lines, local and express, the latter being in the middle. Immediately south of the station platforms the express tracks are turned outward on either side to give room for a fifth track in the middle of the right-of-way. This track is used for



Layout of tracks south of the Times Square station of the Seventh Avenue subway, showing the position of the two portions of the train after they came to rest

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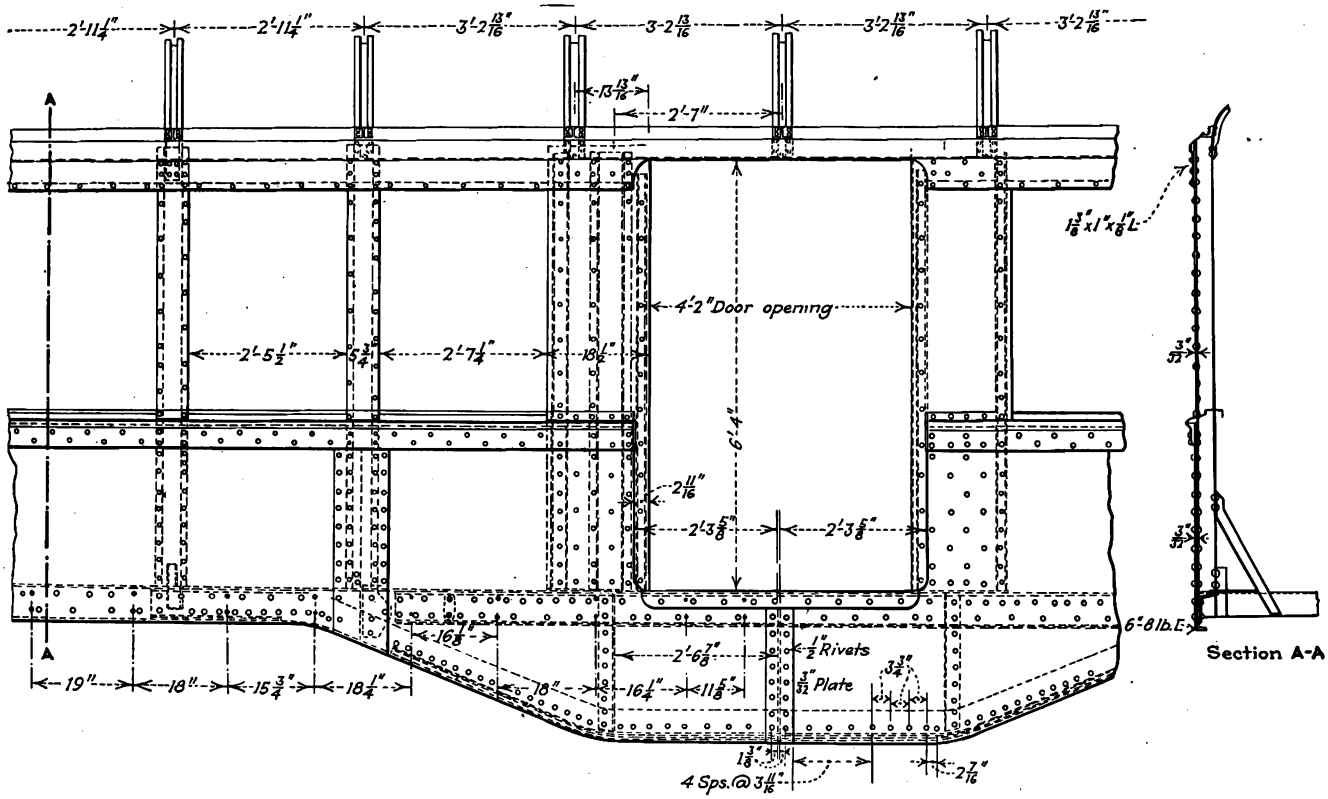
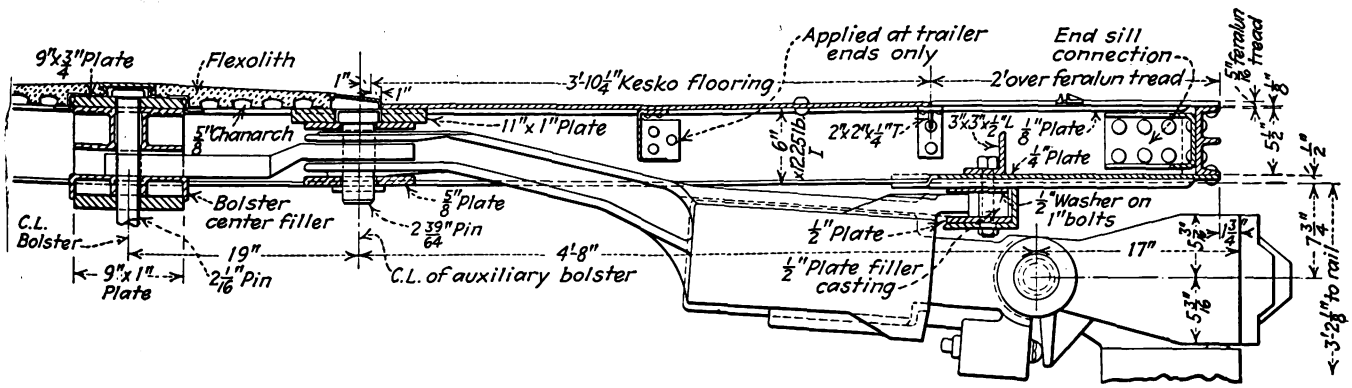


Elevation of framing in the vicinity of the side doors. The body was severed at this point

the purpose of turning back trains which arrive at the station southbound on the express track. It is connected with the southbound main line track with a facing point switch and to the northbound main line by a trailing point switch, both interlocked through a tower located approximately 80 ft. away. All other switches in the immediate vicinity are also interlocked and controlled from the same tower. Signals for informing the motormen of southbound express trains as to the position of the facing point switch, known as No. 17, are located at the south end of the Times Square station, so that trains cannot be signaled to proceed unless the switch position is properly indicated. The signal also is connected with an automatic stop, so that if by any chance the train moves against the signal at this point power will be cut off and the air brakes will be applied automatically. There is a down grade of 0.59 per cent in the station, followed by a 0.29 per cent down grade immediately south of it.

The facts connected with the occurrence of the wreck are now well established. The train in question, which was a standard ten-car steel express of standard make-up, left the Times Square station southbound at 5:08 p.m. The signals were set against the main line, but in order to permit the train to proceed a signal maintainer released the automatic trip and signalled the train by hand. This was apparently done to avoid tying up the southbound express track at the height of the rush hour. The first eight cars passed over the switch successfully, taking the main-line track. The front truck of the ninth car also passed over. The rear truck of this car, as well as both trucks of the tenth car, took the track leading into the siding.

Approximately 130 ft. beyond the point of the switch there is a curtain wall of reinforced concrete and including the main columns supporting the street overhead, separating the middle track from the southbound express track. The ninth car collided with this approximately opposite the middle door with such force that it was cut in two separate pieces. The forward section was dragged approximately 150 ft. before the automatic air brakes stopped the train. The rear portion, propelled by the tenth car, was forced along the middle track for about 70 ft. beyond the end of the curtain wall before it was stopped. Although the car was thus cut in two, the



The drawbar and method of attaching it to the car body

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couplers, which were of the Westinghouse automatic mechanical and air connection type, held the halves of the cars to the ones next to them.

In the progress of the forward end of the train after the curtain wall was struck, column 13-60 at the end of the wall was destroyed, as were columns 13-70 and 13-75 on the opposite side of the express track. At the point where the forward half of the car came to rest columns 15-10 and 15-15 also were destroyed.

Investigation Reveals Car Equipment Not at Fault

The investigation made immediately after the wreck by the Transit Commission indicated that the car equipment was in perfect operating condition and in the judgment of the experts did not cause the accident. The facts collected regarding the occurrence were as follows:

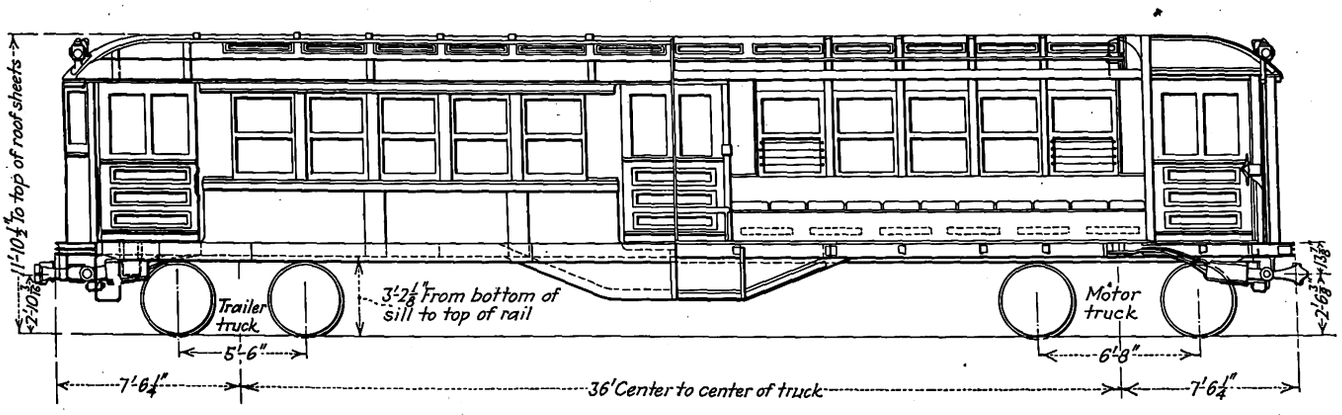
At 4:58 p.m. Towerman H. King, in charge of the I.R.T. signal tower in the Seventh Avenue tunnel, south of 40th Street, reported that he was unable to operate the switch from the middle track at that point and called for Signal Maintainer Baldwin, who was stationed at 34th Street and Seventh Avenue, to come to 40th Street. Towerman King was attempting to operate this switch to allow a special train which came from Van Cortlandt Park to go into the spur track so that it could be turned back northbound from Times Square. As he was unable properly to work the lever on his interlocking machine controlling the switches and signals he called Signal Maintainer Baldwin from the 34th St. I.R.T. station and told him of the trouble.

When the lever failed all of the safety devices functioned perfectly. The signals went to red, and the trains halted. Maintainer Baldwin and Helper Carr came to the scene of the trouble and did what is the comman practice in railroad operation. They manually operated the automatic stop and hand signalled to the motorman, thus allowing the train, which was to have been turned, to proceed on downtown.

The train that was derailed followed immediately after this one, and left the station at 5:08. As to the cause of the change in switch position which caused the accident, the Transit Commission stated that in the opinion of its signal and switch experts the switch that caused the derailment was turned into the middle track while the train was passing over it. There was nothing to show that the switch was turned by the train itself. It might have been turned over by a movement of the lever in the tower or by someone moving the switch valves located near the track.

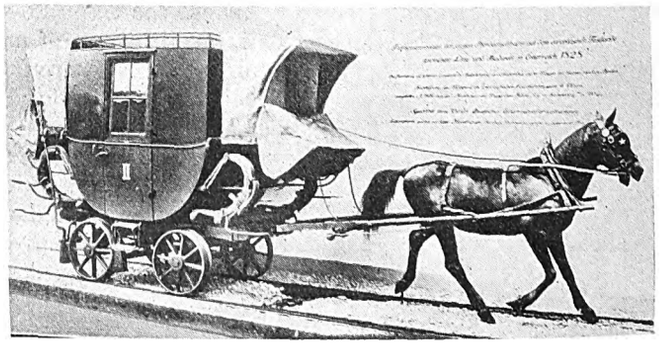
The switch that caused the derailment was not the switch which was out of order, but is the one that normally operated on the same circuit with the switch that was out of order. It would have been impossible to throw the switch while any part of a train was passing over it, except by a pushbutton in the back of the interlocking machine or by the switch valve.

The car that was demolished, No. 4503, was one of a series of cars built in 1916. It was of all-steel construction, being made of structural and rolled shapes. The drawings reproduced with this article show the principal dimensions of the car and particularly of the framing in the vicinity of the center side doors at the point where it was torn apart. It will be seen that while the sills are continuous from end to end the side plates are cut away to make room for the doors. Additional beams are riveted to the sills, being kicked down to give additional vertical stiffness and compensate for the discontinuous side plates. Another drawing shows the connection of the drawbar and coupler, which successfully withstood the enormous strain imposed when the car collided with the wall.



Elevation of the standard steel subway car of the type involved in the accident of Aug. 24

First Horse Car Line in Europe



Reproduction of full-sized model of first horse car on the continent of Europe

ONE of the exhibits now at the German National Museum in Munich is a full-sized model of a horse car built and used in 1828 on a line between Linz and Budweis in Austria, completed that year. This is said to have been the first horse car line in the continent of Europe. The model was presented to the museum by the German Railway Association (Verein Deutscher Eisenbahn Verwaltungen).

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Relation of Customer to Seller True Basis for Rate Structure

By Richard Sachse
Consulting Engineer, Los Angeles, Cal.

Mr. Sachse, in his article entitled "Determining the Proper Price for the Transportation Product," published last week, discussed in detail the many factors affecting rate making. In this article he cites three important rate cases to show the attitude of one state commission toward these various factors.—EDITOR.

RATE structures of mass transportation utilities should be based, primarily, not on distance, nor time, nor approximations of cost of various services, but on the relation, in regard to service taken and received, of the customer to the seller. Attempts to put into effect rate schedules built squarely on such a basis are still comparatively rare. It seems worth while, therefore, to review briefly three of the recent important California electric railway rate case decisions to show the attitude of one commission toward fare problems. These three important rate proceedings have for a year or more been before the California Railroad Commission. They concern the rates of the largest urban and interurban mass transportation utilities of the state: the Pacific Electric Railway, the Los Angeles Railway and the Key System Transit Company. In all three the question of the rate structure was a major issue. The commission in its several decisions reached certain conclusions and made certain pronouncements which may be of value to the entire industry and, whether there be agreement or disagreement, may assist in pointing the way.

Views of the California Railroad Commission on three important rate cases concerned many fare problems, including zone system versus city-wide fare, peak versus off-peak riders and flat rate versus reduced and special rates

The Pacific Electric Railway, with its interurban, suburban and city lines, both electric car and bus, serves the metropolitan area tributary to the city of Los Angeles, in San Bernardino, Los Angeles, Riverside and Orange Counties, including the cities of Los Angeles, Pasadena, Glendale, Riverside, San Bernardino, Redlands, Fullerton, Santa Ana, Anaheim, Long Beach and a number of others. This transportation system is a combination of large interurban and urban passenger lines and is one of the largest freight carriers of the state, with a total revenue in 1927 of $19,647,000. The Los Angeles Railway is the largest street railway system in California and one of the largest in the United States, handling more than 75 per cent of the Los Angeles local passenger traffic and operating a large fleet of buses in addition to its rail service. Its gross revenue in 1927 was $13,288,000. The Key System Transit Company combines an interurban ferry and electric train service between San Francisco and the east bay counties of Alameda and Contra Costa with a local street railway service in Oakland, Berkeley, Alameda, Richmond and other cities, supplemented by bus service. Its operating revenue in 1927 was $7,453,000.

These three mass transportation systems may be taken as representative of the industry, for they give almost all types of service. The Pacific Electric in its Los Angeles city service operates under a zone fare system; in its interurban service under a distance tariff at various unit rates per mile with an assortment of reduced rates for round trips, commutation, Sunday passes and other special trips. The Los Angeles Railway is on of the few remaining large systems with the flat 5-cent fare, including free transfers (no city zones). The Key System Transit Company also has a flat fare, 7 cents, except for a few of its longest lines in zoned suburban service. Its transbay interurban service is on a flat rate regardless of distance, with greatly reduced rates for monthly commutation tickets.

Each of the three systems found it necessary to apply to the Railroad Commission for increased fares. The Pacific Electric Railway and the Los Angeles Railway asked for a flat increase without a change in the rate structure; the Key System Transit Company asked for a new schedule of rates constituting a considerable departure from the rate forms then in effect. The main characteristics of the rate structures of the three systems as they existed at the time of the rate application and as proposed by each company are shown in Tables I and II, accompanying.

A discussion of the issues of these interesting rate proceedings before the California Commission is not within the purpose and scope of the present analysis. It is sufficient to say that in the Pacific Electric Railway case the commission established certain experimental rates which were modified somewhat in a later decision, and that provision was specifically made for further experimenting if deemed necessary or desirable. In the Los Angeles Railway case the commission denied the company's application for the specific rates requested and allowed no increase whatever, maintaining the 5-cent flat fare. The company's application for a rehearing was denied. This case has been taken into the federal court, the company alleging confiscation.

In the Key System case the commission made several decisions. Temporary emergency rates were first put into effect pending final decision. A year later, after submission of the entire case, the commission ordered for the street car lines an entirely new rate structure different from the flat rate and different from the rates applied for by the company. On the interurban lines the

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commission reduced the rates. The company refused to accept these rates and asked for a rehearing on the ground that the rates ordered by the commission would reduce the income annually by more than $1,000,000, compared with the then existing fares, instead of providing for an increase in net income of approximately $1,000,000, which increase was reasonably required according to the finding of the commission. The rehearing was granted and a later decision annuls and modifies the former order. Table III shows the rate structures of the three companies in accordance with the latest decisions of the commission.

In the Key System case the California Commission in its decision dated Nov. 9, 1927, made certain findings of fact on rates and rate structures. The commission said:

> Past horizontal fare raises have successively proved insufficient to meet the financial requirements of applicant and it appears reasonable to conclude that the remedy, at the present time, cannot be found by the granting of a further horizontal increase in fares.
>
> The basic 5-cent fare on street car lines has many meritorious advantages and a serious attempt should be made to develop a fare schedule built upon the basic 5-cent fare that will meet the reasonable financial requirements of the company.
>
> Sufficient accurate and dependable data as to the exact form of satisfactory rate schedules for applicant are not available and that, to secure such information, extensive experimentation should be made in the form, kind, amount and spread of rates for various services of applicant, and any such experimental rates established should be subject to prompt change or elimination whenever it becomes apparent that they are unsatisfactory or against the public interest.
>
> The earnest and aggressive use of modern merchandising methods on the part of applicant is essential to the success of any fare plan.

On the above basis the commission ordered "as an initial experiment, rates based upon a modification of the plan tentatively recommended by the commission's chief engineer" and substantially as follows: a zone system for the company's street car lines with a 5-cent zone fare in each individual zone and a 10-cent through fare in two or more zones. In addition, two weekly passes were ordered and a reduced individual off-peak rate, good between 9 a.m. and 4:30 p.m. every day in the week. On the interurban transbay lines the one-way fare between San Francisco and any point in the east bay territory was reduced 1 cent, from 21 cents to 20 cents (the company had asked for a 25-cent fare), and a modification in the form of the commutation ticket was made with a slight increase in the rate.

The company asked for a rehearing, stating that the experiment ordered by the commission would result in such a reduction in gross revenue that it would, in the opinion of the company, precipitate its system into bankruptcy. The commission granted the rehearing and modified its first decision, stating in its opinion and order of May 29, 1928, that there was little hope for success with such fares unless the company tried them out wholeheartedly. Since the company believed that the risk was too great in view of its financial condition, the experimental fares could not be considered. Since the decrease of expenses had already been considered the commission confined itself with the possibility of further increased revenue.

The commission then discussed at some length several possible rate structures for the street car lines, including the 5-cent zone fare, the 5-cent zone fare with the $1 weekly pass, the 10-cent flat fare with the $1 weekly pass, the 10-cent flat fare with reduced token fare and $1 weekly pass, the 10-cent flat fare with reduced token fare and $1.25 weekly pass. It finds that there are serious objections to each. The discussion of rate structures is concluded with a reference to the statements of several electric railway operators who testified specifically against the experimental fares proposed and in favor of the fares proposed by the company. Under this record and the conditions stated the commission felt that to order any of the forms of fare proposed in the previous order would be in the nature of questionable experimenting with a situation extremely hazardous both to the applicant and to the public. Accordingly the matter was left open for further order until the company may petition the commission to file fares which it believes will most nearly meet the exigencies of the situation.

TABLE I—RATE STRUCTURES AT TIME OF APPLICATION TO COMMISSION

	Interurban Service	Local Service
Pacific Electric Railway	Mileage rate, from 0.9 cents per mile for commuter tickets to 2.75 cents for one-way fares	Through fare of 10 cents, 6-cent zones and free transfer
Los Angeles Railway	None	Flat rate of 5 cents and free transfer
Key System Transit Company	Flat rate of 21 cents for one way and $5.20 for monthly commutation	Flat rate of 7 cents and free transfer, no zones

That the commission gave much attention to the problem of a proper fare structure in this proceeding is clearly apparent not only from the decision of the majority, but also from the two minority opinions accompanying the decision. Commissioner M. J. Carr in his "Opinion Concurring in Part and Dissenting in Part" discusses the matter quite fully. While he was in general agreement with his associates he was not in entire accord as to the nature of the relief or the kind of order which should be made. The important point, he felt, was, "can any system of fares having some semblance of fairness between classes of riders be devised which will make it possible for this company to exist and to continue to serve the great population tributary to its lines?" Whether or not a fare is justified on paper and in theory, it is futile if the public will not ride. To a very large extent the riding public fixes and determines the rate of fare. In a footnote Commissioner Carr says:

TABLE II—RATE MODIFICATIONS APPLIED FOR

	Interurban Service	Local Service
Pacific Electric Railway	Increase of 20 per cent for existing rates	Various changes contemplating approximately a 20 per cent increase
Los Angeles Railway	None	Cash fare of 7 cents, 6½-cent token, 6-cent interim fare, free transfer and universal transfer (good on two systems)
Key System Transit Company	Flat rate of 25 cents for one way and $6.50 for monthly commutation	Cash fare of 10 cents and a $1 weekly pass

> Here the commission is in effect rendering a judgment against one class of riders, namely, the commutation riders, and in favor of the casual or occasional transbay rider. The issue as to which of these two classes should be required to bear an increased burden really has not been tried out in the course of the proceedings, the record being surprisingly barren of testimony or discussion to aid in reaching a correct conclusion. This situation illustrates concretely what I sense is a serious defect in regulation of rates by the commission. A rate case is fully presented and the commission reaches a sound and well-supported conclusion that revenue should be decreased or increased as the case may be. The question then arises as to the class of persons to secure the benefit or suffer the detriment. While the patrons of the utility theoretically have a hearing practically they do not.

This commissioner disagrees that a commission should assume complete management in the matter of prescrib-

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ing a specific rate schedule. He held that while he was in entire accord with his associates in the premise that competitive and economic conditions will determine largely the level and kind of fares, it is logical that where a company is not earning a reasonable return it should be given some latitude in establishing new fares which it believes will yield it something of a return under the existing conditions. There is nothing unfair or unreasonable in the casual or occasional rider paying more than the regular rider. Whether the fare structure will work is a very different question. The company claims it will. Its success or failure depends largely on the way it is received by the public.

Commissioner Carr further stated that he agreed with Commissioner Seavey that any trial fare structure to which the company is opposed is almost certain to fail, as it would not receive a fair trial. In view of the uncertainty of the results of such a structure he did not believe the commission would be justified in issuing a mandatory order requiring it.

A quite different view was held by Commissioner E. W. Decoto, who said it seemed clear to him that there is no fare proposed or that could be devised at the time that would yield a greater gross revenue than that in force. The company cannot compete with the privately-owned automobile or with buses or with the tendency of the people to leave street cars, by raising the cost of street car travel. He believed that little could be learned by further study, so that he held that the fares should be definitely fixed at 7 cents and the case closed. In this view a company should not be permitted to go above a certain fixed rate (7 cents in this case) regardless of the utility's belief that a higher fare or a different rate structure will produce greater revenue and better service. Should such a view prevail it is clear that the effective management of the utility would definitely pass from the owners to the commissioners.

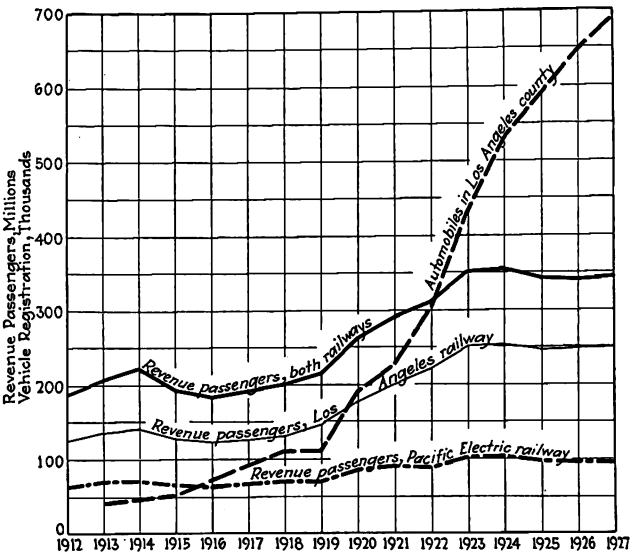
TABLE III—PRESENT RATE STRUCTURES, ORDERED BY THE CALIFORNIA RAILROAD COMMISSION

	Interurban Service	Local Service
Pacific Electric Railway	One-way fares of 2 cents per mile on certain heavy lines and 2.75 cents per mile on all other lines, round-trip rates 5 cents less than double the one-way fare of not more than 25 cents, and 10 cents less than double the one-way fare of 30 cents and more, reduced rate 30-ride, 90-day family ticket, 60-ride, 40-day individual ticket, $9 monthly pass on large part of system, $2.50 Sunday pass and minor rate provisions.	In Los Angeles four 5-cent zones with 10-cent and 15-cent through zone fares and 25-cent round-trip fares; in other cities 5-cent one-way fare where prior rate was 6 cents, and 10 cent one-way fare where prior rate was more than 6 cents
Los Angeles Railway	None	Flat fare of 5 cents with free transfers. (No increase; application denied.)
Key System Transit Company	Flat fare of 21 cents for one way and $6.50 for monthly commutation	Flat fare of 7 cents, free transfer

That the California Commission is much impressed by the advantages of the nickel fare is further apparent from its decision dated April 7, 1928, in the Pacific Electric case. The local fares, prior to that decision, in the cities served by the Pacific Electric were generally above 5 cents.

The commission says:

An increase in the local fares in the cities of Long Beach, San Pedro, Santa Monica, Venice, San Bernardino, Riverside and Glendale would result in little, if any, increased gross revenue, and the requested increase in these rates should be denied. These operations, however, are relatively unimportant and it is recommended that such fares be placed on a 5-cent basis to be consistent with the interurban fare schedules.



Annual revenue passengers carried by electric railway lines serving Los Angeles and automobile registrations for a period of fifteen years, showing the effect the increasing use of automobiles is having on street car patronage

Referring to the company's local service in the city of Los Angeles the decision contains this statement:

A serious problem is presented with respect to the fares on the local rail lines of applicant in Los Angeles. The record indicates that a total increased revenue of some $250,000 annually is required to yield a fair return on this property. The evidence further shows that the company's requested increase of zone fares to 7 cents and 12 cents, respectively, will not only fail to return any additional gross revenue, but, it is estimated, will actually result in a decrease of nearly $60,000 under present revenues. Such a result is obviously not in the public interest and the request should be denied.

Three zone plans are proposed by our chief engineer. The only one which appears to be adequate to return the increase in revenue desired is the so-called four-zone plan, consisting of one 15-cent zone, three 10-cent zones and four 5-cent zones. This plan, it is estimated, will result in an increased revenue of $200,000 annually, or $50,000 less than the required additional revenue. There appears, however, to be no other form of fare which will return to the company a greater increase in revenue. This form of fare will have the advantage of abolishing the present objectionable odd coin fare of 6 cents in Los Angeles. I believe the adoption of such a fare schedule is the most satisfactory disposal of the Los Angeles local situation and the accompanying order will so provide.

In the Pacific Electric case, as in the Key System case, the commission was in favor of rate experimentation along the lines recommended by its chief engineer, A. G. Mott, who proposed (1) an extension of the Glendale trial rates to other portions of the system; (2) the trial of a low one-way off-peak rate; (3) the trial of a monthly pass, and (4) the trial of a Sunday excursion pass. Only in this way, the commission stated, can it be determined with finality whether there is any merit in such experimental plans. These fares should be inaugurated for a trial period, and should they prove unsatisfactory the necessary adjustments should be made.

The effect of conclusions based upon the information at the commission's disposal is most clearly shown in the Los Angeles Railway rate case decided in April, 1928. In that case the California Commission denied the company's application for an increase in the flat 5-cent fare notwithstanding the fact that upon the commission's own computation and on the commission's own valuation and rate base the company was earning a return of less than 5 per cent and had been earning between 5 and 6 per cent of the commission's own figures since 1924. That the matter of rate structure was an

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important consideration in the commission's mind is apparent in the concurring opinion of Commissioner M. J. Carr, who says:

> This is the second time this company has sought from the commission authority to depart from the basic 5-cent fare which, with inconsequential exceptions, has prevailed on its Los Angeles system for many years, and to enter upon the uncharted sea of multi-coin fares. . . .
>
> This company occupies the streets under franchises, most of which call for a 5-cent fare. While such fare provisions are subject to change by the state in the exercise of its police power, agreements of this character should not be brushed aside or ignored in the absence of clear and convincing evidence that adherence to them will work grave injustice to the company. Particularly is this so in view of the many advantages of the basic 5-cent street car fare as contrasted with serious objections both in respect to service and financial results that seem to be attendant upon a multi-coin fare structure.

In a footnote this commissioner indorses the conclusions of the commission's chief engineer and says:

> Mr. Mott, chief engineer of the commission, spent about six weeks in other sections of the country studying street railway conditions. Testifying here after pointing out the confusion flowing from multi-coin fares and basing his testimony upon his extensive study and investigation, he added:
>
> "Another feature that has impressed me is that in most cities that have departed from the single coin fare of 5 cents, subsequent revenues have continuously diminished to such a degree that results of operation ultimately have often been nearly as unsatisfactory on the higher fares as they were on the 5-cent fare. It may be that there is no logical stopping point between the 5-cent fare and the 10-cent fare."
>
> Later in his testimony, after referring to the experience of the Key System Transit Company in securing a much smaller increase in revenue than expected from an increase in fare from 6 cents to 7 cents, he stated:
>
> "With that situation in mind, together with the fact that in most of the Eastern cities where they have these multiple-coin fares the system is not a success financially, I could not help but conclude that there must be some inherent merit in the basic 5-cent fare."
>
> This testimony throws grave doubt upon the permanency of any increase in revenue due to horizontal increases in fare and as to the beneficial effect of any such increase upon the financial status of a street railway company.

This quotation makes it evident that it would be of greatest moment, at least to the California mass transportation systems, if an authentic study were available showing whether these deductions and conclusions are sound and based on fact, or whether they are wrong and based on surmise and insufficient or erroneous information. The writer is satisfied that the facts are altogether different and the conclusions unsound. If the facts were as stated and the reasoning were good there would be little or no hope for the mass transportation utilities. Fortunately, it can be demonstrated beyond doubt that the controlling things are the service and not the nickel fare; a reasonable, workable rate structure and not the presence or absence of the multi-coin rate. But the commissions do not and cannot know these facts unless they are properly and convincingly informed. And the information must come from the utilities themselves.

A study of court and commission decisions in other states show similar difficulties. Too much attention undoubtedly is given in rate cases to the theories of conflicting methods of valuation and depreciation, of obsolescence, going concern, development cost and similar moot questions. Too little time and thought is spent by the mass transportation utilities on the more acute and important realities of the manner and kind of price of our product and means and ways of how best to dispose of that product and to whom. These are the problems of rate structure and of selling. And it is very necessary that these controlling elements receive adequate attention in all rate cases.

Munich Becoming Active as an Electrification Center

LINES of the German State Railways in the southern part of that country are in particularly favorable position for electrical equipment because of the abundance of water power. One of the latest sections to be equipped electrically is that between Rosenheim, Bavaria, and Salzburg, Austria. This permits through electric operation between Munich and Salzburg, as the section between Munich and Rosenheim had already been equipped.

Bavaria now has under electric operation 440 miles of route with about 940 miles of track. Power is purchased from a large hydro-electric system. A 110-kv. transmission system, about 250 miles long, owned by the railroad, supplies power to four substations—in Pasing, Landshut, Murnau and Rosenheim. The combined transformer capacity is 50,000 kva. The present system requires somewhat over 100,000,000 kw.-hr. of energy annually. With completion of the generating plants that are supplying power the combined single-phase capacity of the system will be increased from 60,000 kw. to more than 80,000 kw., with a potential annual output of 250,000,000 kw.-hr.

In view of the form of contract it has made with the power system, the railway plans to extend electrification further on lines that warrant a fair return on the investment, in order to obtain the maximum benefit from the use of the power available. The first line contemplated for conversion is that between Munich and Stuttgart. This carries heavy passenger and freight traffic, and also is in competition with the parallel line through the Tyrol, Vorarlberg and Switzerland. The latter route already is operated electrically as far west as the French frontier at Basle.

It is understood that the western continuation of the German line beyond Stuttgart as far as Kehl, near Strassburg, will also be electrified, probably in connection with the electrification of other trunk lines in the states of Baden and Württemberg. Electric power will be supplied from hydro-electric plants in the Black Forest and a station projected on the Rhine River between Lake Constance and Basle. The German State Railways has recently acquired a partnership in this enterprise.

The German reports regarding the electrification projects lay great emphasis on the economies to be obtained. It is claimed that the annual fuel saving for the Bavarian electrification already installed amounts to 140,000 metric tons of coal per year. Coal is rather expensive, as the nearest mines are in northern Germany. The saving in locomotive and shop crews, due to electrification, is estimated at about 600 men. For most of the local service, one man is assigned to each locomotive, although the train conductor rides in the cab to be available in emergencies.

In addition to the electric locomotives in the Bavarian district, mentioned in a previous issue of this paper, a number of multiple-unit cars are coming into use. These are being used in suburban service, replacing trains formerly hauled by light electric locomotives. The usual make-up of the train includes a heavy motor car with a continuous rating of 500 hp., a trailer with complete control equipment, and two to four light-weight trailers between. The latter are of the same type as used formerly in steam service.

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Chartered Bus Business Increasing at Louisville

By G. B. Powell,
Bus Manager Louisville Railway, Louisville, Ky.

ENCOURAGED by the fact that more than 31,000 miles of chartered bus business was done during 1927 by the Kentucky Carriers, Inc., bus subsidiary of the Louisville Railway, Louisville, Ky., the company has recently increased its equipment. Two specially built de luxe parlor car buses have been purchased to take care

Comfortable seats, full headroom, parcel racks and carpeted floor are features of the interior of the new buses

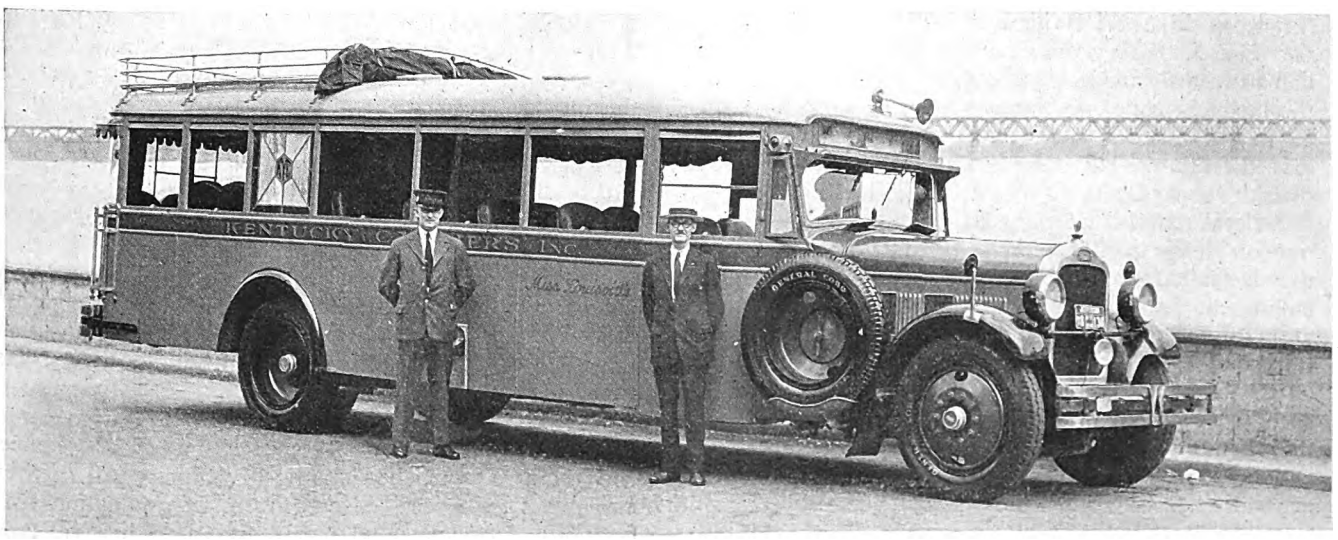
of the expanding volume of business of this character. The buses are of the White model 54 type, and are equipped with engines developing in excess of 100 hp. The bodies were especially designed for this particular job and were built by the Bender Body Company of Cleveland, Ohio. Many features making for passenger comfort and convenience have been incorporated in the construction, such as 76-in. headroom, 16-in. aisles, double-spring and air-cushioned seats, specially shaped seat backs upholstered in leather, carpeted floors, lavatory, ice water fountain, baggage compartment, parcel racks over the passenger's heads, with an additional compartment over the rear wheel housing for heavy baggage, and electric fans. Seats are provided for 26 passengers but on short trips the number can be increased by means of folding seats to accommodate a total of 30.

The company is now operating one-day excursions each Sunday and holiday to local points of interest within a radius of 100 miles. During the summer months eight-day vacation tours are operated to such distant points as Washington, D. C., Green Bay, Wis., Asheville and Chattanooga. It is also planned to operate an extensive southern tour every two weeks during the coming winter. The buses are available for charter for special trips at any time when not otherwise engaged.

Detroit Extends Its High-Speed Express Service

WITH the inauguration of an express railway line on Grand River Avenue the City of Detroit Department of Street Railways has taken another step in its plan for providing high-speed transportation on its streets. Effective Sunday, Aug. 19, 1928, this plan, the value of which had been so effectively demonstrated on Jefferson Avenue during the past year, has been extended to another section of the city. Street cars now run express on Grand River Avenue between Henry Street and Joy Road, a distance of approximately 4 miles, with only eight stops, local passengers between these points being served by a newly-established bus line. The cars run local from the center of the city to Henry Street, a distance of 1 mile, and from Joy Road westerly to the end of the line, the safety zone stops in these sections being about three blocks apart. Canvas canopies shelter waiting passengers at the express stations, which are located at Henry Street, Temple, Trumbull, Buchanan, Fourteenth, Warren, McGraw Avenues, Grand Boulevard, Quincy Avenue and Joy Road. These shelters are similar to those on Jefferson Avenue, which were illustrated in this paper, issue of Jan. 7.

Under the new schedule on Grand River Avenue the passengers may now ride in a street car from Joy



One of two de luxe buses recently added to the fleet operated by the Kentucky Carriers, Inc., at Louisville

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Road to the City Hall, approximately 5 miles, in nineteen minutes. The actual running time over this section prior to starting the express line was 27 minutes. All Grand River line patrons west of Joy Road receive the full benefit of this cut in running time and patrons who board the local buses at stops between express stations are being urged to transfer to the cars at the nearest station in order to avail themselves of the time-saving feature. The faster running time makes possible a saving of four cars in the base and ten on the peak schedule.

The new service is to be effective on week days only from 5:30 a.m. to 9 p.m., the cars being run local all the way at other times, including Sundays and holidays. Signs giving the periods of express and local service are placed at all safety zones along Grand River Avenue at which the cars do not stop during the express service period. These signs advise passengers to board the transfer buses at the curb.

Express Cars Automatically Get Right of Way

With the co-operation of the traffic division of the Detroit police department arrangements have been made for the installation of contactors on the trolley wire governing the control of the automatic traffic signal lights which are located at various points along the route of the express cars. By means of this device the express car, upon approaching the traffic light, automatically throws the signal in its favor. The contactor is installed far enough away from the crossing to change by the time the car has reached the intersection at its normal speed. The lapse of time also eliminates any hazard that might exist if the signal were to be changed suddenly without allowing time for vehicles to clear the crossing. A contactor on the opposite side of the intersection causes the light to be returned to its regular automatic control when the car passes beneath it.

The auxiliary local bus line between Henry Street and Joy Road is equipped with 15 buses of 29-passenger capacity. These buses have been completely overhauled and are painted in ivory and green, the new standard color scheme for buses adopted in Detroit. By using 29-passenger buses, instead of the 21-passenger buses which are used as auxiliaries on the Jefferson Avenue line, the principal objection to the use of transfer buses, that of overcrowding, has been removed.

Express operation was first inaugurated in Detroit on the Jefferson Avenue line on Sept. 28, 1927. An article on this service appeared in the issue of this paper for Jan. 7, 1928. Cars on the Jefferson Avenue line had previously made about six stops to the mile outside the business zone and the average speed did not exceed 12 m.p.h. Under the express arrangement stops were spaced from one-half mile to 1.16 miles apart, and speed over the express section was increased to 18 m.p.h.

Several months after the inauguration of the express line on Jefferson Avenue the traffic survey bureau of the Detroit Police Department conducted an inquiry among the owners of private automobiles and the operators of motor trucks who were in the habit of using this street, with the view of determining their opinions as to the practical benefit of the new arrangement in speeding up traffic and relieving congestion. The great majority of those who replied to the questionnaire endorsed the new plan and were agreed that conditions generally had been much improved. Some of the replies were quoted by the Journal in the issue of March 3, page 358.

L.G.O. Controls More Than 5,000 Buses

SOME interesting figures on London bus traffic were elicited at a recent hearing in London before a joint commission of Parliament to consider railway bills. They include statistics of the associated companies of the London General Omnibus Company, as well as the L.G.O.

It is well known that during the past two or three years the interests connected with the London General Omnibus Company have obtained control of a number of other omnibus companies operating for the most part within the London County area. The capital issued and outstanding of all of these companies, but apportioned only where a part of the company has been taken over by the underground group, is £9,076,445; additional expenditures not yet represented by issued capital, £1,947,989; total £11,024,434.

Equipment taken over in the merger includes garages in occupation or under construction, 73; garage capacity in omnibuses, 5,467; number of omnibuses owned and operated, 5,226; number of road-miles covered within the London traffic area, 1,459; outside of that area, 232; total 1,691 miles.

Number of routes or sections of routes worked, 512; number of bus-miles run in 1927 (not including two companies recently acquired), 195,734,163; number of passengers carried in 1927 (not including the two companies already mentioned) 1,698,940,235.

Frank Pick, managing director of the Underground group, which controls the L.G.O., said that in 1927 about 30 per cent of the bus routes operated paid no profit over operating expenses and depreciation. On these routes 190,000,000 passengers were carried, or about 11 per cent of the total number of passengers. Nevertheless, as a whole the business was profitable and the company paid last year a return of 7 per cent on its capital.

Most of the traffic carried by the buses was short-distance service—that is to say, 57 per cent of it was for 1 mile or less where the fare was only 1d. (2 cents). The average fare paid on the omnibus was 1.18 pence. Since 1917 omnibus traffic has increased 148 per cent, subway traffic 24 per cent and tramway traffic 25 per cent.

First Aid Saves Lives in Chicago

LIVES of eight persons have been saved by employees of the Chicago Rapid Transit Company, Chicago, Ill., as a result of the first-aid training under the supervision of the medical department, according to figures just given out by Dr. Hart E. Fisher, chief surgeon. Five of the persons saved were in no way connected with the organization, and their lives were saved at places removed from company property. Nine "L" employees have been awarded medals in connection with the saving of these lives, two being honored in one case. Their exploits include resuscitation from drowning, electrical shock and other accidents. In addition, 24 other Rapid Transit employees have received medals for outstanding demonstrations of ability to meet emergencies.

A total of 2,277 Rapid Transit employees have completed the first-aid training course since this organized activity was established on the "L" lines. All of these employees have received certificates of graduation from both the American Red Cross and the Chicago Rapid Transit management.

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Making Modernization the Goal

Many improvements can be made to existing rolling stock to increase patronage and so eventually to obtain revenue needed for the purchase of new equipment

By A. B. Gibson

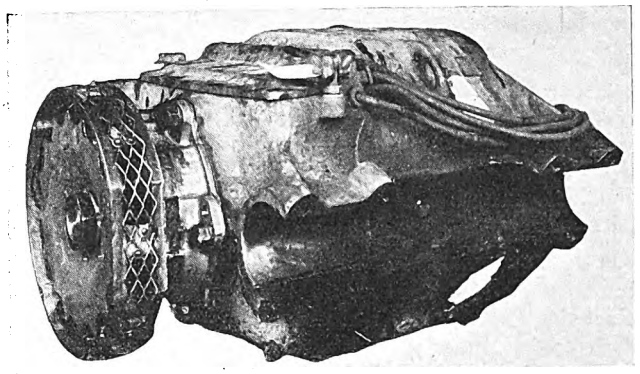
Traction Apparatus Section Head
Westinghouse Electric & Manufacturing Company

WE IN the electric railway industry are today engaged in an extensive program of modernization. The public is demanding that transportation facilities keep pace with the general advance of society in the perfection and use of those conveniences which make living easier, more rapid and more luxurious. A period of unprecedented social prosperity is here.

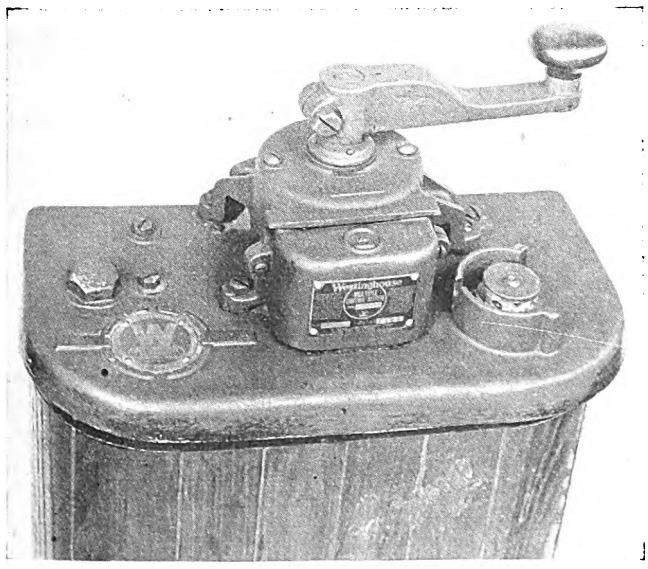
The electric railway is affected perhaps more than almost any other branch of transportation, as the public comes into contact with the street car most frequently. The rapid development of motor buses, with their modern appearance, flexibility of service and easy riding qualities, combined with the general demand for something new, has made it desirable and necessary that the electric railways include them in their service. The private automobile, with its appeal of luxury, individuality and speed has come into such common use in our large cities and suburban communities as a form of daily transportation that it is now perhaps the greatest competitor of the electric street car.

To help in meeting this growing competition the electric railway industry has turned to the builders of cars and car equipment for a street car which incorporates most of the advantages of the private automobile and motor bus but which, at the same time, retains the fundamental advantages of the street car for mass transportation. The street car presents no parking problems and renders a service the reliability of which has been hard to equal either by bus or private automobile.

The manufacturer has met this demand by numerous new cars having deep, comfortable upholstered seats, wide-vision windows, streamline bodies, smoothly running trucks, and luxurious, well-illuminated interiors. New types of motor drive have been developed incorporating double-reduction gears running in oil and the worm-auto type of drive. New high-speed motors for these new drives have been designed, anti-friction bearings have been employed, and improvements have been made in the design of electric control apparatus. These new developments make possible more rapid acceleration, and higher speed service along with the luxury and comfort demanded by the American public. These combined new designs have made it possible for the street car again to compete for a larger share of our city and suburban transportation patronage.



External fans have been developed to provide ventilation for types of motors originally without it. The illustration shows a Type 306-CA motor with external fan



The TA handle switch when placed on K controllers using a line switch reduces burning of fingers and segments

The next problem before the industry is to obtain the necessary capital to purchase new cars and make possible the retirement of those now in service. In some places the money is available for such a program. Fortunate are those who are in such a position, because the new modern car is, without question, the best avenue to increased revenue and decreased operation and maintenance costs.

But what are those to do who have not the necessary capital for such a step? This is the question which confronts a large number of operators at the present time. To these the possibilities of modernization of the equipment already in service offer the first and best alternative. The progressive manufacturer has not been blind to this necessity, and numerous avenues have been opened for incorporating in the equipment now in service many of the advantages of the most modern design.

Cars can be redecorated and repainted, new and more comfortable seats can be installed, the lighting can be improved and numerous other improvements can be made

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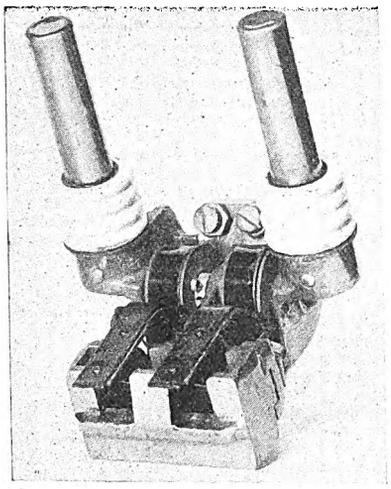


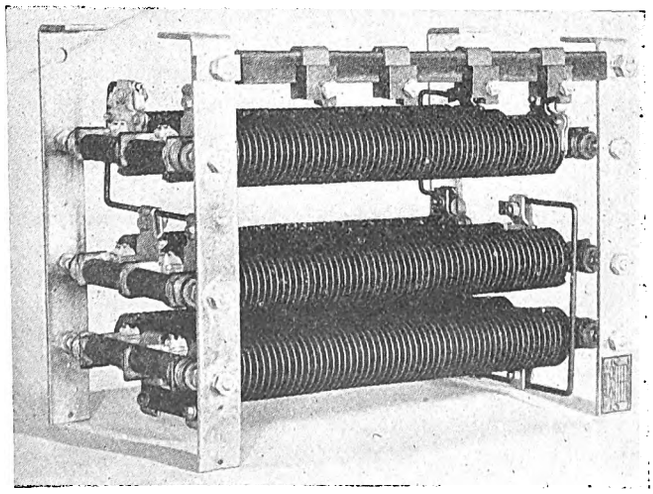
Scrapping the entire brush-holder when the box is worn out is unnecessary with this detachable box type brushholder

to the electrical equipment which permit higher speeds and lower operating and maintenance costs. External fans have been designed for the non-ventilated types of motors which make possible from 36 to 50 per cent increase in capacity. Newly designed square wire armature coils to replace the round wire coils have made from 10 to 12 per cent increase in capacity on either ventilated or non-ventilated motors. Installations of these have made possible marked improvements in acceleration and speed of old cars. Change in gear ratio to meet present conditions also is helpful.

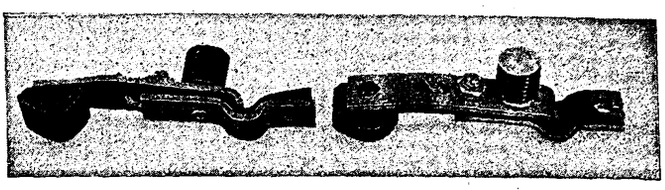
The development of oil-sealed lubrication of armature and axle bearings for old motors has made it possible to show a marked decrease in cost. Improvements have been made in brush-holding design incorporating the detachable box brush-holder feature and twin washer brush-holder finger mechanism.

The adoption of dual ventilation to certain ventilated motors in service has resulted in marked reduction of commutator and brush wear and has shown improved commutation. The greater part of the improvements made in recent years in the construction of unit switch control have been so designed that they can be incorporated in the old equipment at a moderate expense. New contact fingers have been developed for use in drum controllers which result in longer life and improved operation.

All these and many other improvements are possible on the old car equipments now in operation. The regular overhaul period for cars affords the best opportunity for incorporating them in old cars. By such a program the progressive operator may obtain a large part of the advantages of new designs. Those who are following out such a program have noted marked results toward again securing the patronage of the public such as they enjoyed a few years ago.



The Type M resistor, as used in railway service, only weighs a third as much as the corresponding grid resistor and the units are less liable to break



The compensating controller finger insures maximum contact at all times and compensates for worn, burned and irregular drum segments

Modernization is the goal of the electric railway industry today. It is needed if the industry is to retain its present patronage and to win back much of that patronage which has been lost during recent years. This can be accomplished most effectively by taking advantage of all the opportunities for improving service which are afforded and which can be accomplished by rehabilitation.

The Readers' Forum

Reason for Surface Car Trains in Europe

KÖLN, GERMANY, Aug. 23, 1928.

To the Editor:

American managers may not understand the reason in some large European cities for the large number of center-entrance cars, necessitating two-man operation. In the smaller towns one-man cars have been quite common, some having been in use since before the war. But with our narrow streets, long cars are not practicable, so that a great deal of the traffic is hauled in the larger cities by two-car and three-car trains, and in suburban service by four-car trains. On these trains the average number of men per car is not two but 1½, 1⅓ and 1¼.

There is also another good reason for not using more one-man cars in large cities. Our stops are much farther apart than in America and average only from 4 to 5½ per mile. That means that more people board cars at each stop, and with one-man operation, too much time would be taken at the stops if passengers had to pay their fares to the operator while boarding. With center entrances, also, lower steps are possible.

For suburban service center-entrance cars have the additional advantage that the front end can be separated from the rest of the car by a bulkhead. This permits the reservation of space, or a compartment if desired, not only for the motorman but for luggage, including market baskets.

The reader may be interested in the following figures on the number of passengers hauled in Köln recently at a large assemblage of gymnasts. About 350,000 attended from all parts of Germany, America and other countries. On Sunday, July 29, the principal day, the Köln Street Railway System handled from noon, in one direction to the stadium, on one track of a double-track line, 221,000 passengers with three-car trains. From 1:30 to 5 p.m. 150 trains of this length were run per hour in each direction, carrying 33,000 passengers per hour. In the evening, after the exhibition, the same crowd had to be taken back. Compared with this number, it is estimated that 17,000 people traveled in 5,664 automobiles.

R. SCHWANTER.

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F. J. Martin Wins August Maintenance Prize

The judges in *Electric Railway Journal's* Maintenance Contest award the monthly prize for August to F. J. Martin, superintendent of maintenance for the Pittsburgh Railways, Pittsburgh, Pa., for his description of the combination air compressor and street crane used by that company in track construction work

ONE of the handiest pieces of maintenance equipment used by the Pittsburgh Railways is a machine which can travel under its own power, lift heavy pieces of trackwork, and supply compressed air for the operation of compressed air tools used in track construction work. This unit has rubber-tired wheels and can travel at a speed of 20 m.p.h. It carries a 7 ft. crane, having a pneumatic hoist, and can lift 2½ tons. It provides an effective and safe means for moving trackwork and lifting rail into and out of the track area.

The machine is equipped with a compressor which has a capacity of 110 cu.ft., and can supply air for operating two of the latest-type concrete breakers. With this piece of equipment the work is done more economically and quickly than before. Track gangs are able to move to various locations, start and complete two or more minor repair jobs in a nine-hour day with less men that they used formerly.

This equipment was described by F. J. Martin, superintendent of maintenance for the Pittsburgh Railways, and entered in ELECTRIC RAILWAY JOURNAL'S maintenance contest. It provides a handy labor-saving tool for trackwork that has resulted in real economy for the company.

MORE NEW IDEAS WANTED

While this is the last of the monthly prizes to be awarded it is to be hoped that the practice of sending in maintenance items for publication will continue. The contest has brought to light many short cuts in maintenance practices which are very ingenious and new to most of the industry. There still are many other good methods that have not been sent in, and about which little is known. That a great wealth of ideas in practical maintenance for reducing costs and labor exists in the industry has been brought out by the maintenance contest. It has also served to show the need for interchanging practices with other properties throughout the country.

In the contest a total of nineteen prizes totaling $750 have been awarded. These were given to men connected with railways in all parts of the United States and Canada. Three men received two prizes. They were A. Taurman, Birmingham, Ala.; James A. Duffy, Fairmont, W. Va.; and Charles Herms, San Diego, Cal. The number of items sent in concerning shop practices was much greater than for other departments. Maintenance of overhead lines, tracks and buses offer a fertile field for more material of this character. The JOURNAL will continue to pay $5 each for maintenance ideas submitted and accepted for publication. If department heads will discuss this with their various maintenance foremen, several ingenious methods and devices undoubtedly can be uncovered.

The sending in of this material does not entail a great amount of labor. A photograph can be taken or a rough sketch made illustrating the construction and operation of the device or method of carrying out an unusual maintenance practice. Instead of considering the description as an article, a letter can be written telling about this. This can be in long-hand where a typist is not handy. Sketches may be in pencil or blueprints may be submitted, if drawings have already meen made. Sketches do not need to be finished drawings, but only sufficiently complete so that they will illustrate clearly the construction or operation of the device. The material should be mailed to ELECTRIC RAILWAY JOURNAL, 10th Avenue and 36th Street, New York City. Just send in a clear description of your method or device and the JOURNAL editors will do the rest.

F. J. Martin

THE electric railway experience of F. J. Martin, superintendent of maintenance Pittsburgh Railways, who was awarded the monthly maintenance prize for August, has all been with that company. He was born in Pittsburgh and while attending grade school entered the service of the Pittsburgh Railways during his vacation period, in 1909. After leaving high school in 1916 he became night receiver for the transportation department, and served in that capacity until the late war. After returning from service he was made dispatcher, holding the position until 1919, and then was transferred to assistant division superintendent and was promoted to be supervisor in 1920. During this time he took a four-year course in electrical engineering, and in 1926 was promoted to the position of superintendent of maintenance, which position he now holds.

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Maintenance Methods *and* Devices

Simple Construction for Pit Wheel Grinder*

By John Gerson
Assistant Engineer South Carolina Power Company, Charleston, S. C.

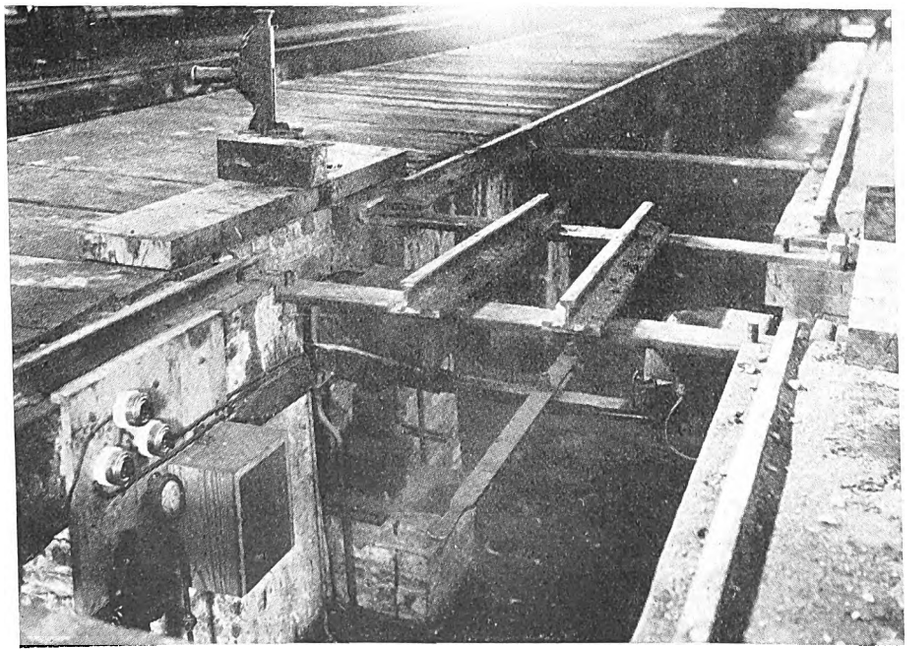
SMALL electric railway properties usually have a definite limit to the expenditure that can be made for shop equipment. One of these was the South Carolina Power Company, and in order to eliminate flat wheels a pit wheel grinder was constructed at low cost by using parts which were already on hand.

Two brake cylinders were set in brick foundations. The pistons of these were connected by a fixed beam. On top of this was a movable beam, and on each end of the latter was mounted a small compressor motor. Grade Q emery wheels, 16x1 in., grain 20, are mounted on the compressor motor shaft to do the grinding.

The grinding wheels, together with the motors, are raised and lowered by the brake cylinders. Air pressure for these is controlled through a motorman's standard brake valve, which is mounted on a board in the pit. This board also contains a circuit breaker and switches for controlling the compressor motors. A special trolley wire above the track has in series a high resistance to limit car wheel driving speeds. To provide sidewise movement of the grinding wheels the movable beam slides on the lower one. Movement is produced by a lever mounted on the fixed beam and secured to the movable one. The beams are curved to such a radius as will give a taper of 1 in 20 to the surfaces of the car wheels, dressed by the grinding wheels.

The cost of the grinder was $112, and it saves $2.65 per pair of wheels over the old method of ginding previously used by this property. A 2-in. flat spot is ground out in about fifteen minutes, and an additional fifteen minutes is required for jacking. The cost of grinding a pair of wheels, including labor and material, averages $1.35.

*Submitted in Electric Railway Journal *Price Contest.*

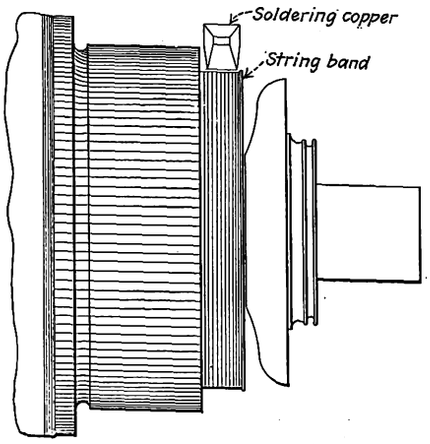


Pit grinder used in the shops of the South Carolina Power Company

Polished Surface for String Bands Reduces Flashing*

By Charles Herms
General Foreman San Diego Electric Railway, San Diego, Cal.

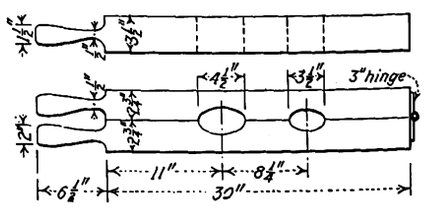
STRING band failures have been eliminated on armatures of the San Diego Electric Railway, San Diego, Cal., since an improved method of insulating these was adopted in 1925. The V-ring at the end of the commutator is given a coat of orange shellac and then the band is applied as usual. The band is then given four heavy coats of orange shellac, each coat being ironed in with a hot soldering iron. This gives a smooth surface to the band, and the naturally fluffy texture of the string is changed so it becomes a homogeneous mass and will not unravel. Bands are given from three to four coats of dipping varnish as they go to the baking oven for drying after being dipped. After coming out of the oven the band has a high polish, and carbon dust and dirt will not adhere to it. The various coatings form an excellent insulation which is quite flexible and durable, so that it will withstand severe temperatures.



Method of applying string band to armature

Axle Polishing Tool

BEARING fits on axles were polished originally in the Tompkinsville shop of the Richmond Railways, Inc., Staten Island, N. Y., by hand with fine emery cloth while the axle was turning in the lathe. This was slow and tedious. The tool shown in the accompanying sketch was designed to improve this method. It consists of two pieces of white



This simple clamp has afforded a means for decreasing the time for polishing bearing fits

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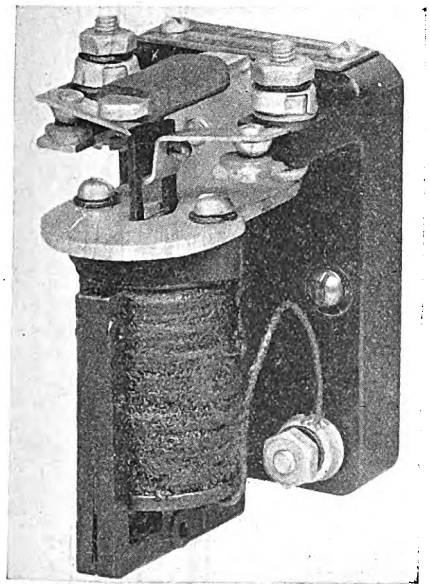
wood, 30 in. long, 3½ in. wide and 2¾ in. thick. They are hinged at one end and have suitable handles at the other. These blocks are bored with half holes of diameters such that when clamped together they approximate the various axle fits. The vertical diameter is made slightly less than the horizontal diameter in order to provide for rigid clamping.

The emery paper is placed around the circumference of these holes and is clamped over the axle fits, while the axle is revolved in the lathe.

New Equipment Available

Relay Warns When Power Fails

FOR use where a small inexpensive device is needed to actuate a warning signal a relay has been announced by the General Electric Company, Schenectady, N. Y. It acts



New undervoltage relay

when power fails or voltage drops on an important circuit. The device has been given the number CR-2904-F-1.

In operation, the coil circuit of the relay is connected across the two legs of the power supply which it is desired to watch. When the coil is thus energized, the relay contacts are held in an open position. By connecting a circuit through the contacts to a bell, horn, light or other signaling device, warning will be given when power fails or voltage drops, as in that event the coil will be de-energized, the contacts will close and the circuit to the warning signal will be completed. The relay can be used on either direct or alternating current.

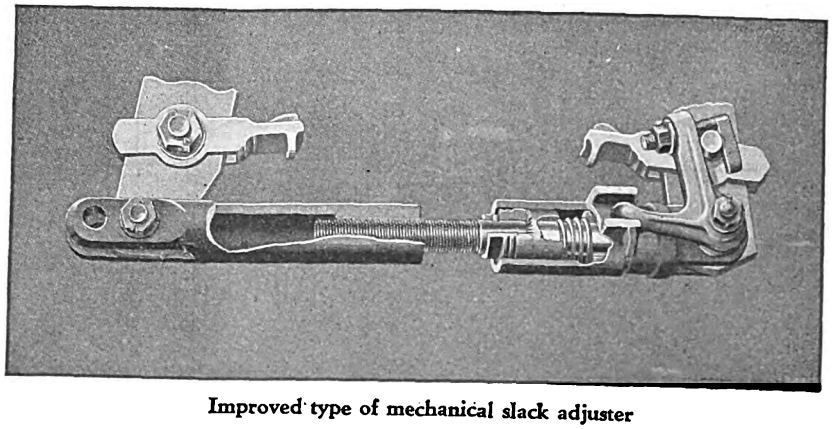
The relay is of the solenoid type, having a laminated armature of three sections, the central leg of which is fastened to a bakelite operating arm which raises and lowers the contact tips. The entire device is mounted on a molded compound base, 1⅞ in. wide and 2½ in. high, and is packed in a small cardboard carton together with a small, enameled tube resister, the rating of which varies according to the voltage and frequency of the application. The relay can also be supplied for panel mounting.

When used as a voltage drop warning device, adjustment to the proper operating voltages is made by means of an adjustable brass screw protruding into the air gap, over the outside leg of the armature. Thus a very fine adjustment of pick-up and drop-out may be obtained. In actual tests, the relay was made to drop out at 106 volts, after picking up at 112 volts, or at 95 per cent of the pick-up voltage. This ratio is held over a considerable range.

A typical application of the relay is on storage battery charging outfits. When the battery falls below the critical voltage, the relay places it on charge or increases the charging rate, and disconnects it when the voltage has come back to its full value.

Improvements in Slack Adjuster

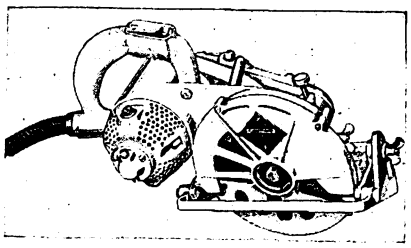
RECENTLY the mechanical slack adjuster manufactured by the J. G. Brill Company, Philadelphia, Pa., has been redesigned to facilitate the installation of new brakeshoes, eliminate a large amount of labor, and obviate the necessity of removing bolts or pins for reinstalling shoes. When new shoes are to be installed it is unnecessary to disconnect the opposite end of the brake rod in order to shorten it. The ratchet housing and the accompanying ratchet of the slack adjuster are moved back against the spring which holds the two ratchets together, so that the teeth are disengaged. Then the brake rod can be shortened by using a wrench on the hexagonal section. The ratchet feature results in more positive action and eliminates the chance of slippage.



Improved type of mechanical slack adjuster

Small Electric Hand Saw

CUTTING capacity of 2 in. is obtained with a small electric hand saw, a late addition to the Alta line of portable electric tools manufactured by the Wappat Gear Works, Inc., Pittsburgh, Pa. A noteworthy feature is the safety guards. The



New small electric hand saw

lower guard encloses the saw blade completely. It opens gradually by telescoping into the upper guard as the saw is pushed into the material, and snaps shut immediately as the cut is finished, thus affording protection to the workman and to the saw blade.

The new saw is built in three models, one for plain square cutting, a second for bevel cutting, and the third with adjustable dado cutter for grooving. On all three models the shoe is adjustable vertically, making it possible to set the saw to cut any required depth. The saw cuts all

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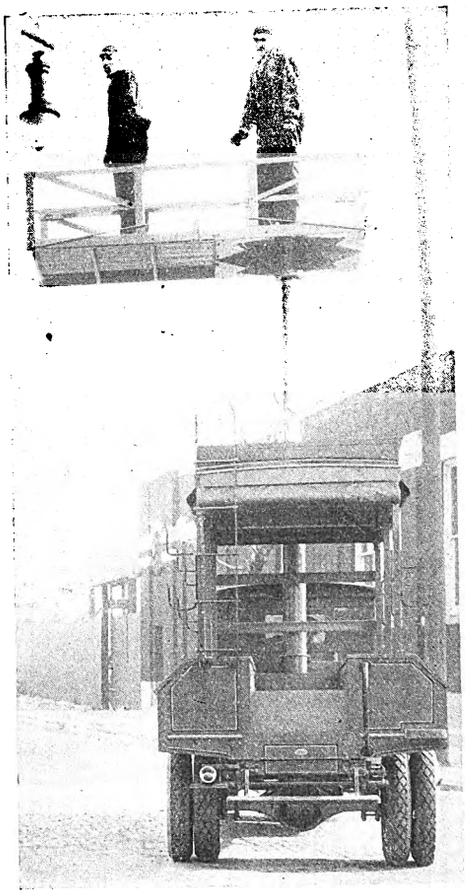
kinds of wood, metal, bakelite, fiber, and similar materials.

A high-speed universal ball-bearing motor, fan cooled, furnishes the power and shoots a blast of air to the front of the saw, thus clearing the sawdust away and making it possible to follow a line accurately. The saw shaft, mounted on tapered roller bearings, is driven by helical gears also mounted on ball bearings, all completely inclosed and running in grease. A double-pole, non-arc switch is mounted in the handle within easy reach of the operator's forefinger. The frame is all aluminum, highly polished, and all exposed steel parts are rust-proofed. Various parts are made of heat-treated aluminum alloy to retain lightness and obtain maximum strength.

Hydraulic Repair Tower

LIGHT in weight and compact in construction, a fast-operating hydraulic repair tower is announced by the Wood Hydraulic Hoist & Body Company, Detroit, Mich. It is designed for mounting on truck chassis having a capacity of 2 tons or more, and weighs approximately 1,200 lb. The principle involved is the same as in the hydraulic-operated dump trucks manufactured by the company, and all pumps and power take-off parts are interchangeable.

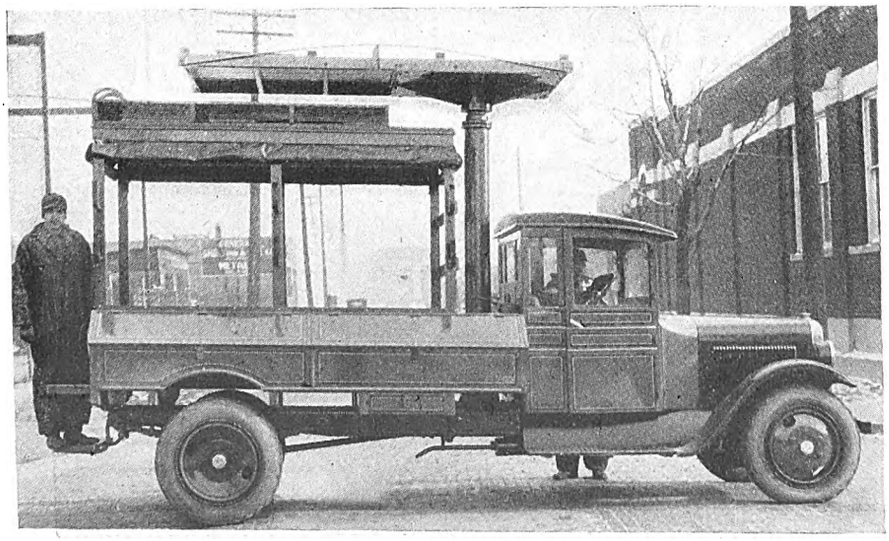
A 7-in. hydraulic cylinder with 5-in. hollow piston is used for the raising and lowering of the platform. This has a gear-driven pump, power take-off, oil reservoir piping and control valves. A wooden swivel working platform, 9x4 ft., with steel brace rods and hinged double-guard rails, is provided. It is insulated heavily between platform and platform base-



Front view with tower raised

plate. The platform may be locked securely in any position desired, and it is at all times rigid and level whether extended at right angles to the chassis or in fore or aft position.

Lowered in carrying position, the top of the platform is 11 ft. 6 in. from the ground. This varies slightly according to the height of the chassis frame. Fully elevated, it is 16 ft. 11 in. from the ground. Full elevation is obtained in about 40 seconds. On a tower truck supplied to the Twin City Rapid Transit Company, St. Paul, Minn., a collapsible ladder reaching from the top of the cab to the platform has been installed. This elevates and lowers with the tower. It permits workmen to climb up and down for tools or parts needed without lowering the platform.

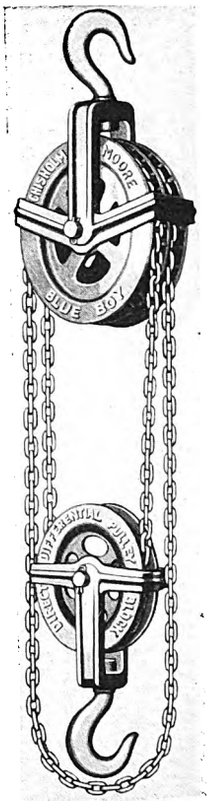


Side view of tower truck

Differential Chain Hoist

"BLUE BOY" is the trade name under which a new direct differential chain hoist is being marketed by the Chisholm-Moore Hoist Corporation, Cleveland, Ohio. The hoist is designed for extra heavy load. Sheaves, malleable iron yokes and drop forged hook are painted blue.

It is equipped with Hercules Inswell electric welded load chain. The chain is copper plated, which gives the hoist a particularly attractive appearance.



Direct differential hoist

Hinged-Type Finger for Railway Controllers

HINGED fingers of an improved type for railway controllers have been brought out by the General Electric Company. By employing a smaller radius on the contact tip support they have been made self-aligning, and at the same time the clearance between the contact tip support and the housing has been reduced so as to minimize the up-and-down movement of the tip on the segment.

The main arm is punched from bar steel, and will not bend or buckle. The tip, carried on the main arm, is designed for quick and easy removal since the finger proper will outwear many tips. The heel or hinged end of the arm seats and rocks on a steel plate, the joint being sufficiently narrow to permit alignment of the tip with the segment. This feature insures full-width contact and reduces heating and burning of both tip and segment.

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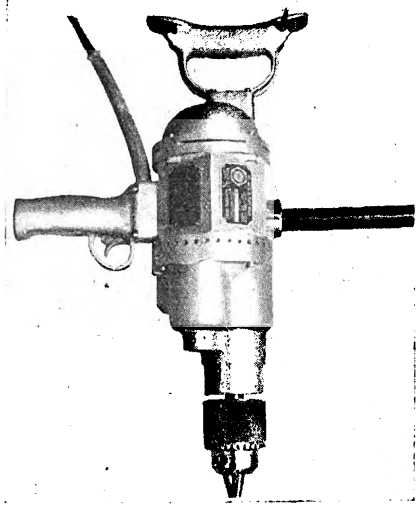
Heavy Duty Electric Drill

ANNOUNCEMENT of a ¾-in. heavy-duty portable electric drill is made by Black & Decker, Towson, Md. It is designed to meet the need for a powerful drill of this capacity to take straight shank drill bits. The drill has an exceptionally powerful universal motor, operating on direct or alternating current. The armature



Portable electric drill

and spindle thrust are mounted on ball bearings.

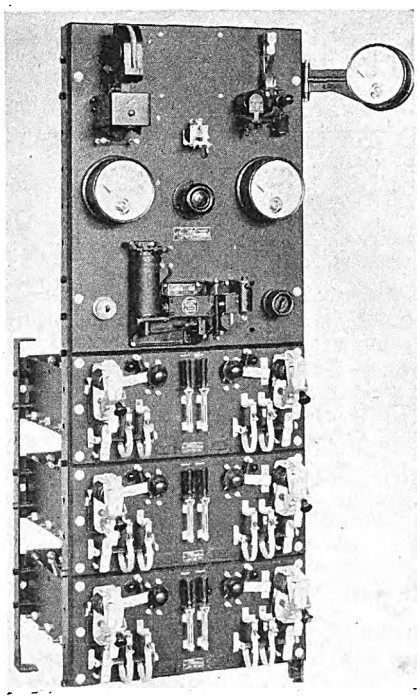
There is a three-jaw geared chuck, and the drill will work successfully in the toughest steel.

Panel for Charging Six Vehicle Batteries

SIX vehicle batteries, each of the 42-cell, 13-plate type can be charged through a new control panel announced by the General Electric Company, Schenectady, N. Y. The panel is for use in conjunction with a motor-generator set consisting of a 27-kw., 110-volt generator driven by a 40-hp., 550-volt, three-phase, 60-cycle motor.

In conjunction with a magnetic starter for the motor, the panel gives overload protection for the generator, restarting of the set and resumption of charging after line failure and full automatic shut-down after completion of the charging of the batteries.

On the generator section of the panel are mounted a snap switch for controlling the magnetic starting switch; a tumbler switch for full-automatic shut-down; a field rheostat; a voltage regulator; an overload and shunt-trip circuit breaker with a circuit opening auxiliary switch; auxiliary and line contactors, an ammeter and a voltmeter. The auxiliary contactor controlling the line contactor is adjusted to pick up at a proper voltage to insure charging. Its coil is connected through an interlock on the motor starting switch, thereby preventing the set from being driven from the batteries should the line voltage fail. An ammeter on a swinging bracket indicates the charging current delivered to the various batteries. Their charging voltages are indicated by a voltmeter which is mounted on the generator section of the panel.



Battery charging control panel with voltage regulator

The charging sections of the panel incorporate double-pole battery contactors equipped with a shunt-holding coil and which operate with ampere-hour meters having quick break contacts. On completion of the charge, the contact breaking device opens, de-energizing and opening the contactor and disconnecting the battery from the charging set.

When the last battery has been shut down a series of interlocks and switches shut down the set.

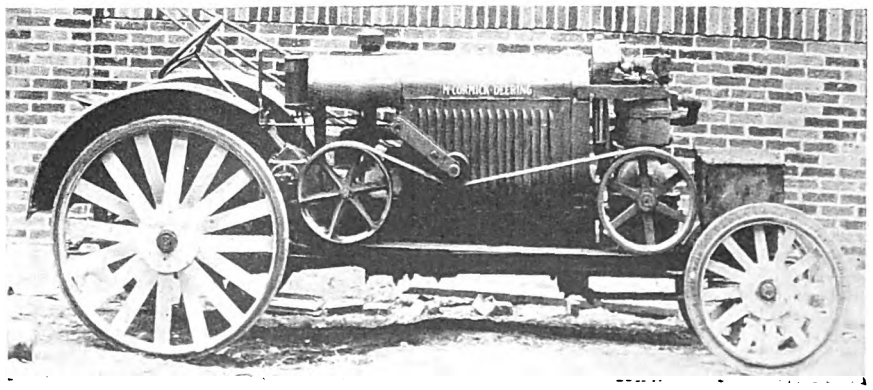
Each charging circuit also includes an ammeter-voltmeter switch for reading charging current and voltage; a single-pole, single-throw lever switch for boosting the charge; a pilot light to indicate when a battery is plugged to the panel, and a fuse for short-circuit protection.

The panel is of unit-section construction. Each section, with its resistor supports, is a unit which is secured to the skeleton framework by means of four corner capscrews at the front and four bolts at the rear. Removal of a section is accordingly simple.

Tractor Type Compressor

HEAVY loads can be hauled behind a self-propelled four-wheeled air compressor now being manufactured by the Pontiac Tractor Company, Pontiac, Mich. The compressor is a Quincy type W-4 of 124 cu.ft. displacement. It has a separate radiator with pump-driven circulation. This keeps the temperature of the air coming from the compressor from 60 to 70 deg. below the temperature of compressors which are cooled from the motive power radiator. The compressor has a three-bearing crankshaft with forced feed lubrication. This unit is controlled by a Penn unloader with a hand unloader attachment. The compressor with the air tank and tool box are mounted on a frame which attaches to either the McCormick-Deering or Fordson tractors.

The tractor drives the compressor through a power take-off pulley which has a clutch allowing it to be thrown into or out of gear at will. The forward drive of the belt brings the belt tightener into correct relation with the belt.



Self-propelled four-wheeled air compressor

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Association Activities

National Safety Council to Meet in New York City

ELECTRIC railway executives who are members of the National Safety Council will find much of interest in the program which has been arranged for the Electric Railway Section of that organization when it holds its seventeenth annual convention in New York City Oct. 1-5, 1928. Meetings and luncheons of this section will be held at the Hotel Waldorf-Astoria and will be participated in by men prominently identified with the safety movement.

The tentative program of the Electric Railway Section is as follows:

MONDAY, OCT. 3, AT 2 P.M.

Grand Ball Room, First Floor

Joint public safety session.

Representatives of Electric Railway Section assisted in arranging this general program which will be of interest to all electric railway men.

TUESDAY, OCT. 2, AT 9:30 A.M.

Main Room, on the Roof

Noteworthy accomplishments of the section during the past year. A. W. Koehler, chairman.

"Promotion of Accident Prevention through Inter-Departmental Co-operation," by John J. Reynolds, claims attorney Boston Elevated Railway, Boston, Mass., representing American Electric Railway Claims Association.

Discussion.

"Overcoming Transportation Hazards," by D. L. Fennell, general superintendent of transportation Kansas City Public Service Company, Kansas City, Mo.

Discussion.

"One-Man Car Operation from a Safety Standpoint," by D. A. Scanlon, general superintendent of railways Northern Ohio Power & Light Company, Akron, Ohio.

Discussion.

"Bus Operation from a Railwayman's Point of View." Speaker to be selected.

Discussion.

WEDNESDAY, OCT. 3, AT 9 A.M.

Main Room, on the Roof

"Reconciling Increased Speed with Safety," by Lucius S. Storrs, managing director American Electric Railway Association, New York.

Discussion.

"The Shop Employees' Contribution to a Safe Railway," by Henry Cordell, master mechanic Chicago, North Shore and Milwaukee Railroad, Highwood, Ill.

Discussion.

Election of officers.

WEDNESDAY, OCT. 3, AT 12:30 P.M.

Pennsylvania Hotel

Joint luncheon of Electric Railway and Public Utilities Sections.

THURSDAY, OCT. 4, AT 9:30 A.M.

Waldorf-Astoria

Safety play entitled, "Whose Fault?" Produced and presented by Public Service Corporation of New Jersey, Newark, N. J. Courtesy, A. J. Van Brunt, director safety education.

General round-table discussion.

Officers of the Electric Railway Section of the National Safety Council are as follows:

Chairman, A. W. Koehler, superintendent of accident prevention the Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

First Vice-Chairman, H. K. Bennett, safety manager United Electric Railways, Providence, R. I.

Second Vice-Chairman, E. K. Eastham, safety director United Railways of St. Louis, St. Louis, Mo.

Third Vice-Chairman, Melvin W. Bridges, safety engineer Chicago Rapid Transit Company, Chicago, Ill.

Secretary, J. E. Stott, safety engineer Georgia Power Company, Atlanta, Ga.

Of interest to electric railway men should be the proceedings of other sections of the National Council, which are to be held concurrently either at the Waldorf-Astoria or other hotels throughout the city. The Employees' Benefit Association Section is to meet Wednesday afternoon at 2 p.m. and Thursday morning at 9:30 a.m.; the Fire Prevention Section meets Friday at 9:30 a.m. and the Health Service Division meets Tuesday at 2 p.m., all meetings to be at the Hotel Pennsylvania.

The meetings of the Public Safety section, to be held at the Hotel Waldorf-Astoria, are to be general joint sessions with the Electric Railway, Public Utilities, Steam Railroad, and Taxicab and Fleet-owners groups in attendance, and extend over the entire week. Tuesday morning the papers and discussions cover "Accident Facts—How to Get Them"; the afternoon session is devoted to "Accident Facts—How to Use Them." Wednesday morning and afternoon the discussions cover motor vehicle legislation and traffic law enforcement, respectively. All day Thursday is given over to the subject of traffic engineering, and the meetings conclude Friday morning with an open session of the committee on personality and public accidents.

Are You Going?

PUBLICATION in this paper of an appeal to those who intend to go to the conference luncheons to be held at the 47th Convention of the A.E.R.A. brought many requests for tickets, according to Leslie Vickers, economist of the association. Arrangements have been completed so that there will be 750 seats all told, or 50 for each luncheon. Already 500 tickets have been sold. While there still are tickets for these luncheons, the only way to be sure of a place is to send your check for $1.50 per plate to Mr. Vickers. Specify which luncheons you wish to attend. Address him at A.E.R.A. headquarters, 292 Madison Avenue, New York City. And don't forget to

Inclose Your Check!

Billion Dollar Transit System Proposed

SUBURBAN transit relief in the metropolitan district of New York City presents a problem entirely different from that of local transportation and requires a separate solution, according to Francis Lee Stuart, consulting engineer, speaking at a meeting of the American Society of Civil Engineers held at New York Sept. 5. He estimated the ultimate cost of a suburban transit system at more than $1,000,000,000. Mr. Stuart said, in part, that:

Any extension of the present New York City subway systems into suburban territory should be opposed on account of their inadequacy and the discomfort for long riders. The subways should be used for rapidly distributing local city traffic. A proper solution of the suburban commuter problem of Manhattan should include intercommunication between all sectors of the metropolitan district. It should make provision for a distribution system in and through Manhattan without transfer, which would be supplemental to, and have no physical track connection with, the present city transportation system.

Provision should be made so that residents of the New Jersey, Westchester, Long Island, and Staten Island sectors of the metropolitan district may be routed to and through Manhattan when desired, from any one sector of the suburban area to another sector, thus securing the benefit of through routing and effectuating a two-way, interstate, passenger traffic movement.

The plan should be all-embracing and give all sectors common advantages. There should be Hudson River and East River crossings in the vicinity of 57th Street and connections to Westchester; and at the Battery, other crossings of the Hudson and East Rivers, connecting with east and west routes to Staten Island. Preference should be given to the 57th Street Bridge for crossings to New Jersey in that vicinity, because of its location and other advantages, and because of the fact that it would be much cheaper per track than a tunnel crossing. Preference should be given to tunnel crossings of the Hudson and East Rivers at the Battery because this would serve the lower end of Manhattan and would divide the outlying suburban territory of New Jersey and Long Island to an economic advantage.

The distributing system in Manhattan should be through terminal tunnels deep enough so as not to interfere with local subways, possibly on a third level. To make a minimum use of the local street

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distributing means in Manhattan, which are already crowded, the system should consist of two terminal tunnel routes extending from the Battery to 57th Street, separated several blocks apart, one on the East Side and one on the West Side, with four or five station stops in each line for suburban transit, at which no local station-to-station traffic in Manhattan would be allowed.

There should be a connection between these two terminal tunnel routes at the Battery and at 57th Street; and possibly an inside terminal loop between 57th Street, 23rd Street, and Madison and Seventh Avenues. This in effect would give a choice of routes from all sectors and would divide the system into simple east side and west side terminal routes easily understood by the general public, with an inside terminal loop to cut down unproductive mileage and facilitate operation when desired.

All tunnels should be of sufficient size to accommodate the standard railroad suburban equipment, which now represents a big investment of the railroads. Probably many of these coaches could be converted for multiple-unit operation at relatively small cost.

There are enough residential sections and diversified industries in the metropolitan district for all to find pleasant homes sufficiently close to their work, where the cost of transportation is within reach of their pocketbooks. The great mass of commuters comfortably delivered within walking distance of their destinations in Manhattan, without transfer, would gladly pay the cost of such improved service.

To accomplish the benefits sought for the public would take from five to eight years and would require the co-operation and co-ordinated effort of all the railroads and of the New Jersey, Westchester, Long Island, and Staten Island sectors. Individual effort would be ineffective and could not succeed.

The railroads have the collecting and distributing means already available in the suburban territory for intrastate and interstate purposes; but they could not be expected voluntarily to assume further financial obligations in such a re-organization of the present unprofitable commuter business except with the co-operation of all concerned and with the assurance of the proper support of the public rate-making bodies.

As a practical method of inaugurating such a plan, an operating company should be formed by all the railroads, which company would lease, for passenger purposes only, existing rights-of-way of such suburban railroads as may be needed. It would operate through the tunnel terminal routes on a fare which would be sufficient to pay operating costs, lease rentals, taxes, interest, amortization, etc., on the entire cost of the system.

Such a suburban transit system could be built gradually and would cost approximately $1,250,000,000 to $1,500,000,000. The system by the time it could be completed would probably be carrying 700,000,000 passengers yearly and the charges might add 10 to 15 cents to each railroad fare to or from Manhattan, depending on the amount of benefit assessment levied.

The securities of this system, supported by the needs of such a vast and growing population and based on a proper agreement as to a rate of fare required to stabilize the financing of its cost, approved by the Interstate Commerce Commission, by the two states, and by the city, would be a very desirable offering to investors and could be marketed on unprecedented terms, probably 3½ per cent, or lower.

In the discussion that followed the presentation of Mr. Stuart's paper, Gustav Lindenthal brought out the fact that tunnels cost from 100 to 150 per cent more than bridges. Charles E. Fowler, consulting engineer, expressed the opinion that decentralization was proceeding so fast in the metropolitan district that the transportation needs a decade hence will be so different from those of today that a large undertaking such as that proposed by Mr. Stuart should be inaugurated with caution. Harold M. Lewis, executive engineer Regional Plan of New York, presented data which he has collected concerning the transportation situation. John A. Miller, Jr., associate editor, ELECTRIC RAILWAY JOURNAL, expressed doubt concerning the feasibility of creating one single transportation system to serve the many and widely scattered suburban communities in the metropolitan district.

American Association News

Special Trains to Cleveland for Eastern Delegates

TWO special trains have been chartered by the American Electric Railway Association to carry delegates from the Eastern section. One of these trains leaves via New York Central at 6:30 p.m., Eastern standard time, Sept. 21, and will carry delegates from New York City, Albany and Syracuse. The other train leaves at 6:25 p.m., Sept. 21, via Pennsylvania Railroad and will pick up delegates from Washington, D. C., and through the Pennsylvania region. Information may be obtained from J. F. Craig, Westinghouse Traction Brake Company, 150 Broadway, New York.

Arrangements have been made by the New England Street Railway Club for a special train from Boston to Cleveland, Ohio. The train will leave Boston, Sunday, Sept. 23 at 3:40 p.m., and will be routed via the Boston & Albany Railroad to Albany and the New York Central from Albany to Cleveland, returning the same way. Stops will be made for delegates at Worcester, Springfield, and Pittsfield, Mass.

Information regarding tickets and reservations on this train may be secured from T. H. McGarry, Eastern Massachusetts Street Railway, 28 Chauncy Street, Boston, Mass.

In addition to the above, about a dozen special trains have been chartered for delegates from other sections of the United States.

Educational Conferences at Cleveland

CONFERENCES of personnel, educational and industrial relations directors will be held at the Hollenden Hotel, Cleveland, Ohio, on Wednesday, Sept. 27, and Thursday, Sept. 28, under the auspices of the committee on education. These conferences will deal with administrative problems in the field of industrial relations.

The topics for discussion are, "Job Training," "General Training," "Organizations and Functions of the Personnel Department," "Organizations of the Educational Department," "Employment and Accident Prevention."

On both dates the conferences will be preceded by a luncheon. It is expected that those who planned to attend will keep the afternoons open. Further information can be secured from A. J. Sarré, superintendent of industrial relations, New Orleans Public Service, Inc., New Orleans, La.

Metropolitan Section Will Have Get-Together Breakfast

FOR the benefit of those attending the Cleveland Convention of the American Electric Railway Association from the New York district, the Metropolitan Section has arranged a "Dutch Treat" breakfast on Tuesday morning, Sept. 25, at 8:30, in suite 100, Hollenden Hotel.

Invitations will be extended to all delegates from the New York district, whether or not they are members of the Metropolitan Section, A.E.R.A.

COMING MEETINGS OF *Electric Railway and Allied Associations*

SEPT. 22-28, 1928
American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

Sept. 25 — **Central Electric Railway Master Mechanics' Association, Cleveland, Ohio.**

Oct. 1-5—**National Safety Council, safety congress, New York, N. Y.**

Oct. 8-12—**American Welding Society, fall meeting, Philadelphia, Pa.**

Oct. 24-25—**Public Utilities Association of West Virginia, annual meeting, Huntington, W. Va.**

Nov. 7-8—**Iowa Electric Railway Association, operating meeting, Roosevelt Hotel, Cedar Rapids, Iowa.**

Nov. 13-16—**National Association of Railroad and Utilities Commissioners, New Orleans, La.**

Nov. 21-22—**Public Utilities Association of Virginia, Hotel Roanoke, Roanoke, Va.**

Jan. 14-18, 1929—**American Road Builders' Association, convention and road show, Cleveland, Ohio.**

Jan. 23-25, 1929—**Electric Railway Association of Equipment Men, Southern Properties, Houston, Tex.**

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News of the Industry

New Boston Agreement

Hourly rates on Elevated unchanged. Vacation privilege extended. Question of discipline discussed

THE board of trustees and the carmen's union of the Boston Elevated Railway, Boston, Mass., have reached a settlement as to the contract to be effective from July 1, 1928 to July 1, 1929. Only two changes have been made in the existing agreement.

Section 102, which entitles any employee who is suspended or discharged to have his case taken up by the officers of the association with the officers of the company and to be reinstated if he is not found guilty of sufficient cause to justify the action taken, has been changed by this addition:

Provided that during the public management and operation of the company the final appeal by the association in behalf of an employee who is suspended or discharged shall be to the board of trustees of the Boston Elevated Railway the decision of a majority of whom shall be conclusive, and shall not be subject to arbitration except for personal bias, prejudice or bad faith, and if made the subject of arbitration shall not be altered unless such bias, prejudice or bad faith is shown.

The other change consists in granting one week's vacation with pay to all members of the association who have been in the employ of the company for at least one year and have not been absent from work more than 28 days during the preceding year. A large number of employees now have vacations and the present action in extending this privilege to members of the association is in accord with modern industrial practice.

Recent years have shown a decline in passenger traffic in the summer months, which has resulted in laying off several hundred men during the period of lessened traffic. The provision for vacations will tend to lessen the hardships of a lay off of this kind.

The change with regard to discipline and discharge places the final determination as to fitness for the transportation service entirely in the hands of the Board of Trustees.

President Mahon of the Amalgamated issued the following statement:

There has been a mistaken notion in this city that the organization of which I have the honor to be president has attempted to interfere with discipline on the Boston Elevated Railway system. This idea seems to have been focused upon the happening of the recent unfortunate accident at Beach Street. I instructed Mr. Vahey, our counsel, to make a statement directly after the investigation by the Department of Public Utilities which I have read and which I approve.

It doesn't seem, however, that it was as far-reaching as I thought it would be. As a matter of fact the organization which I represent has never attempted to influence the management of the road either in the hiring of men or the discharge of them. We have only claimed that sometimes a man was discharged by reason of unionism, prejudice, bias or bad faith. On those occasions we thought that we should take up their cases and discuss them with the management and if we arrived at no satisfactory conclusion, should arbitrate them. We have arbitrated only five cases on this system in sixteen years, which is a very remarkable record.

We think that discipline has been and properly should be in the control of the company. We make no complaint about discipline unless one of the four elements which I have mentioned before occurs.

In view of our recent settlement with the trustees of the Boston Elevated Railway I thought it proper to say that we wanted the people of the communities served by this company to understand that we haven't in the past and don't intend in the future to interfere with discipline on this road so long as justice and fair play are shown toward our membership.

The outstanding provision in the new agreement, the matter of discipline, has been a tender issue in the past and public attention was focused upon it after the recent fatal accident at Beach Street in which a motorman who had been reprimanded for infractions of the rules and yet had been retained in the service, was wholly responsible for the crash.

The rule has been in the past that a union member who was discharged or suspended could take his case before his own union executive board which had a right to take the matter up with the management of the company and the company was obliged to furnish its reasons. If the company and the union executive board did not agree the matter would have to go to an arbitration board whose decision was final, so that it was extremely difficult for the management to discharge a man except where the most positive proof existed of his unfitness. It is generally believed that this change was brought about, or at least facilitated, by the determined stand Governor Fuller took in the matter of discipline of the men arising out of the Beach Street accident.

Rates of wages, which remain as they were, are 75 cents an hour for the uniform men on two-man cars and 85 cents an hour for the men on one-man cars, and the operators of buses. It is said that the vacation provision will cost the company about $180,000 a year.

Brief Filed in Denver

Through its attorneys the Denver Tramway has filed a brief resisting the efforts of the city of Denver, Colo., to have the United States Supreme Court review the case in which the lower courts and the United States Court of Appeals ruled that the company has a perpetual franchise in the city of Denver.

Settlement in Sight

Commission decides Washington Railway & Electric must be party to 10-cent fare application of Capital Traction

THE District of Columbia Utilities Commission recently ruled that the Washington Railway & Electric Company must become a party to the Capital Traction Company's rate increase petition. This ruling, made effective immediately by the action of the Washington Railway & Electric Company in waiving the ten days' notice provision, was rendered in connection with a movement for the dismissal of the case by the People's Counsel.

It was claimed by the People's Counsel that the proceedings should be stopped because the Capital Traction Company had indicated through its president that it would not accept the requested increase unless such increase were made applicable also to the Washington Railway & Electric system. It was also claimed that the increase in fares could not be applied to the lines of the Washington Railway & Electric Company since that company had not been made a party to the case.

In arriving at its decision to bring in the Washington Railway & Electric Company, the commission pointed out that the verbal statement of the president of the Capital Traction Company about the intentions of his company in applying the increase sought did not constitute a withdrawal of that company's application. It was also brought out that the president of the Washington Railway & Electric Company had stated voluntarily that his company certainly expected to participate in whatever increase in rates might be granted the Capital Traction Company. The commission also ruled that the Capital Traction Company could introduce operating statistics of the Washington Railway & Electric Company, gathered from utility reports, as evidence of information applying to its own case. This was in answer to protests by the People's Counsel that such evidence showing that the Washington Railway & Electric Company also needed a higher fare, would have the effect of bringing that company in "through the back door."

The president of the Washington Railway & Electric Company stated that his company had not been consulted by the Capital Traction officials about the application for the fare increase. Although he did not state whether or not his company desired an increase in fare, he pointed out the difficulties that would result from a dual rate of fare. He also stated that it had always been the policy of the commission to establish a unified fare in the District of Columbia when awarding an increase in fare to

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one company, whether or not the other asked to be made a party to the proceedings. Counsel for the Capital Traction Company protested that a dual rate of fare would be discriminatory against the company charging the higher rate.

An application for a straight 8-cent cash fare or a 10-cent fare with four tokens for 30 cents was filed on June 15 by the Capital Traction Company. At that time officials of the Washington Railway & Electric Company announced they were not a party to the petition. However, it was generally accepted that the utility commission would require both companies to maintain the same fare in case the increase were granted. The present rates are 8 cents cash or six tokens for 40 cents on both systems in the District.

Canadian Border Men Receive 2 Cent Increase

By a large majority, platform employees of the Hydro-Electric Railways, Windsor, Canada, voted on Aug. 28 to accept a 2-cent wage increase rather than submit their demands for an additional 10 cents an hour to a board of arbitration. The agreement, which was drawn up and submitted by William R. Robertson, superintendent, will be retroactive to July 1 when the old contract terminated. In addition to seeking increased wages the men asked the commission to allow one week's holiday with pay and the operation of two-men cars on trunk lines. The last-named concessions are to receive further consideration, according to a communication to the men from the commission. The wage increase of 2 cents brings the maximum pay up to 62 cents an hour, in addition to which the men receive free uniforms.

Five-Cent Community Fare Suggested for Detroit Suburbs

The heads of the three down-river municipalities—Ecorse, Wyandotte and River Rouge—conferred recently with W. G. Fitzpatrick, attorney for the Detroit United Railway, Detroit, Mich., regarding the fare increases in effect since the Department of Street Railways at Detroit began operation of its cars over the Detroit United Railway tracks to Wyandotte.

Ira Kreger, Mayor of Wyandotte, was elected permanent chairman. He selected a committee to forward to the county board of supervisors a request that an annual rental of $15,000 charged the Detroit United Railway for use of the River Rouge Bridge be abolished, on the ground that the rental raises the overhead expenses of the company and that no other public transportation service pays a similar rental charge.

Finally a committee was named to meet representatives of the railway to work out a solution of the problem. Efforts are to be made to establish a 5-cent fare for transportation within the limits of each municipality.

Riding as Guests in Philadelphia's New Subway

Philadelphia indulged in a real lark on Sept. 1, the day the Broad Street subway was thrown open for inspection. With embossed invitations in their possession some 20,000 persons rode free as guests of the Mayor, the city and the Philadelphia Rapid Transit Company. All of Philadelphia was represented—the butcher, the baker and the big profits makers—and many a prosperous "strap-hanger-for-a-day" rode with his family while the limousine stood idle in the driveway. Here's how one of the local accounts put it:

Public Ledger Photo

Mr. Mitten and public officials on first run of Broad Street train

It was a lark, riding in the subway. The riders came in spotless holiday attire—dainty maids all in white, beaming matrons in expensive gowns and wearing jewels, dignified gentlemen with canes and eyeglasses, who peered critically at the new equipment and talked sonorously of comparative values between New York and Philadelphia rolling stock.

"Half of 'em piles right back through the turnstiles and goes back where they got on," said one Rapid Transit veteran, "they's just out for a ride and to see what $87,000,000 looks like in a hole under the ground."

"Only 6½ miles. It's not much on length, but it makes up for a lot of short-comings in quality," an enthusiast declared. He referred to the lights, for this is an entirely illuminated subway. He referred to its dustless atmosphere, the special ventilating system that works by passage of the trains; to expensive tile stations, to its four-track construction, the airiness of the place and its spaciousness.

Over Saturday and Sunday the subway was the city's most popular source of amusement.

"I guess about two out of three couples Saturday night were young bloods out with their Shebas," said a City Hall supervisor. Others killed the best part of Sunday afternoon showing municipal progress to the girl friend. Policemen passed up the ball game to ride on the cars.

One old man jiggled a free pass under a crony's nose and chortled at his craftiness.

"I've rid round the durn thing 24 times and, by jing, I'm going round again," he cackled.

When the road was opened to public service the next day it was one thrill upon another for the children. No sooner were they in the trains than they raced to the front car and massed before the half-open window, standing there the entire trip, their hair blown straight back by the rush of air gulping up the flitting picture of the freshly painted passageway beneath the city.

The grown-ups, too, craned necks in every direction as they walked down the entrances.

Utility Hearings Postponed

Because of the absence from Washington of Judge Healy, chief counsel for the Federal Trade Commission, the commission's first hearing on public utility publicity methods scheduled for Sept. 13 has been deferred until Sept. 18. For that day the following witnesses have been called:

H. P. Weeks, director of the Iowa section of the National Electric Light Association; J. W. Bennett, who will present matter received from the Canadian branch of the National Electric Light Association, and C. H. Howell, president of New Jersey Electric Association and chairman of the New Jersey Public Utility Information Committee.

Opportunities for Self-Advancement in Wisconsin

Educational courses in elementary accounting, advanced accounting, commercial salesmanship and other subjects will be offered by Wisconsin Public Service Company and the Menominee and Marinette Light & Traction Company to their employees during the coming winter. Classes will be organized at each division where a sufficient enrollment is obtained. No charge is made for enrollment, the necessary texts being prepared and furnished by the company. Employees are urged to take advantage of one of these educational opportunities.

Conciliation Board to Consider Twin Cities Wages

The appointment of a conciliation board to arbitrate in the railway wage dispute in Fort William and Port Arthur, Ontario, is announced by the Department of Labor at Ottawa, Canada. The application for the board was made by the employees and concurred in by the municipalities. The chief point of contention is stated to be in regard to wages. A general increase of about 5 cents an hour is being requested by the men. The question of one-man cars will also be dealt with, it is intimated. The employees are members of the Amalgamated Association. The roads in the sister cities are run under the auspices of the municipalities.

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Losses Disclosed at Fare Hearing in New York City

Hearings were opened on Sept. 7 by the New York Transit Commission on the Eighth & Ninth Avenues Railway's application for a 7-cent fare on all of its lines. Commissioner Leon G. Godley presided. The hearing was adjourned until Sept. 21.

According to John Vance Hewitt, counsel for the railway, the company had suffered a steady loss running into millions, despite the strictest economies practiced by the receivers. He said that the loss from May, 1927, to the present time had been $140,000. Charles H. Jewett, the second witness, produced figures on the cost of electrification of the system between 1898 and 1902, when the transition was made from horse-drawn cars to electric surface cars.

Before the witnesses were examined, Assistant Corporation Counsel Joseph A. Devery questioned the power of the Transit Commission to regulate the fare.

George H. Stover, counsel to the Transit Commission, proposed that the railway withdraw its petition under section 29 of the Public Service Commission law, and re-submit it under section 49, inasmuch as under section 29 the commission must either approve or deny the increased fare asked, while under section 49 it had the authority to investigate the question of an adequate fare and fix the rate accordingly. Mr. Hewitt, counsel for the company, had no objection. Commissioner Godley reserved decision on the matter of a choice of section.

Public Receives Cars Favorably in Cleveland

Sixteen of the Cleveland Railway new articulated cars, described in ELECTRIC RAILWAY JOURNAL, issue of Sept. 1, pages 328-331, were put into service on the Euclid Avenue line in Cleveland, Ohio, on Sept. 10. At the same time the company opened its carefully worked-out campaign to make car riding more popular by running full page advertisements in the daily newspapers. The advertisements describe the new cars and conclude with this statement:

> There are no traffic problems or parking worries if you use the street railway.

The manner in which the public received the new cars is regarded by company officials as a positive indication that they will add riders to the line. The riders were particularly interested in the articulated connection between the two cars and seemed especially pleased with the comfortable leather seats, the elimination of the step between the front vestibule and the floor of the car, the various safety devices and the pleasing interior decorations.

The cars are being operated with one motorman and two conductors. It would be possible to operate them with only one conductor were it not for the confusion which would result in passing through East Cleveland, where the fare is 2 cents more than in Cleveland.

Joseph H. Alexander, president of the Cleveland Railway, recalled that the new cars were put into service 40 years after the first electric cars started operating on Euclid Avenue. At that time ELECTRIC RAILWAY JOURNAL carried the following statement:

> Horse cars have been taken altogether from Euclid Avenue and electric motors reign supreme. Eight cars run throughout the day. Inquiries of employees and patrons who have ridden on the motor cars every day since they began running show that no bad effects have been observed on watches carried in the cars. One conductor enthusiastically declares that his watch runs better than ever since subjecting it to the action of the electric current.

Strike Flurry Subsides in Oklahoma City

A ticklish situation in Oklahoma City, Okla., which arose unexpectedly, was clarified recently when a threatened strike of the men of the Oklahoma Railway failed to materialize and the men admitted no grievance and resigned from the union. The organized element of the railway recently asked the company to adjust grievances, which involved a demand for an increase of approximately 20 cents an hour in the wage, which ranged from 44 to 53 cents depending on seniority; revision of the seniority policy in favor of bus drivers who want to go back to street car and freight service with their old rating and recognition of an Oklahoma City local of the Amalgamated.

Negotiations between workers and railway officials were at a standstill pending word from Hubert Hudson, president, who was in Arizona. Meanwhile talk of a strike simmered down and employees began resigning from the new local union, which had been organized among the train service employees. On Tuesday, Sept. 4, all the officers of the union resigned. The company posted a notice that the men who withdrew from the union and desired to sign up would be given their old positions with the company.

Calamity as Bert St. Clair sees it

In the Interest of Safety at Niagara

A resolution has been passed by the City Council of Niagara Falls, N. Y., appointing a committee to investigate reports of the swaying of the Falls View Bridge of the International Railway, Buffalo, N. Y., across the Niagara Gorge at Niagara Falls. Reports that the bridge sways under heavy traffic, especially on holidays, have been current for several years, but investigations by engineers have shown the toll bridge to be safe. One Buffalo newspaper, in commenting editorially upon the action of the Niagara Falls City Council, recommended that the company invite the American and Canadian governments to have engineers make impartial investigations to determine the safety of the steel arch span above the Niagara Gorge. The action of the City Council was taken following reports that the company itself curtailed traffic over the bridge during the Labor Day rush period.

Change in Service Sought by Colorado Line

The Grand River Valley Railroad, operating from Grand Junction to Fruita, Colo., has asked the Public Utilities Commission for permission to reduce its service so that it may engage only in the hauling of carload lots of freight and let the motor bus take care of passengers and small freight. It claims a loss of $10,000 las year. The Western Motorway, Inc., informs the Commission it is ready to take up the passenger service from Grand Junction to Fruita and Mack, Col.

No Service in Off-Peak Hours

Service by trolley between New Castle and Delaware City has been curtailed by the Delaware Electric Power Company. Cars run between the two towns only during the late morning and afternoon. Formerly cars were run between New Castle and Delaware City, connecting with Wilmington, every hour. The change does away with cars in the middle of the day, except on Sunday. The height of the traffic is early in the morning and late at night. Very few people use the cars in the middle of the day.

Many workmen living at Delaware City use the trolleys to get to their work at the Delaware Rayon Plant near New Castle. The curtailment of service will in no way affect their commuting, it is said, as these people use the cars early in the morning and about 5 o'clock in the evening. Soldiers at Fort du Pont likewise will not be affected in coming to and from Wilmington. Car service will be maintained late at night to carry them back to Delaware City.

On Sunday cars run every hour, commencing at 8 in the morning and stopping at 12:30 at night.

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Date Set for Hearing in Baltimore Depreciation Issue

The Maryland Public Service Commission has set Nov. 15 as the date to open a hearing on the depreciation issue in the case of the United Railways & Electric Company, Baltimore, Md. H. Carl Wolf, chief engineer of the commission, has announced that he believes he can complete the valuation work by that time, barring unforeseen delays.

In the meantime, however, counsel for the commission plans to continue its efforts to win a stay of the hearing and with this in mind will seek an appointment with Justice Brandeis, of the United States Supreme Court. Recently Justice Brandeis refused to give an immediate decision and this was followed by an application made by the United to have the commission hold an immediate hearing on the depreciation issue. This was in accordance with a decision handed down by the Maryland Court of Appeals.

Dry Dock Petition Put Over

The Transit Commission has adjourned to Sept. 19 its hearing of the application of the Dry Dock, East Broadway & Battery Railroad for a fare increase to 7 cents. The company operates the Grand Street crosstown line, the Grand Street to Brooklyn line, the Postoffice, Manhattan, to Brooklyn line, and the Avenue B line.

Assistant Corporation Counsel Joseph A. Devery questioned the right of the commission to rule on the company's application for increased fare, but Alfred T. Davison, counsel for the company, insisted that the Public Service law permits the commission to adjudicate the fare question. He submitted tariff schedules of the company, but these were excluded temporarily and the hearing adjourned to permit submission of briefs on the admissibility of the papers.

Reroutings in Salt Lake City to Become Effective

Mergers and reroutings of many lines of the Utah Light & Traction Company, Salt Lake City, Utah, are to become effective within the next few weeks, following the suggestions of Ross W. Harris, traffic expert, who has conducted a survey of the conditions. Mr. Harris pointed out that the burden of traffic routed down Main Street between 5 and 6 p.m. was causing unnecessary congestion. With a staff of assistants, Mr. Harris has been working on Salt Lake's traffic problem since February. The expert's conclusions do not deal exclusively with car congestion, but embrace many angles of the traffic problem. During his survey Mr. Harris had the co-operation of Commissioner T. T. Burton, head of the public safety department, and Chief of Police Joseph E. Burbidge.

According to E. A. West, general manager of the company, the survey indicated a means whereby the city might conveniently solve some of its major street congestion problems.

New Warning Signals on International Interurbans

The International Railway, Buffalo, N. Y., is installing a new type of automatic electric flashing signal at all highway crossings over its interurban lines in western New York. The new signals, evolved by the electrical engineering department of the company, are built on a concrete base in the center of the highway on both sides of the crossing. The base is painted black and white in a checkerboard design.

If warnings mean anything then motorists are amply protected at International Railway crossings

The red electric lights hung on the crossarms flash alternately from one side to the other and there is a red prism reflector near the base so that headlights shining upon it will focus the attention of drivers upon the crossing sign.

The red lights start flashing when trolleys are approximately 2,000 ft. from the crossing or from 30 to 32 seconds away as compared with the requirements of the New York State Public Service Commission of 20 seconds distance from the crossing, giving a wide margin of safety. Flashing signals of this type are being made the standard for the Buffalo-Niagara Falls high-speed interurban.

Experimental Rate in Oklahoma To Be Permanent

The Northeast Oklahoma Railroad, Miami, Okla., has announced that the 10-cent passenger rate to any point on its lines in Oklahoma, which has been in effect for several weeks, will be made permanent. It is unofficially understood that this rate has brought an increase of approximately 60 per cent in passenger travel. In the original announcement of the 10-cent fare experiment it was stated that since the area served by the company in Oklahoma was not unlike a metropolitan service area in that all points had an equal interest in the service, it was believed this rate would prove popular.

The company also announced that on Sundays during September an excursion rate of 35-cents for the round trip between Columbus, Kan., and any Oklahoma point on the line will be in effect.

New Solutions Offered for Seattle's Paving Problem

Refunding of the debt of the Seattle Municipal Railway, Seattle, Wash., on a longer time basis, with greatly reduced annual payments and passage of a home rule bill by the next state Legislature, giving to cities of the first class a free hand in the financing and operation of their public utilities, is proposed by Councilman A. Lou Cohen as solutions of the city's track paving problem. Declaring his determination to sponsor action on both these measures, Mr. Cohen expressed confidence that success in the effort not only would enable the speedy completion of paving between the street car tracks, but that the railway system would be able to rehabilitate itself out of its own earnings without further bond issues.

Preparing to Argue Interborough Fare Case

Mayor Walker of New York has announced that he will go to Washington to attend the hearing before the United States Supreme Court on the Interborough Rapid Transit Company's petition for a 7-cent fare. The hearing on the appeal taken by the city from a ruling in the Statutory Court in New York City is scheduled for Oct. 1. The Mayor is familiarizing himself with the ramifications and technicalities of the case so that he will be in a position to give aid to the city's counsel in arguing the case before the highest court. Samuel Untermyer will argue the case for the city, according to Mayor Walker. Mr. Untermyer recently hurried home from Europe after he had been stricken with an acute attack of asthma, but it is said that he will be able to appear in the case unless there should be some adverse development in his condition not now foreseen.

Counsel for the Interborough Rapid Transit Company last week seemed an order to prevent the city from obtaining a Supreme Court review of the four motions lost by the city and the Transit Commission in the Statutory Court in New York. This order dismisses two appeals for a review of the four lost motions on the ground that the appeals were not filed within the time required by law. One of the motions was to strike out the amended and supplemental complaint of the Interborough Rapid Transit Company.

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Better Handling of Rochester Subway Interchange

Steps toward bringing about the efficient handling of traffic on the subway railroad at Rochester, N. Y., were taken at a conference recently in the office of Charles R. Barnes, Commissioner of Railways, at which it was agreed that this matter should be in charge of a joint committee representing the steam railroads, the New York State Railways, by which the road is run, the city, and the shippers.

The committee will consider all matters in connection with the handling of cars in the subway to and from industrial sidings, also interchange movements between steam roads. It will suggest reports and methods for the efficient handling of cars in the subway so as to accommodate best shippers and the roads interested. This committee's report will later be submitted to the general conference of interested parties for consideration.

At the recent conference there was a general discussion of the character of the form which should be used in the delivery to and interchange of cars through the subway railroad. It was finally agreed that each steam railroad shall furnish the New York State Railways with a standard form of switching waybill which shall include date and time of delivery to the subway and all necessary information, at the time delivery of cars to the subway is made; sufficient copies to be furnished the New York State Railways.

Deferment of Service Problems in Seattle

To give time for a Council survey of the Seattle Municipal Street Railway situation in Seattle, Wash., the utilities committee of the City Council has laid over for six weeks a decision on the variety of petitions for car line extensions and new bus service. This action was taken after Assistant Superintendent Roy E. Furse of the municipal railway system told the Council that his department faced a loss of $160,000 on bus operation this year and that a general rehabilitation of the railway system was necessary to solve the transportation problem.

Subways Crowded Everywhere—South American's Comment

After making a tour of inspection of the subway systems of London, Paris and New York, Guillermo Fels, engineer-in-chief and general manager of the Buenos Aires Underground Railways, has left New York for home. He noted that the milling crowds of the Times Square have parallels in European cities. So far as the indignities suffered by women in the crowded cars Señor Fels said that a similar condition existed in the Argentine. When two cars were set apart there for women exclusively, one at either end of every train, the cars were left empty. Later the management decided that the women were afraid of end cars so the two middle cars were set aside for them, and again the women shunned the cars. Consequently, the plan was considered a failure.

No Settlement in London, Ont.

Appointment of conciliation board expected to settle demands for wage increases. Railway unable to meet demands

NO SETTLEMENT has been made of the wage dispute on the London Street Railway, London, Ont. The Amalgamated Association has made application to the Minister of Labor calling for the appointment of a board of conciliation to handle the controversy. The Minister of Labor placed the matter before the management Aug. 31, and the company stated its position and advised the Minister that the matter of a conciliation board would be taken into consideration by the company at the next meeting of the board of directors.

The strained relationship in London is the result of agitation over a new agreement which started on Jan. 30 of this year when the Amalgamated Association filed a 60-day notice with the railway, signifying its desire for an adjustment of wages and working hours. Subsequently demands were filed for an adjustment of the wages of motormen and conductors, of 7 and 12 cents an hour. This is from a rate of 48 to 55 cents for motormen and conductors. A rate for one-man operators of 65 cents an hour, an increase of 12 cents an hour, and a rate of 65 cents an hour for bus operators, from the present rate of 50 cents an hour, were also filed. Other demands included time and a half for all overtime and also time and a half for all Sunday work.

At present motormen and conductors are paid on the basis of 48 cents an hour with 12 cents an hour for all overtime and 12 cents an hour for all Sunday work; that is, motormen and conductors are receiving 60 cents an hour on Sunday and one-man operators 65 cents. Bus operators receive 50 cents an hour and 10 cents an hour for all overtime work and on Sundays receive a straight 60 cents an hour. Requests were also made for a reduction in hours of carhouse men working twelve hours a night, the union suggesting that these hours be reduced to 9 hours a night.

The company's position was explained by the statement that it was operating on a 5-cent fare and as its applications to the city of London for an increase in fares had been refused the railway claimed it was unable to meet any of the demands of the employees, or in fact, allow for any increase in wages.

Under the industrial disputes investigation act the company is not bound to agree to the appointment of a board of conciliation, but it is said that it will likely agree to the appointment of a board of this kind to handle the matter.

New Children's Cards in Baltimore Oct. 15

The United Railways & Electric Company, Baltimore, Md., has authorized the school children to use their last year's identification cards in the purchase of 5-cent school tickets until Oct. 15. This was occasioned by a postponement in the opening of the public schools from Sept. 5 to 17 on account of an outbreak of infantile paralysis.

In order to relieve the teachers and principals from the task of making out lists of pupils entitled to the 5-cent tickets the United has decided to permit each child to fill out his or her own application and have it signed by the teacher or principal.

Senator Couzens to Report to Detroit Mayor on Finance

United States Senator James Couzens conferred recently with Mayor John C. Lodge of Detroit, Mich., relative to transportation problems in general and the finances of the Detroit municipal railway. Both refused to discuss the nature of their conversation. As a first step in the conference Mr. Couzens and the Mayor considered railway affairs with Clarence E. Wilcox and G. Ogden Ellis, of the street railway commission. It is said that Senator Couzens will place his ideas relative to financing and other problems in writing and submit them to Mayor Lodge.

Proposed Subway Developments Continue in Cleveland

At the last meeting of the executive committee of the Cleveland Railway, Cleveland, Ohio, Joseph H. Alexander, president, was authorized to have the firm of Parsons, Klapp, Brinkerhoff & Douglas make a survey of the Cragin subway proposal in conjunction with the rapid transit plans of the Van Sweringens. This development for the first time brings Raymond Cragin's subway plan in contact with the Van Sweringens' rapid transit program. Operation by the Cleveland Railway is contemplated in both plans. The proposal of the Cleveland Subway Company, promoted by Raymond Cragin, realtor, is to construct subways to cost $30,000,000 to be owned by the city, operated by the Cleveland Railway and paid for out of street car and motor coach receipts.

When Mr. Cragin broached his subway construction scheme to the City Council, he stressed the point that the subways were designed to serve a different territory than that to be served by the projected rapid transit lines along the rights-of-way of various railroads entering the new union terminal. Subway routes proposed would serve city car riders primarily, while the Van Sweringens' rapid transit lines would barely touch any residential section of Cleveland, serving the suburban riders primarily.

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Engineers employed by the Cleveland Railway have been studying the Van Sweringens' rapid transit plans for nearly a year. They have collected a mass of data forecasting changes which would be brought about by rapid transit lines and making recommendations as to how street car and motor coach routes should be co-ordinated with rapid transit service. Their report has not been made public. Recently the street railway committee of the City Council suggested that Mr. Cragin should take up his subway proposition with the Cleveland Railway before asking the Council to pass on it.

Lately a new mystery subway company, called the Cuyahoga Subway Company, was incorporated for operation in Cleveland through two firms of attorneys, who say they do not know what interests are connected with the company. Petitions for an initiated ordinance have been prepared and are being circulated. If the petitions receive 5,000 valid signatures, the City Council will be required to submit the ordinance to a vote of the people at a regular or special election. The proposed ordinance grants the Cuyahoga Subway Company sweeping rights to construct subways, elevated lines and appurtenances in or over any street in the city. Nothing definite has been divulged so far about methods of operation or fares.

Interstate Question Raised at East St. Louis

The City Council of East St. Louis, Ill., on Aug. 22 directed Dan McGlynn, corporation counsel, to take steps to compel the East St. Louis & Suburban Railway to establish a single fare zone in East St. Louis on its Belleville-St. Louis line.

At present the fare from downtown East St. Louis to 42nd and State Street is 10 cents straight or 8 cents if tokens are purchased. The fare from downtown to Roberts Place (5400 on State Street) is 12 cents and the fare to Edgemont 14 cents. All this territory is within the city limits of East St. Louis. On all other East St. Louis lines, including the Rosemont, Washington Park and Alta Sita divisions, the fare is 10 cents cash or 8 cents with tokens.

Former United States District Judge English in September, 1919, issued an injunction which forbade interference by the Illinois Commerce Commission or any other state, county or city body under which the company split East St. Louis into three fare zones on the East St. Louis & Suburban line to Belleville. Prior to the injunction granted by Judge English the fare to Edgemont was the same as any other section of East St. Louis.

The city probably will apply to the Interstate Commerce Commission for relief, since the St. Louis-Belleville line crosses the Mississippi River into Missouri. An effort will also be made to have the present United States district judge modify or remove Judge English's injunction order.

New Financial Plan and Ordinance Projected in Chicago

Consolidation proposed under new suggestion with service-at-cost, ultimate city purchase, home rule and terminable permit. Railway managements studying plan

STREET car fares may be removed as a possible political football in Chicago for the next ten years, if plans devised during the week ended Sept. 15 by a sub-committee of the City Council's local transportaton committee materialize.

At a meeting of this sub-committee on Sept. 10, it was decided to alter a section of the proposed new railway program, which is based on a "service-at-cost" arrangement, to provide that street car, elevated and motor coach fares could not be reduced during the initial ten-year period of the new regime. The proposed financial set-up, amending the present state law, in its original form provided that changes in rates of fare could be made either up or down by the local regulatory commission,

Reason for Change Explained

The drafting committee, appointed by Chairman E. I. Frankhauser to rewrite the ordinance to that effect, explained the purpose of the change as being "to keep the city's purchase fund growing during the ten-year period, so that we will have enough money for extensions and so that ultimate purchase will be possible. If fares were decreasing during that initial period it would hurt the finance plan of the project." The new clause, however, will not prevent a fare increase in the event that higher fares are needed to make the financial plan safe.

In the first ten years the program provides for spending $135,000,000 for extensions and improvements to both the surface and elevated lines and, in addition, approximately $65,000,000 for downtown subways. It is estimated that the income from the properties will permit these investments on a cash fare of 7 cents and ticket rate of 6⅔ cents on the surface lines and cash and ticket rates of 10 cents and 8⅓ cents, respectively, on the elevated lines, with a 2-cent charge for transfers between the two systems.

The fundamental principles underlying the new financial plan and ordinances are (1) service-at-cost; (2) city purchase; (3) home rule through a local commission; (4) a terminable permit that can be terminated by purchase of the consolidated transportation system by the city.

Engineer Outlines Plan

Under the proposed home rule powers, the city would determine the initial capital account of the new company, the initial construction program, the initial rates of fare, the initial percentage of gross receipts to be set aside for a renewal and depreciation fund and for a damage reserve fund. The local commission would be appointed by the Mayor with the approval of the City Council, and have the same powers and duties as now held by the Illinois commerce commission and local board of supervisory engineers.

As outlined by Major R. F. Kelker, Jr., city engineer, who with the help of the corporation counsel's office drafted the financial and legislative program, only such items as operating expenses, taxes, payments into renewal and damage reserve funds, cost of money in initial purchase price, cost of money for extensions and additions, payments into sinking fund, and compensation allowed to the new company, would comprise the "cost of service." Major Kelker said:

> The rates of fare and other revenues must produce a return sufficient, after payment of the charges enumerated, to leave a balance in the hands of the company. This balance will represent an overcharge to the car rider for service rendered and is paid to the trustee of the city purchase fund.
>
> It is obvious that such an overcharge cannot be returned to the individual car rider; consequently, it is held by the trustee for the benefit of the rider and may be used for two purposes only: (1) Purchase of the property by buying bonds issued for the initial capital value or for the purpose of extensions or by construction of a city-owned subway and (2) for the commutation of fares.

Comment Awaited

The city's $55,000,000 traction fund would be transferred to the city purchase fund and invested in first mortgages of the new company.

The new financial plan and proposed ordinances were submitted by the committee on Sept. 7 to elevated and surface lines officials and bankers. No comment, however, has yet been made regarding them. The enabling legislation, by which the provisions of the ordinances could become effective, is still being worked out by the committee.

Public Control of Eastern Massachusetts Continued

THE Eastern Massachusetts Street Railway stockholders, by a vote of 159,393 shares to 43,007, have approved the continuation for five years of public trustees for the suburban lines out of Boston, Mass.

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Recent Bus Developments

More Taxicab Troubles in Louisville

Although the city of Louisville, Ky., some months ago enacted a new ordinance barring jitney buses from the streets, and the Louisville Railway finally removed this thorn from its side, a new trouble has developed in the 25-cent taxicab. Just recently a company operating as the Gordon 25-Cent Cab Company, announced a new line of cars, operating at 25 cents for 2 miles; 40 cents for 3 miles and 50 cents for 4 miles, carrying one or four passengers for that price.

The Louisville Taxicab & Transfer Company, the old company, immediately purchased 50 Essex cars and met the price. On Sept. 2, the Dodds 25-Cent Cab Company announced that it had contracted for 100 Whippet cars, and was offering a service for 25 cents from any point within the city limits to the business section.

The Louisville Railway has placed a poster on its cars which reads: "Two Miles, 7 Cents. Four Miles??"

Two Rides for 25 Cents in Kansas City

The new bus fare rate on all trunk line buses in Kansas City, Mo., proposed by the Kansas City Public Service Company, was approved by the City Council at its regular meeting on Sept. 10. The new rate of two rides for 25 cents as opposed to 15 cents straight, the fare which has been in effect since last June, was scheduled to become effective on Sept. 15.

Rides Free in Salt Lake City

New trolley buses were placed in regular service on the Fourth East line of the Utah Light & Traction Company, Salt Lake City, Utah, on the morning of Sept. 9. All rides were free during the entire day and 17,700 passengers were carried. Ten coaches operate on this line on a regular ten-minute schedule with 12½-minute service on Sundays and 7½-minute service during rush periods.

Chicago-Joliet Service Started

In accordance with the permit recently issued by the Illinois Commerce Commission, motor coach service between Joliet, Ill., and downtown Chicago was started on Aug. 15 by the Chicago & Joliet Transportation Company, a subsidiary of the Chicago & Joliet Electric Railway. With a fleet of five new 29-passenger Yellow parlor coaches the company operates eight round trips daily between the two cities, a distance of approximately 40 miles. The running time in either direction is one hour and 40 minutes. The fare from terminal to terminal is $1; round-trip tickets, $1.60.

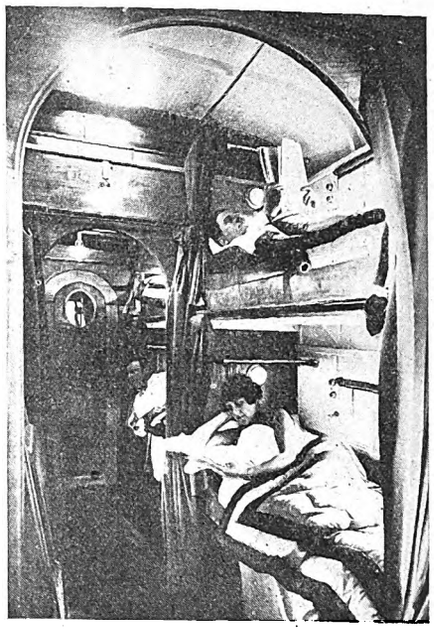
Sleeping Service in England

New route of 200 miles, recently established, attracts wide attention in Europe

SLEEPER bus service between London and Liverpool, a distance of about 200 miles, the first of its kind in England, and said to be the first in Europe, was started in August by the Albatross Roadways, Ltd. The new service—of a non-stop nature—will not compete with local railways, tramways or buses, but it threatens to compete with the services of the long distance steam railways. The fare for the journey is 25 shillings. This is about the same as the third-class railway fare.

The coach which is used has no very spacious windows, for it is intended for night-time service only. The body is 27 ft. long and 11 ft. high. The wheelbase is 17 ft. Extra large low pressure tires are fitted to minimize vibration. Sleeping accommodations are provided for twelve passengers. The journey is accomplished in about nine hours.

There are three compartments, or cabins, with four berths in each. Two of these are arranged one above the other on one side of a central gangway, and two on the other. Each berth is 6 ft. long by 2 ft. wide. To secure privacy, each one is provided with curtains. At the front of the vehicle are a lavatory and small kitchen. A steward serves tea and coffe as the journey nears its end. The position of the lavatory and the kitchen up front and the rubber matting on the floors are all designed to isolate the traveler from noise. Space for luggage is provided under the lower berths and in lockers below the floor level. Water is carried in a 20-gal. tank under the floor and is raised by hand pump to an overhead tank.



Night travelers attracted to bus accommodations

Greater space for the bunks could be secured by making the coach body 2 or 3 ft. longer, but if this were done the question of meeting the legal maximum dimensions would be raised. Connected with the berths are windows to secure ventilation, blinds, reading lamps and ash trays. Bell pushes are provided for summoning the steward.

The country traversed is, on the whole, fairly flat so that steep grades are infrequent. Hence there is little need of using the lower gears with their accompanying noise. Passengers report that the journey is comfortable and that their sleep in the new bus is not much disturbed.

Service is given three nights a week in each direction. Similar development of other routes is expected. The railways have met the increase in bus services with a promise to provide third-class sleepers in their night trains. In spite of strong agitation in the past, they have supplied sleeping accommodations to first-class passengers only. Second-class carriages were abolished long since but the third-class still remains.

The mammoth successor to the stage coach of Dickens, Irving and DeQuincey

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Financial and Corporate

Merger of Two Holding Companies Effected

The United Light & Power Company has acquired voting control of American Light & Traction Company it is revealed in the earnings statement of the former for the twelve months to July 31, 1928. According to the plans revealed both companies retain their separate identities, though United controls the American Company through ownership of a sufficient amount of stock. A statement by United Light & Power says:

Since our last published statement we have greatly increased our holdings of American Light & Traction Company stock. We now own a clear majority of the total voting stock of that company. It is our opinion that an accurate reflection of the situation requires that a consolidated earnings statement including consolidated earnings statement of American Light & Traction Company be substituted for the earnings statement heretofore published and this will be our future policy. American Light & Traction Company will continue to publish its independent earnings statements.

United Light & Power Company and subsidiaries, including consolidated earnings of American Light & Traction Company, for the twelve months ended July 31, 1928, showed income of $6,218,589 after taxes, depreciation, interest, amortization, subsidiary preferred dividends, etc., equal after prior preferred class A and B preferred dividends to $1.31 a share on the combined 3,132,691 shares of class A and class B common stocks outstanding.

Among the properties controlled by the United Light & Power Company is the Tri-City Railway & Light Company, whose subsidiaries own and operate street railway lines in Davenport, Muscatine, Rock Island, Moline and East Moline. The American Light & Traction Company controls the Muskegon Traction & Lighting Company and the San Antonio Public Service Company.

Greater Earnings Than Ever in Cleveland

Summary of events during 1927 presented by President Alexander to company stockholders shows that year recently closed was eventful one. Steady rise in income, but decrease in passengers carried. Bus a problem

OUTSTANDING events in the affairs of the Cleveland Railway, Cleveland, Ohio, during the year ended Dec. 31, 1927, besides earnings greater than ever before, were, according to President Alexander, the sale of stock in an amount sufficient to pay for all the probable needs of the system this year and next; the establishment of new relations with and between employees, including a pension system; the continuation of a rate of fare lower than generally obtaining elsewhere for comparable service despite a decrease in riding; the submission to the United States Board of Tax Appeals of a long continued protest of the claim of examiners for the Internal Revenue Department for additional income and excess profit taxes for the years 1913-1921 inclusive; the start toward acquiring additional facilities for the system; the beginning of negotiations for rapid transit in co-ordination with present services.

Minor events were the creation of the capital retirement sinking fund under the provisions of the new franchise ordinance, a decrease in the number of accidents, lowered costs of injuries and damages, maintenance and power, lessened labor turnover, experimental installation of new types of cars and motor coaches with their promise of improved service or lowered cost or both; the issuance of school passes to children in attendance at public and parochial schools. The high standards of maintenance and operation to which the company is long committed by its contract with the city to provide the best transportation at cost were maintained throughout the year.

Civic events of special interest to the company were the approval of bonds for the construction of a new high level bridge across the Cuyahoga Valley; the great Cleveland Industrial Exposition and the convention and exhibit of the American Electric Railway Association at the Public Auditorium; municipal elections in all of the communities served, which insure no radical changes in those local governments, and the creation, late in the year, of a non-partisan, non-political, citizens committee of Greater Cleveland for the purpose of studying and formulating a plan of metropolitan government.

INCOME ACCOUNT OF CLEVELAND RAILWAY

	Amount	Per Cent Increase	Per Car-Mile (Cents)
Based on Ordinance Allowances:			
Operating revenue	$18,706,290	3.91	50.89
Ordinance allowances	14,932,557	0.30*	40.63
Net operating revenue	$3,773,732	24.79	10.26
Non-operating income	214,363	37.75	0.58
Gross, less allowances	$3,988,095	25.42	10.84
Taxes	1,388,602	15.16	3.78
Net income	$2,599,493	31.69	7.06
Interest	2,138,155	5.72	5.82
Balance	$461,337	.....	1.24
Interest fund deduction	163,132	.....	0.44
Capital reduction sinking fund deduction	120,682	.....	0.32
Surplus	$177,523	.....	0.48
Based on Actual Expenses:			
Operating revenue	$18,706,290	3.91	50.89
Actual expenses	14,806,631	3.31*	40.28
Net operating revenue	$3,899,658	45.04	10.61
Non-operating income	214,363	37.75	0.58
Gross, less expenses	$4,114,021	44.64	11.19
Taxes	1,388,602	15.16	3.78
Net income	$2,725,419	66.34	7.41
Interest	2,138,155	5.72	5.82
Balance	$587,263	.....	1.59
Interest fund deduction	163,132	.....	0.44
Capital reduction sinking fund deduction	120,682	.....	0.32
Surplus	$303,449	.....	0.83

*Decrease.

CAR AND COACH MILEAGE OF CLEVELAND RAILWAY

	1926	1927	Per Cent Increase
Ordinance			
Motor cars	29,172,135	28,765,703	1.39*
Trail cars at 60 per cent	3,494,090	3,329,393	4.71*
Total	32,666,225	32,095,096	1.75*
Interurban cars	729,395	700,090	4.02*
Total car-miles	33,395,620	32,795,186	1.80*
Motor-coach-miles	3,098,511	3,523,666	13.72
Total	36,494,131	36,318,852	0.48*
Miscellaneous			
Chartered cars	8,407	7,757	7.73*
Freight and express cars	274,983	340,074	23.67
Newspaper cars	2,535	598	76.41*
Total	285,925	348,429	21.86
Chartered coaches	41,927	88,066	110.05
Total	327,852	436,495	33.14
Total revenue-miles	36,821,983	36,755,347	0.18*
Actual			
Motor cars	29,172,135	28,765,703	1.39*
Trail cars	5,823,484	5,548,986	4.71*
Total	34,995,619	34,314,689	1.95*
Interurban cars	729,395	700,090	4.02*
Total car-miles	35,725,014	35,014,779	1.99*
Motor coach-miles	3,098,511	3,523,666	13.72
Total	38,823,525	38,538,445	0.73*
Miscellaneous	327,852	436,495	33.14
Total actual miles	39,151,377	38,974,940	0.45*

*Decrease.

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EQUIPMENT RECORD OF CLEVELAND RAILWAY

	1926	1927	Decrease or Per Cent Increase*
Damaged cars	2,183	2,172	0.5
Armatures, fields and miscellaneous	4,517	4,062	10
Truck frames	26	14	46.1
Axles	15	7	53.3
Couplers put in service	34	13	61.7
Trolley poles	428	479	11.9*
Fenders	3,837	3,838	....
Car wheels	5,572	4,759	14
Brakeshoes	48,800	58,850	20.6*
Painted and varnished, cars, coaches and autos	1,040	1,000	3.84
Signs	9,384	9,929	5.81*
Touchups	2,707	2,445	9.68
Completed:			
Master mechanic and stores orders	2,635	2,673	1.5*
Jobs for other departments	1,813	1,581	12.7

Rebuilt three 1,200-type cars for rapid transit service.

Repaired and rebuilt 96 auto trucks.

Installed 23 top-deck floors in double-deck motor coaches.

Increased efficiency of operation, together with the decrease in mileage operated, affected the work of the equipment and buildings department like that of the power. The quality of the work done, was, as always, fine, and the manner of its doing, a large factor in the reduced maintenance costs. The accompanying table indicates the variety of this department's work and the extent of its reduction in labor and material costs.

The differences varied monthly from an increase of 1.04 per cent to a 4.59 per cent decrease, but by every standard of measurement was adequate to the demand throughout the year.

The number of rides in 1927 was only equal to that of 1916. The mileage that year was 32,240,683. Rides per car-mile then were 11.64; in 1927, 10.40. The average seating and carrying capacity of equipment is greater now than then, while the frequency and regularity of operation is as good, if not better.

Two independent traffic studies were conducted during the year. One in connection with the work of the fact finding committee studying sites for the proposed new bridge across the Cuyahoga Valley; the other, that the company might have the latest statistics and opinions for guidance in the proposed coordination with the projected rapid transit system of the Van Sweringen interests. Mr. Alexander says both surveys have been helpful and the city has met the decline in traffic with increased diligence in its daily traffic checks.

At the beginning of the year the route mileage operated by motor coaches was 63.88 miles, exclusive of operations in substitution for street car routes temporarily discontinued, and at the close of the year it was 68.78. The substituted mileage was 3¼ miles. The addition of route-miles and service on the older routes totals 10 per cent over a year ago. The cost of coach maintenance has been reduced approximately one-fourth, due to increased efficiency as the company's experience broadened. The department had at the close of the year a total of 134 coaches.

Car builders were asked to submit samples and, following the street railway exposition the first week of October 1927, the company commenced the operation of two units seemingly most adapted to its needs; one, an articulated unit, and the other, a four-motored, double-truck car like the company's standard car. After nearly three months' experiment the company ordered 25 of the articulated units. Final determination on the other 50 authorized by Council was made early in 1928.

Accidents

There was a decrease in street car accidents of 4 per cent, due in part to the decrease in car-miles operated and passengers carried, but largely to the effect of prevention work. There was an increase of 18 per cent in motor coach accidents due to the increase in mileage and traffic. There was a decrease in the total number of accidents of 556; but there was an increase in the number of personal injuries, the number of claims filed and of lawsuits brought against the company. More claims were settled, more lawsuits tried or settled than in any year of the company's history Thanks to the awakened mind of Cuyahoga County's jurors, the total cost of injuries and damaged remained about $900,000. In this connection President Alexander said:

I cannot resist saying here that it is our policy and the aim of our general counsel and all employees having to do with this work to make full payment for all damage caused by us, but also to resist all exaggerated and false claims to the utmost, because the monies we pay out on all claims are not ours, in the sense that they may be paid to you or invested in your behalf, but are ours in trust from our patrons to make proper satisfaction of real claims and any monies unexpended in such ways to be returned to the public in improved service or lower fare.

PERCENTAGE OF INCOME SPENT FOR MAINTENANCE, OPERATING EXPENSES, TAXES AND INTEREST BY THE CLEVELAND RAILWAY

	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
Maintenance	18.98	19.46	23.46	21.42	19.52	27.63	28.22	28.81	25.47	20.61
Obsolete equipment	5.98	3.96	2.83	2.78	2.73	1.32	0.00	0.00	0.00	0.00
Total	24.96	23.42	26.29	24.20	22.25	28.95	28.22	28.81	25.47	20.61
Operating expenses	51.34	50.67	62.36	53.99	51.21	59.21	53.46	55.87	58.86	57.64
Taxes	5.79	8.01	6.16	6.64	8.07	6.56	7.33	8.29	6.64	7.34
Interest on capital stock	13.65	11.01	10.27	9.75	10.16	10.54	9.98	10.03	9.67	9.82
Other interest	2.39	1.78	1.70	2.05	1.66	1.70	1.60	1.61	1.47	1.48
Total	98.13	94.89	106.78	96.63	93.35	106.96	100.59	104.61	102.11	96.89
Income	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Surplus	1.87	5.11	*6.78	3.37	6.65	*6.96	*0.59	*4.61	*2.11	3.11

* Deficit.

Traffic

The service measured in "Ordinance" car-miles was 571,129 less than the service of 1926, but the company operated 425,155 motor-coach-miles more than 1926. It varied monthly from an increase of 65,620 to a maximum decrease of 99,030. These decreases in service were due mainly, if not entirely, to lessened industrial activity throughout the community served. There were fewer rides by 4½ per cent than in 1926.

The company relaid 12 miles of single track during the year, of which more than two-thirds were necessitated by public work rather than condition of the rail.

President Alexander says that the employees responded almost as one man to the pension and insurance plans, previously mentioned in Electric Railway Journal, and in the last half of the year during which plan and department have been in effect 83 men were placed on pension. The average age of these employees is 72 years. How worthy the

SOME VITAL STATISTICS OF CLEVELAND RAILWAY

	Rides Per Car-Mile			Income			Income Per Ordinance Car-Mile (Cents)		
	Actual Car-miles	Rides	Rides per Car-mile	Passenger*	Operating†	Total‡	Passenger*	Operating†	Total‡
1916	35,673,567	375,382,748	10.523	$9,320,579	$9,521,555	$9,597,306	27.52	28.11	28.33
1917	37,648,670	398,378,894	10.581	9,975,306	10,176,125	10,256,514	27.85	28.41	28.63
1918	36,875,603	375,570,360	10.185	12,120,811	12,338,906	12,443,950	34.55	35.17	35.47
1919	38,234,436	402,808,820	10.535	15,223,059	15,459,234	15,660,945	42.14	42.79	43.35
1920	41,091,240	450,925,677	10.974	17,072,999	17,382,358	17,556,554	44.03	44.83	45.28
1921	37,118,227	399,429,666	10.761	17,336,685	17,607,718	17,797,947	49.13	49.90	50.44
1922	37,215,800	402,262,233	10.809	16,647,735	16,893,033	17,082,393	47.17	47.87	48.41
1923	38,282,973	417,405,905	10.903	16,091,100	16,342,103	16,494,311	44.67	45.37	45.79
1924	36,548,816	390,424,469	10.682	17,056,903	17,313,548	17,460,214	49.67	50.41	50.84
1925	37,203,461	387,671,132	10.420	16,980,164	17,214,528	17,379,181	48.58	49.25	49.72
1926	39,151,377	388,412,414	9.921	17,715,586	18,002,059	18,157,680	48.11	48.89	49.31
1927	38,974,940	370,651,915	9.510	18,392,862	18,706,290	18,920,653	50.04	50.89	51.48

* Including employees fares. † Passenger revenue, other transportation revenue and revenue from other railway operations. ‡ Including operating revenue and non-operating income.

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employees were of the action taken in their behalf will be apparent, the management believes, to anyone who glances over the list that accompanied the statement. The president referred to it as the honor roll of the company: "83 citizens each of whom has devoted nearly 40 years of his life to the furnishing of transportation to this community."

Franchises

The city of Cleveland passed ordinance No. 79613 amending the rate of fare section of the Cleveland contract so as to provide for half fare for school children. This ordinance was declined, but throughout the fall of the year an experiment was conducted with school passes. A card, good for transportation on all lines of the company, within certain hours, and on school days, is sold pupils of the public and parochial schools on application each week, at a price of 35 cents. Should the pupil ride to and from school only, the pass gives half fare. The experiment develops that the pass is used to a much greater extent than this so that each ride is on a basis of one-third fare or less. Further, it has not increased riding as the city and the company had hoped.

The hope expressed a year ago that Cleveland's satellite cities of East Cleveland, Cleveland Heights and Lakewood would grant new franchises in accordance with the recommendations of the Greater Cleveland Transportation Committee and these franchises would receive the city of Cleveland's approval, had not been realized at the time President Alexander wrote. Then, Cleveland Heights was in the process of drafting and submitting a new franchise, East Cleveland was prepared to follow and Lakewood informally had indicated that when the franchises of these cities had been approved by the city of Cleveland, it would fall in line. Cleveland Heights granted a franchise, but on application to the city of Cleveland for authorization to accept it, the company did not receive approval. With the determination of the Cleveland Heights franchise so long pending, the situation in the other cities perforce remained in *status quo*.

Under the existing East Cleveland franchise the rate of fare is to be determined at five-year intervals. The present five-year period ends in June, 1928. Inasmuch as the rate in that city is now the Cleveland rate, the company has notified the city that it desires to arbitrate the rate. By the terms of the East Cleveland franchise the rate of fare may not be less than the Cleveland rate, so the company was hopeful of a favorable decision.

The Cleveland Council informally indicated its feeling that suburban franchise contracts and service requests should be held in abeyance until rapid transit plans were further advanced. In November the company commenced a traffic survey since the management is intent to arrive at an early conclusion, "that this vexatious and costly question of our suburban relations may be finally settled."

President Alexander says:

The effect of traffic abuses and delays, of injuries and damages, while being minimized, has not been removed and is still reflected in our expenses. Changing industrial and traffic conditions tend to increase the cost of operation. The decrease in the number of our riders is not apparent during the rush hours and that service at the peak of traffic demand is furnished at peak prices. In other words, it is scarcely possible to diminish service in exact ratio with a lessened demand so that the expense of operation decreases as does the revenue. Improvement of travel or the return of a better balance between rush hour and non-rush hour riding will, we believe, make the allowance for maintenance and operation sufficient to meet the expense chargeable against it.

Soon after the meeting of the stockholders in 1927 the management agreed with the city upon improvements and additions to the property, long deferred because of financial conditions, and undertook to provide them. Specifically, they were:

100 street cars at an estimated cost of...	$1,200,000
50 motor coaches at an estimated cost of	600,000
Four 117th Street operating station....	350,000
West automatic substations equipped...	1,000,000
Track in Pearl, State and Broadview Roads	262,000
Service buildings	207,500
Miscellaneous	20,000
Total	$3,639,500

The following is the schedule of rates in cents per hour paid trainmen from the taking effect of service at cost:

Beginning March 1, 1910, first year of service 23, second year 25, thereafter 26.
Beginning June 15, 1910, first year 27, thereafter 30.
Beginning May 1, 1915, first year 29, thereafter 32.
Beginning May 1, 1916, first year 31, thereafter 34.
Beginning May 1, 1917, first year 32, thereafter 35.
Beginning May 1, 1918, first three months 43, next nine months 46, thereafter 48.
Beginning June 1, 1919, first three months 55, next nine months 58, thereafter 60.
Beginning May 1, 1920, first three months 70, next nine months 73, thereafter 75.
Beginning May 1, 1921, first three months 55, next nine months 58, thereafter 60.
Beginning May 1, 1922, first three months 50, next nine months 53, thereafter 55.
Beginning May 1, 1923, first three months 55, next nine months 58, thereafter 60.
Beginning May 1, 1925, first three months 60 ,next nine months 63, thereafter 65.
Beginning May 1, 1926, first three months 65, next nine months 68, thereafter 70.

Section 23 of the Cleveland franchise, ordinance No. 70561-A, reads in part as follows:

"The maximum rate of fare for a single continuous ride within the present limits of the city of Cleveland, whether through a suburban city or not, in one direction, over any route of the said company, shall be 10 cents cash fare, 1 cent for transfer, and no rebate, and beyond and including said maximum rate of fare, the following schedule or scale of fares is hereby established:

"(*a*) 10 cents cash fare, six tickets for 50 cents, 1 cent for transfer, no rebate;
"(*b*) 9 cents cash fare, six tickets for 50 cents, 1 cent for transfer, no rebate;
"(*c*) 8 cent cash fare, seven tickets for 50 cents, 1 cent for transfer, no rebate;
"(*d*) 7 cent cash fare, eight tickets for 50 cents 1 cent for transfer, no rebate;
"(*e*) 6 cent cash fare, nine tickets for 50 cents, 1 cent for transfer, no rebate;
"(*f*) 5 cent cash fare, ten tickets for 50 cents, 1 cent for transfer, no rebate;
"(*g*) 5 cent cash fare, eleven tickets for 50 cents, 1 cent for transfer, no rebate;
"(*h*) 5 cent cash fare, twelve tickets for 50 cents, 1 cent for transfer, no rebate;
"(*i*) 4 cent cash fare, thirteen tickets for 50 cents, 1 cent for transfer, no rebate;
"(*j*) 4 cent cash fare, seven tickets for 25 cents, 1 cent for transfer, no rebate;
"(*k*) 4 cent cash fare, seven tickets for 25 cents, 1 cent for transfer, 1 cent rebate;
"(*l*) 4 cent cash fare, three tickets for 10 cents, 1 cent for transfer, no rebate;
"(*m*) 4 cent cash fare, three tickets for 10 cents, 1 cent for transfer, 1 cent rebate;
"(*n*) 3 cent cash fare, 1 cent for transfer, no rebate;
"(*o*) 3 cent cash fare, 1 cent for transfer, 1 cent rebate;
"(*p*) 3 cent cash fare, two tickets for 5 cents, 1 cent for transfer, no rebate;
"(*q*) 3 cent cash fare, two tickets for 5 cents, 1 cent or transfer, 1 cent rebate;
"(*r*) 2 cent cash fare, 1 cent for transfer, no rebate;
"(*s*) 2 cent cash fare, 1 cent for transfer, 1 cent rebate."

The rates of fare actually in effect follow:

Cleveland:
Beginning March 1, 1910, rate *n*.
Beginning June 1, 1911, rate *o*.
Beginning Sept. 1, 1914, rate *n*.
Beginning Dec. 15, 1917, rate *m*.
Beginning Dec. 26, 1917, rate *l*.
Beginning April 3, 1918, rate *k*.
Beginning April 10, 1918, rate *j*.
Beginning Aug. 4, 1918, rate *f*.
Beginning July 6, 1919, rate *g*.
Beginning Dec. 16, 1919, rate *h*.
Beginning May 12, 1920, rate *f*.
Beginning Nov. 14, 1920, rate *e*.
Beginning Aug. 1, 1922, rate *f*.
Beginning March 1, 1923, rate *g*.
Beginning Sept. 1, 1923, rate *f*.
Beginning Dec 11, 1923, rate *e*.
Beginning Oct. 15, 1926, rate *d*.

REVENUE AND SERVICE EQUIPMENT OF CLEVELAND RAILWAY AS OF DEC. 31

	1926	1927	Increase
Revenue Equipment:			
Pay-within cars	353	348	5*
Center-entrance, center exit cars	202	202	..
Front-entrance, center exit cars	407	407	..
Articulated cars	....	2	2
Center-entrance trailers	494	494	..
Single-deck auto coaches	61	72	11
Double-deck auto coaches	50	53	3
Total	1,567	1,578	11
Service equipment	274	277	3
Total revenue and service equipment	1,841	1,855	14

MILES OF TRACK OF CLEVELAND RAILWAY AS OF DEC. 31, 1927

	1926	1927	Number of Miles—Increase	Decrease
Main line	337.0114	337.4322	0.4208	.....
Carhouses, yards and loops	44.9223	45.0488	0.1265	.....
Total owned by us	381.9337	382.4810	0.5473	.....
Operated, but owned by:				
City of Cleveland	6.9733	6.9112	.....	0.0621
County of Cuyahoga	1.8809	1.8809	.....	.....
The Cleveland Interurban Railway	20.2202	20.2202	.....	.....
The Cleveland Southwestern Railway & Light Company	6.8742	6.8742	.....	.....
Total	35.9486	35.8865	0.5473	0.0621
Total miles operated	417.8823	418.3675	0.4852	.....

*Decrease.

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East Cleveland:
Beginning June 20, 1918, 5 cents.
Beginning Nov. 14, 1920, 6 cents cash, nine tickets for 50 cents.
Beginning Aug. 1, 1922, 5 cents.
Beginning June 19, 1923, 6 cents cash, nine tickets for 50 cents.
Beginning Oct. 15, 1926, 7 cents cash, eight tickets for 50 cents.

Cleveland Heights:
Beginning March 1, 1910, 5 cents.
Beginning Feb. 14, 1921, 6 cents cash, nine tickets for 50 cents.
Beginning Oct. 15, 1926, 7 cents cash, eight tickets for 50 cents.

Lakewood:
Beginning May 1, 1915, local ride, 3 cents; ride into or from Cleveland, 5 cents.
Beginning May 22, 1925, local ride, 3 cents; ride into or from Cleveland 6 cents cash, nine tickets for 50 cents.
Beginning Oct. 15, 1926, local ride, 3 cents; ride into or from Cleveland, 7 cents cash, eight tickets for 50 cents.

Of the future the president said:

In looking to the future this year we are in a most unusual and favored position. The condition of the system is good, physically, financially and in its relations with the public and its employees. We are abundantly able to meet all of the present transportation needs of Greater Cleveland. Not since the commencement of operation under service-at-cost have we been better able to carry out our part of that agreement.

The same is, we think, true of our partner, the city. Its capacities and powers have expanded and grown even as have our facilities. Originally the city, while reserving to itself the broadest and most complete control of the service to be rendered by us and of regulation of our conduct in supplying that service, had only a negative part in the fixing of the cost of service. Today it may cause savings, order increased earnings and effect more direct economies than could the company ten or more years ago. When, in the original grant, the city reserved the right to fix the service and included specifically the right to fix headways and stops it could not foresee that traffic congestion would actually do the fixing. If the city continues indefinitely to regulate and prescribe service as it did nearly twenty years ago without first removing the real dictator of service, traffic congestion, it will receive a decreasingly best transportation, at a constantly increasing cost.

More than $900,000 of last year's car fares went to the satisfaction of injuries and damages, the majority of which were caused by traffic situations which the city controls. The parking of vehicles on main thoroughfares, especially in the downtown or business areas, is the largest single factor in the cost of transportation, which the city controls. The carriage of city passengers by interurban bus companies, forbidden the interurban electric cars almost at the beginning of service-at-cost, is another factor, although a minor one, in the cost of service, which the city controls. Traffic has been so rapidly growing a burden on the city that it is not to be wondered at that the car rider and the effect on his fare have been lost sight of at times. A reawakening to the rights of the car rider is imminent; a curbing of unfair, costly and needless uses of the street is the most pressing need of the immediate future.

Until the rapid transit plans are determined none of the suburban cities in which we operate will take its proper place in the requirements of Greater Cleveland. I am confident that with the basis of co-ordinated and unified service established the administrations of all of the communities involved will act promptly in the solution of the questions confronting us until the arrival of the larger and faster form of transit.

Increase in B.M.T. Net

After providing for all maintenance charges, taxes and reserves for depreciation the gross income of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., for the fiscal year ended June 30, 1928, was $14,565,561, compared with $14,143,305 for a similar period ended in 1927. Expenditures for maintenance-of-way and structure and of equipment, including reserves for depreciation, continued in excess of 24 per cent of total operating revenues. Net income was $6,595,455 against $6,348,445 for the year ended June 30, 1927.

The decade ended in 1928 shows an increase in rapid transit traffic of 153 per cent and a substantial increase in surface line travel.

COMPARATIVE STATEMENT OF EARNINGS AND EXPENSES OF THE BROOKLYN-MANHATTAN TRANSIT SYSTEM FOR YEAR ENDED JUNE 30

	1928	1927
Revenue from transportation:		
Passenger revenue	$45,425,465	$44,633,439
Freight revenue	489,054	588,056
Chartered car revenue	419	560
Miscellaneous transportation revenue	262	357
Chartered bus revenue	.....	1,622
Total revenue from transportation	$45,915,202	$45,224,035
Other street railway operating revenues:		
Advertising	584,689	570,645
Other car and station privileges	694,784	677,597
Rent of buildings and other property	180,406	162,428
Rent of equipment	37,007	7,608
Rent of tracks and terminals	22,504	21,804
Sale of power	10,126	11,266
Miscellaneous receipts	21,883	35,207
Total other street railway operating revenues	$1,551,401	$1,486,557
Total street railway operating revenues	$47,466,603	$46,710,592
Operating expenses:		
Maintenance of way and sitructure	$4,606,630	$4,582,742
Mantenance of equipment	6,972,181	7,053,983
Operation of power plant	3,364,184	3,384,736
Operation of cars—trainmen's wages	7,418,500	7,156,691
Operation of cars—other expenses	4,751,225	4,508,311
Damages	1,269,619	1,471,288
Legal expense in connection with damages	250,646	241,102
General law expenses	92,442	79,064
Other general expenses	1,543,850	1,546,151
Freight expenses	303,376	364,101
Total operating expenses	$30,572,658	$30,388,173
Net revenue from operation	$16,893,944	$16,322,418
Taxes accrued on operating properties	3,367,443	3,223,608
Operating income (*carried forward*)	$13,526,501	$13,098,810
Operating income (*brought forward*)	13,526,501	13,098,810
Non-operating revenue:		
Rents accrued from lease of road	66,546	63,570
Miscellaneous rent revenues	115,997	114,424
Interest revenues	841,690	748,343
Dividend revenues	6,443	7,886
Miscellaneous	42,773	140,032
Total non-operating revenues	$1,073,451	$1,074,256
Non-operating revenue deductions:		
Rent expense	4,347	2,473
Non-operating taxes	30,044	27,288
Total non-operating revenue deductions	$34,391	$29,761
Net non-operating income	$1,039,060	$1,044,495
Gross income	$14,565,561	$14,143,305
Income deductions:		
Interest deductions	$7,736,600	$7,521,032
Rent for lease of other road and equipment	25,000	25,000
Other rent deductions	199,859	239,209
Sinking fund accruals	658	658
Amortization	4,231	3,125
Total income deductions	$7,966,350	$7,789,025
Balance	$6,599,211	$6,354,280
Less—accruing to minority interests	3,755	5,834
Net income	$6,595,455	$6,348,445

PASSENGERS CARRIED

Fiscal Year	Surface	Rapid Transit	Totals
1918	255,569,584	265,400,020	520,969,604
1919	251,893,227	313,933,642	565,826,869
1920	278,832,742	380,190,890	659,023,632
1921	223,006,425	406,695,310	629,701,735
1922	250,412,364	446,384,508	696,796,872
1923	262,992,795	482,584,090	745,576,885
1924	266,421,409	539,069,076	805,490,485
1925	271,800,914	593,368,990	865,169,904
1926	269,233,866	623,099,695	892,333,561
1927	269,928,710	658,271,663	928,200,373
1928	272,782,698	671,202,522	943,985,220

Dissolution Sought by Ocean Electric

The Ocean Electric Railway, which formerly operated lines on the Rockaway peninsula, applied on Sept. 5 to Supreme Court Justice Druhan in Brooklyn, N. Y., for permission to dissolve and wind up its corporate existence. All lines of the company were discontinued three years ago except one running from Hammels to Beach 149th Street, Neponsit, Long Island.

Capital stock of the company, totaling $350,000, is owned entirely by the Long Island Railroad. The directors of the company stated that operation was made unprofitable by competing bus lines.

Ithaca Traction Sold

At a referee's sale held in Ithaca, N. Y., on Sept. 7, the property of the Ithaca Traction Corporation was sold to Frank L. Morse, of the Morse Chain Company, of that city, for $150,000. The sale was held in accordance with a judgment rendered by the Court of Appeals in favor of the bondholders of the company. Mr. Morse said that the plan was to improve and operate the system.

Realize $2,575,300 in Detroit

The properties of the Detroit United Railway and the Detroit, Munroe & Toledo Short Line Railway, Detroit, Mich., were sold for $2,575,300 at public auction on Sept. 12 to Edward W. Durner of Princeton, N. J., and James T. Harrigan of New York, representatives of the organization committee. The sale was conducted by William S. Sayres, Jr., standing master-in-chancery of the United States District Court, under a foreclosure order issued July 25, last.

Reorganization terms of the Detroit United Railway were reviewed in ELECTRIC RAILWAY JOURNAL, issue of May 5, 1928, page 754.

The Detroit United Railway and the Detroit, Monroe & Toledo Short Line Railway will be known as the Eastern Michigan Railway.

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Personal Items

F. C. Payne New Superintendent of Chicago's Accident Department

Frederick C. Payne has been appointed superintendent of the department of accident investigation of the Chicago Surface Lines, Chicago, Ill. He succeeds Frank J. Gatrell, who died last winter. Mr. Payne entered electric railway service in 1911 with the Chicago Railways as a statement man. He has been connected with the same department of the company continuously since that time except during his service as adjutant for the 69th Infantry Tenth Division in the World War. After his return from the service he was appointed claims attorney and was made acting superintendent of the department upon the death of Mr. Gatrell.

Mr. Payne was born in Chicago in 1887. After his graduation from the Illinois College of Law in 1910 he was associated with his father in law practice under the name of Payne & Payne.

Commonwealth Power Elects Officers

B. C. Cobb, president of the Tennessee Electric Power Company, was elected president of Commonwealth Power Corporation at the organization meeting of the board of directors held recently in New York City. Mr. Cobb succeeds George E. Hardy, who was elected to the newly created office of chairman of the board of directors. Mr. Cobb has been an important figure in public utility affairs for many years and has been identified with the Tennessee Electric Power Company for the last six years. As vice-president of the corporation since its organization and the operative executive, he has been largely responsible for the successful growth of the Commonwealth Power Corporation system of properties in Tennessee, Ohio, Indiana, Illinois and Michigan.

T. A. Kinney was elected vice-president of the corporation. Mr. Kinney is well known as vice-president of the Tennessee Electric Power Company.

Transportation Department in St. Louis Rearranged

A reorganization in the transportation department of the St. Louis Public Service Company, St. Louis, Mo., carries with it the promotion of seven men to higher positions and the rearrangement of a personnel which has been retained for some years past. The new plan, effective Sept. 1, and approved by Vice-President and General Manager Greenland looks to economy and greater improvement in the operation of the cars.

A. J. Fink, as Director of Transportation, will be in authority. Lined up after him is H. O. Butler superintendent of transportation. The seven promotees have been appointed as follows:

P. Concannon, superintendent of schedule maintenance.

Bryan Williams, chief traffic engineer.

J. H. Rippen, superintendent of methods.

T. Lane, acting principal instructor.

A. W. Taylor, acting superintendent, Manchester Station.

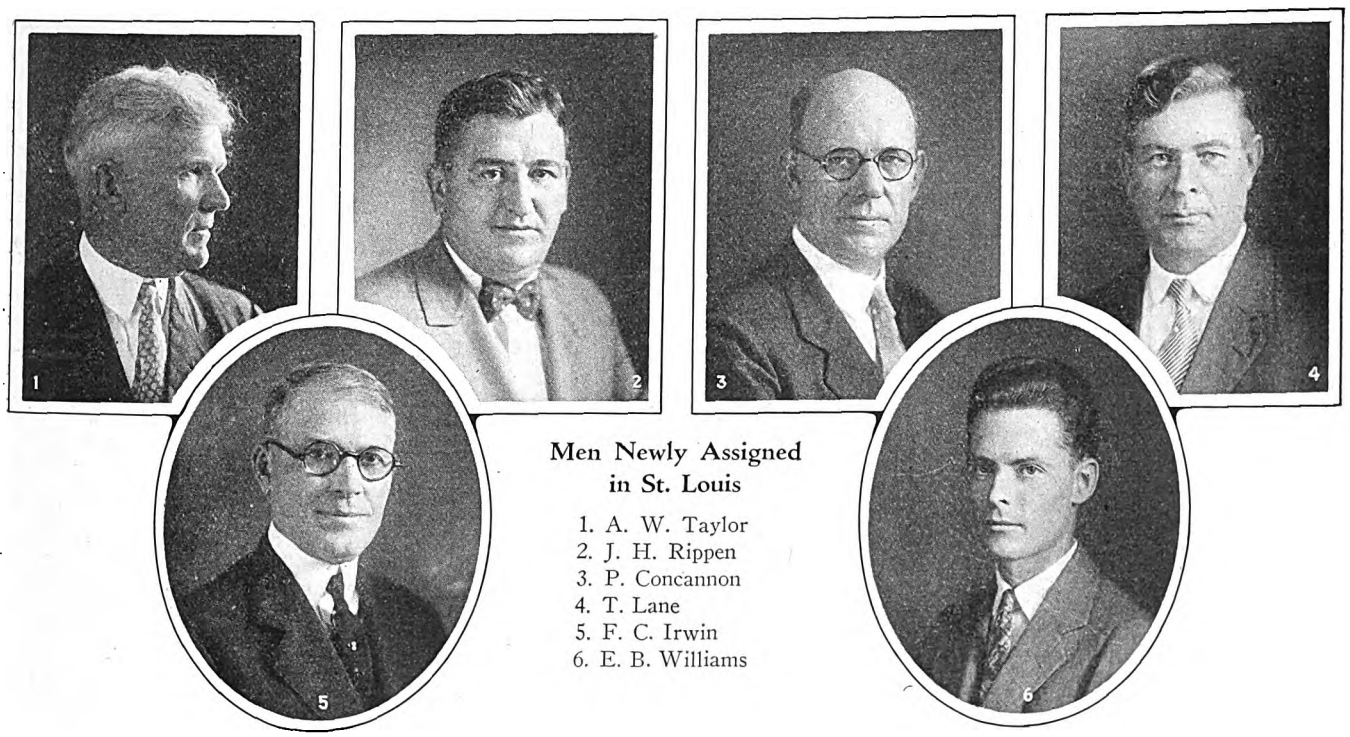
F. C. Irwin, superintendent, Kossuth Station.

W. P. January, superintendent, Park Avenue Station.

P. Concannon moves up from assistant superintendent of transportation, a position that he has held for many years.

Bryan Williams formerly was associate superintendent at Newstead over a period of about two years; John Rippen rose from the position of foreman at North Broadway and Manchester stations; T. Lane served over a long period as instructor of new men entering the service as motormen and conductors at Newstead; F. C. Irwin came up from the position of foreman at Hodiamont; W. P. January from foreman at Newstead, and A. W. Taylor from foreman at Manchester.

Under the old order of things, the street railway system was divided into eight divisions with four of the division superintendents having jurisdiction over all lines operating out of two car stations in each case. Under the new order there will be one superintendent performing the duties of that office at each station, or a total of thirteen superintendents against eight heretofore.



Men Newly Assigned in St. Louis

1. A. W. Taylor
2. J. H. Rippen
3. P. Concannon
4. T. Lane
5. F. C. Irwin
6. E. B. Williams

PHILIP KREMER, staff engineer of the Berlin Street Railway, Berlin, Germany, is leaving Europe for a five weeks trip in this country. He will arrive on the steamship *Paris* about Sept. 18 and will attend the Cleveland convention. Mr. Kremer is coming especially to study the latest developments in cars here. Also coming to this country on the same ship is a high official in the Berlin Police Department, Mr. Schuppau, who will make the same trip as Mr. Kremer, studying traffic conditions particularly.

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Track and Line Market Active

Several track projects contemplated. Line material orders large. A number of cars being remodeled or re-equipped. Rolling stock purchases contemplated

PURCHASES of both track and line materials indicate an active market in this equipment during the past 30 days. Particularly noticeable is the activity of the line market which for some time has been apparently dormant. Twin City Rapid Transit Company, Minneapolis, Minn., has ordered 2 miles of 500,000 C.M. 600-volt feeder cable, 3,024 ft. of 1,000,000 C.M. lead-covered cable, one hundred 35-ft. treated cedar poles and one hundred 30-ft. treated cedar poles. Two hundred 15-in. marathon type clinch ears with $\frac{5}{8}$-in. boss for 00 round wire, 100 two-bolt galvanzied guy wire clamps, 200 type P-2N porcelain strain insulators and six type A-4 sectional insulators for 00 trolley have been ordered by the Grand Rapids Railroad, Grand Rapids, Mich. Inquiries have been made by the Western Pacific Railroad, San Francisco, Cal., for one carload of strand.

Pittsburgh Railways, Pittsburgh, Pa., has ordered 20-8 Deg. to 10 Deg. LH Universal trolley frogs, 2,000 ft. of three conductor cable, 200 two-pin 4x5x36-in. crossarms, 50 double curve suspensions, 100 spring lock mining suspensions, 50-00-90 Deg. crossovers, 300 galvanized corner feeder insulators for 1,000,000 C.M. strand, 400 straight line insulators for 500,000 C.M. strand and 500 galvanized insulator pins for W crossarms.

Lehigh Valley Transit Company, Allentown, Pa., has placed orders for 1 mile of 00 grooved copper trolley wire, two carloads of 30-ft. class A Chestnut poles, one carload of 40-ft. class A chestnut poles. Other equipment ordered by this company includes 750 marathon trolley ears No. 14444, 300 marathon trolley ears No. 14441, 250 marathon trolley ears No. 14440 and 50 marathon feeder ears No. 14733.

Many Orders for Track Materials

The Duluth Street Railway, Duluth, Minn., has placed orders for 150 gross tons of 7-in. 93-lb. rail, 20 gross tons of 7-in. 114-lb. rail and 3,000 white oak ties. Tie plates, screw spikes, tie rods and Thermit welding material for the above rail has also been ordered. Grand Rapids Railroad has ordered 2 kegs of $\frac{3}{8}$x8-in. boat spikes and 50 pairs of splice bars for 100-lb. A.R.A. A rail. Seven hundred Thermit rail welding portions section 8040 and one Atlas track grinder have been ordered by the Twin City Rapid Transit Company. Ottawa Electric Railway, Ottawa, Ont., has ordered 2,000 hemlock ties and 40 tons of section 103-287 A rail.

Seven hundred gross tons of 122-lb. grooved guider rail, B.S. section 122-407, have been ordered by the Toronto Transportation Commission, Toronto, Ont. The Public Service Company St. Louis, Mo., is reconstructing the tracks on Franklin Avenue from Third Street west to a point near Twelfth Street at an estimated cost of $150,000.

The Worcester Consolidated Street Railway, Worcester, Mass., has completed the installation of a new crossover on Main St. consisting of two switches, two mates and two frogs at an approximate cost of $3,500. Work has been started by this company on the renewal of the crossover on Main Street, near Ionic Avenue, consisting of two switches, two mates and two frogs. It is estimated the cost will be approximately $3,500. The installation of two new solid manganese crossings over the N. Y., N. H. & H. R.R. at the South Works has been completed. Also the installation of one tongue switch with gutter on Millbury Street, and two switches, two mates and gutters at T. O. No. 168 on Greenwood Street, near Tatman Street, at an approximate cost of $6,547. It is contemplated to renew a switch and mate at Harrington Corner at an approximate cost of $1,000.

The Memphis Street Railway, Memphis, Tenn., will complete its Jackson Avenue extension by Oct. 15. The Holyoke Street Railway Company, Holyoke, Mass., is about to replace its tracks on High Street from Cabot to Sargeant Street, on Hampden Street from Maple to High Streets, and on Race Street, from Dwight to Main Streets.

Contemplated Track Purchases and Expansion Programs

The New York Central Railroad, New York, N. Y., is arranging an expansion program at its Mott Haven yards, in the electrified division, to cost $2,000,000.

Contemplated purchases by the Pittsburgh Railways include 500 tons of 9-in. 134-lb. rail and 10,000 white oak ties 6x8 in. by 8 ft. This company has ordered 500 kegs of $5\frac{1}{2}$x$\frac{9}{16}$ in. spikes, 5,000 tie rods, 500 tons of 9-in. 134-lb. rail, 400 tons 7-in. 122-lb. rail and 10,000 white oak ties 6x8 in. by 8 ft.

One solid manganese frog for a crossover has been ordered by the Lehigh Valley Transit Company. This company also has placed orders for 500 ETS $5\frac{1}{4}$-in. 0000 rail bonds, 100 E 38-in. 0000 rail bonds, 100 E 44-in. 0000 rail bonds, 100 E 72 in. 0000 rail bonds and 100 A-2-72 in. 0000 rail bonds.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been authorized to construct a car line from 47th Street to 60th Street, on North Avenue. Chicago, South Shore & South Bend Railroad has completed the installation of automatic safety block signal between Chicago & South Bend. Three Rivers Traction Company, Three Rivers, Quebec, is proposing to relay about 2,200 ft. of track. London & Port Stanley Railway, London, Ontario, has been authorized to provide increased track accommodation for the Century Coal Company. Montreal Tramways, Montreal, Quebec, proposes to construct 3.98 miles of track in various parts of the city.

Car Equipment and Remodeling Materials

Recent purchases of car equipment have been made by several companies. Lehigh Valley Transit Company has ordered 24 motormen's seats, 60 car seats 36 in. long, six 66 in. long cushions and backs, six 36 in. cushions and backs and sixteen line switches for the 900 type cars. Pittsburgh Railway is remodeling thirty-seven 5000 type cars for one-man operation and fifteen 4700 type cars for one-man operation.

Grand Rapids Railroad has remodeled one Birney safety car and has ordered 1,080 23-watt, 500-volt car lights and headlights, 250 lb. of $\frac{9}{32}$-in. diameter spot cord, 30 gal. of paint and varnish, 576 lb. of cold rolled steel, 1,546 lb. of mild steel bars, three barrels of car journal oil and 800 lb. of common colored waste.

Ten cars are being remodeled by the Duluth Street Railway, for one-man operation. These cars will be equipped with leather upholstered seats, Simplex safety devices and National Pneumatic door equipment. Twin City Rapid Transit Company has ordered 100 gear blanks for G. E. 203 motors, 610 sheets of 26x28 in. plate glass, 610 sheets of 20x28 in. D. S. A. glass, 600 helical equalizer springs 4 in. O.D. by $11\frac{1}{2}$ in. long and 600 helical equalizer springs $6\frac{1}{4}$ in. O.D. by $10\frac{3}{4}$ in. long. Illinois Terminal System is starting work on the construction of four 80-ton locomotives. The installation of multiple-unit control has just been completed on four of the system's parlor cars. Louisville Railway, Louisville, Ky., will change the gage on 23 one-man safety cars recently purchased from the Transit Equipment Company, New York, N. Y.

Rolling Stock

Pittsburgh Railways has received fourteen of the fifteen cars ordered from the St. Louis Car Company. Monongahela-West Penn Public Service Company, Fairmont, W. Va., in

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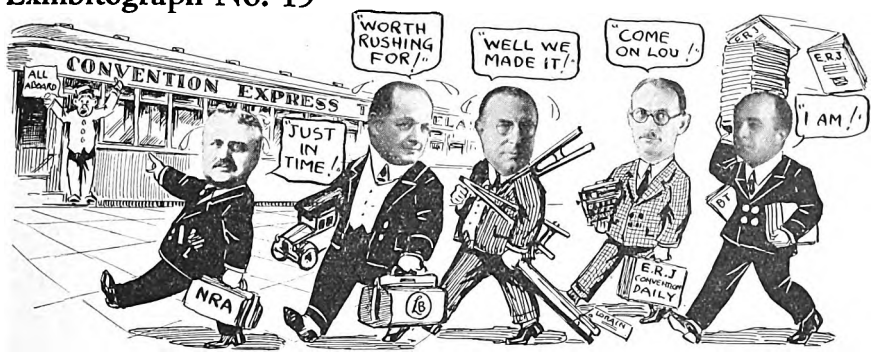
Exhibitograph No. 19



All aboard for the Big Show! Looks like there's going to be something doing—Better be there!

announcing its purchase of ten cars from the G. C. Kuhlman Car Company, stated that it expected to make other purchases for the Marietta City and the Marietta & Beverly interurban lines.

Hamilton Street Railway, Hamilton, Ontario, has been inquiring for ten double-truck cars similar to those purchased last year. Saskatoon Municipal Railway, Saskatoon, Sask., Canada, has ordered four double-truck cars from the Ottawa Car Manufacturing Company. Calgary Municipal Railway has ordered three cars from the Canadian Car & Foundry Company. Toronto Transportation Commission has ordered six model W 23-passenger buses from General Motor Truck Corporation.

International Bus Corporation, a subsidiary of the International Railways Buffalo, N. Y., has ordered ten Yellow Coach gas-electric buses. Pacific Northwest Traction Company, Seattle, Wash., has ordered two A.C.F. 21-passenger parlor coaches. Community Traction Company, Toledo, Ohio, has ordered ten urban twin coaches. Illinois Power & Light Corporation has purchased four A.C.F. parlor coaches. United Electric Railways, Providence, R. I., has ordered twelve urban Twin Coaches.

Buildings and Shop Equipment

Twin City Rapid Transit Company has ordered high-pressure greasing equipment, lubricating oil dispensers and a motor-driven Viking oil pump, an engine oil drain, a steam cleaner and bus washing equipment, one Wallace Radial cutoff saw and one Wallace Universal saw. Toronto Transportation Commission has orderel one No. 12 Cowdry Brake Testing Machine.

A contract for the purchase of electrical equipment for a 750-kw. rotary converter fully automatic substation has been let by the Pittsburgh Railways. West Penn Electric Company, Pittsburgh, Pa., has started construction of a 60x60-ft. building in the rear of its Uniontown carhouse. This building will house the machine shop for the repair of substation equipment, the shops of the relay department and will be a garage for automobile rolling stock

St. Louis Public Service Company has consolidated its De Baliviere and its Hodiamont Avenue carhouses. The City Light & Traction Company, Sedalia, Mo., plans improvements in its power plant to cost $30,000. The Pennsylvania-Ohio Power & Light Company, Youngston, Ohio, plans a substation to cost $100,000. Levis Tramways Company, Levis, Quebec, will erect a stone and brick warehouse and is building an office building. Montreal Tramways is building a substation at Rockfield, an extension to its paint shop at the Youville shops and an office extension at the St. Henri garage.

Cars Being Built for Illinois Central

Ten suburban type motor cars and ten trailer cars are being built for the Illinois Central Railroad, Chicago, Ill., by the Pullman Car & Manufacturing Corporation. Notice of this order was made in the May 26 issue of the Journal.

The center sills of the underframes of these cars are rolled channels. Side sills are angle with all pressed-steel cross-members for floor supports, crossties, bolsters and end sills. The floor sheets are of 0.038-in. sheet steel with pressed-steel longitudinal floor supports. The superstructure posts are all of pressed-steel members and the side and end sheets are ⅛-in. copper-bearing steel. In the roof the carlines are U shape in one piece from side plate to side plate. The roof sheets and exterior deck panels are of aluminum alloy.

The seating capacity of each car is 84, having 34 cross seats and four longitudinal end seats. All seats are covered with rattan. The main finish panels throughout the car are of aluminum with Agasote for the headlining panels. All doors are of aluminum with an alloy for proper hardness. Sliding doors are hung with ball-bearing hangers and tracks. The side doors are provided with electrically operated engines that are controlled by the conductor from either end of the car. These side doors at the closing edge are provided with a buffer of flexible brass covered with sheet rubber to protect passengers from injury. The side doors are also equipped with a contact switch that operates throughout the train, signaling the operator when the doors are closed.

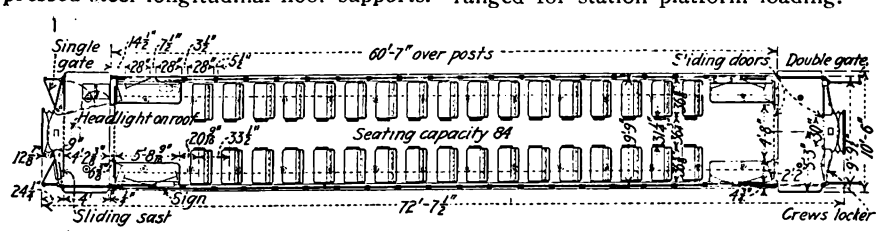
The cars will be equipped with collapsible style gates to prevent passengers from falling between cars when on a station platform. In addition to having a sliding end door, cars at the end of each unit will also be provided with the regular folding gate as an additional safety measure. The vestibules are of a wide type entirely inclosed, ends of the car being provided with canvas diaphragm and the usual vestibule curtain.

Electric heaters are placed under each crosswise and longitudinal seat and two in the motorman's cab. These heaters are operated with 1,500-volt current and in the passenger compartment are thermostatically controlled.

On the sides of the car the removable type of brass sash will be used. On previous cars all sash were of wood. For a unit of two cars (motor and trail car) at one corner of the trail car a three-tread flight of steps is provided. All other platforms are arranged for station platform loading.

DIMENSIONS OF MOTOR AND TRAILER CARS

Length over buffer	72 ft. 7¼ in.
Length over end sills	60 ft. 6½ in.
Width over side sheets	9 ft. 9¾ in.
Width over platform plates at side doors	10 ft. 6 in.
Width of side loading door openings	4 ft. 0 in.
Width of body end door openings	4 ft. 0 in.
Width of aisle space at seat ends	2 ft. 7¼ in.



Floor plan of ten motor cars being built for the Illinois Central Railroad. The seating arrangement of the motor cars and trail cars is similar

The couplers are of self-centering type except between the two cars of the unit. The couplers with their connections complete the connection between cars for pulling, air and electric features and also contain the friction draft spring in their construction. Couplers can be operated from inside of the cab both for coupling and release. The brakes are to be of electro-pneumatic type, two 14-in. cylinders being used on the motor and one 16-in. cylinder on the trail car. The air compressor is operated from the 1,500-volt line with G.E. compressor governor.

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The truck frames for both cars are of the cast-steel type with double equalizers. The motor car trucks are to have 38-in. rolled steel wheels while the trail cars will have 33-in. wheels. The motor trucks are of a special design to provide for application of the 250-hp. motors, each truck being equipped with two, or a total of four motors per car. All the ten cars are equipped with roller bearings.

The cars are to be of multiple-unit type with the main control and operating equipment underneath the motor car. The batteries for the 32-volt system used for car lighting, door operations, signals, etc., are installed underneath the trail cars. The entire conduit system for the electric wiring is to be installed by using aluminum conduit and aluminum junction boxes. All other fittings such as condulets, unions, couplings, locknuts and bushings are also to be of aluminum, which reduces the weight of the car materially.

Classification of Iron and Steel Scrap

Simplified Process Recommendations R58-28, namely, the first revision of the classification of iron and steel scrap has been issued by the Department of Commerce, Washington, D. C. A general campaign for elimination of industrial waste has been carried on for several years by the Division of Simplified Practices of the Department of Commerce. Early in 1926, the metals industries organized a national committee on metal utilization to co-operate with the Division of Simplified Practice in all waste elimination projects affecting this class of products.

For three years the scrap industry analyzed and studied the question of the classification of this commodity. Conferences were held at which producers, distributors, and consumers were present, so that the specification, when finally drafted, would meet the needs of all phases of the industry. Finally, in 1926, the committee which had drawn up the specifications, requested the Department of Commerce to call a general conference of all interests to consider the adoption of the proposed classification.

At this conference, the proposed specifications were discussed in detail and some minor changes made. They were then adopted for a period of one year, at the end of which time a revision conference was to discuss and, if found desirable, modify the classification. Contract form of purchase of scrap was adopted at the same time. Suggestions and questions that the industry wishes to submit are to be referred to the committee on iron and steel of the National Association of Purchasing Agents, which committee drew up the recommendations.

The standing committee held its annual reunion meeting in Chicago, Ill., on Jan. 18, 1927. This was a joint session with the representatives of the American Railway Association and the Waste Material Dealers Association. The results of the meeting practically insured uniformity as to scrap classifications. Specifications have the approval of the scrap dealers, steel makers, and the committee of the National Association of Purchasing Agents, representing the simplified practice recommendation and the classification of iron and steel scrap.

The following changes were made and have been incorporated in the present edition of this recommendation: Changes in the specifications for classes of scrap for use in the basic open-hearth furnaces, changes in specifications for classes of low phosphorus and low sulphur steel scraps for use in acid open-hearth furnaces, and changes in specifications for classes of scrap for use in gray iron foundry practice. Copies of this bulletin, including the complete simplified practice recommendation and its revision may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 10 cents each.

ELECTRIC RAILWAY MATERIAL PRICES—SEPT. 11, 1928

Metals—New York

Copper, electrolytic, cents per lb.	14.525
Lead, cents per lb.	6.4
Nickel, cents per lb., ingot	35.
Zinc, cents per lb.	6 6
Tin, Straits, cents per lb.	47.
Aluminum, 98 or 99 per cent, cents per lb.	23.90
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	53.00
General service	31.50

Bituminous Coal

Smokeless Mine Run, f.o.b. vessel, Hampton Roads, gross tons	4.225
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.8
Franklin, Ill., screenings, Chicago	1.5
Central, Ill., screenings, Chicago	1.475
Kansas screenings, Kansas City	2.175

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, 5/16 in. and larger, cents per lb.	2.80
Tie plates (flat type), cents per lb.	2.15
Angle bars, cents per lb.	2.75
Rail bolts and nuts, cents per lb.	3.90
Steel bars, cents per lb.	1.875
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.40

Hardware—Pittsburgh

Wire nails, base per keg	2.55
Sheet iron (24 gage), cents per lb.	2.7
Sheet iron, galvanized (24 gage), cents per lb.	3.5
Galvanized barbed wire, cents per lb.	3.20
Galvanized wire, ordinary, cents per lb.	3.00

Waste—New York

Waste, wool, cents per lb.	18.
Waste, cotton (100 lb. bale), cents per lb.:	
White	17.25
Colored	13.5

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	10.
White lead in oil (100 lb. keg), cents per lb.	13.75
Turpentine (bbl. lots), per gal	$0.535
Putty, 100 lb. tins, cents per lb.	5.50

Wire—New York

Copper wire, cents per lb	16.625
Rubber-covered wire, No. 14, per 1,000 ft.	5.3
Weatherproof wire base, cents per lb.	17.125

Paving Materials

Paving stone, granite, 5 in., f.o.b. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd., f.o.b.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd., delivered	3.375
Cement, Chicago consumers' net prices, without bags, f.o.b.	2.05
Gravel, ¾-in., cu.yd., delivered	3.375
Sand, cu.yd., delivered	2.125

Old Metals—New York and Chicago

Heavy copper, cents per lb.	12.375
Light copper, cents per lb.	10.875
Heavy yellow brass, cents per lb.	7.125
Zinc, old scrap, cents per lb.	3.25
Lead, cents per lb. (heavy)	4.75
Steel car axles, Chicago, net ton	$16.25
Cast iron car wheels, Chicago, gross ton	12.875
Rails (short), Chicago, gross ton	16.75
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.00

Chicago, South Shore Improvements to Be Made

The Chicago, South Shore & South Bend Railroad will undertake this month a number of important construction projects, planning to complete all work before the end of the year.

In Michigan City 130-lb. rail in 66-ft. lengths will be laid from Sheridan to Michigan Streets. In South Bend, 100-lb. rail will be installed between College Street and Cummins siding. All joints in both installations will be welded.

A second large construction job will be a new freight interchange with the Chicago, Indianapolis & Louisville Railroad, west of Michigan City. This improvement will eliminate the handling of Monon freight over the main line of the South Shore through Michigan City and thus greatly reduce the amount of freight which has heretofore been carried over the tracks on East Eleventh Street.

There will be three interchange tracks of 50-car capacity, 6,000 ft. of new track in all.

Buses for Oakland

Key System Transit Company, Oakland, Cal., has ordered $250,000 of bus equipment from Fageol Motors Company. This order is for its new Alameda-Oakland lines, which are replacing the trolley system.

TRADE NOTES

BOTFIELD REFRACTORIES COMPANY, Philadelphia, Pa., announces the appointment of W. E. Tierney as its representative in the South and Southwest with headquarters in New Orleans, La.

STEVENS & WOOD, INC., moved on Sept. 1 to larger quarters and are now occupying the twentieth floor of the new Chase National Bank Building at 20 Pine Street, New York City.

BERNARD LESTER, assistant industrial sales manager of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has been placed in charge of the company's business relationships with architects, builders, building contractors, and manufacturers of machinery and motor-driven appliances. His headquarters are at 150 Broadway, New York City.

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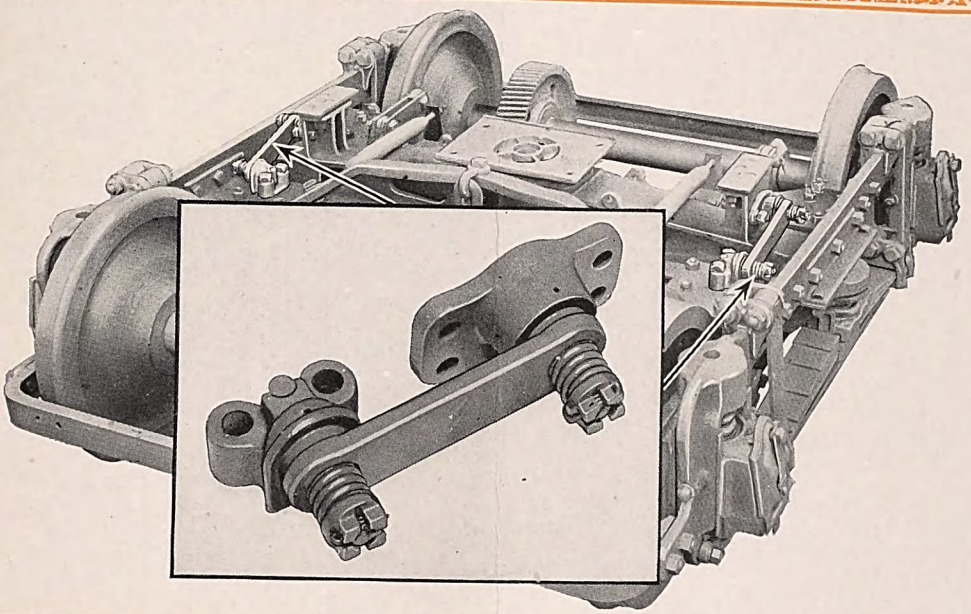

Comfort Counts!

Passengers are apparently demanding comfort at any price and readily appreciate features which contribute to comfortable riding action.

The Brill Half-ball Bolster Guide maintains the truck bolster in proper relationship to the transoms, thus eliminating shocks and destructive vibrations which would otherwise accompany their contact. Chaffing plates are not required.

The Brill Half-ball Bloster Guide assures passenger comfort in starting and stopping. While this Brill patented feature is standard equipment on the newer type trucks, it is equally advantageous and can be easily installed on all pivotal trucks for city, suburban and interurban service.

Try out the Brill Half-ball Bolster Guide to your own satisfaction. Write for a car set for test purposes.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

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TIMKEN CAR 51 TRUCK

worm drive

will be exhibited in space-400 at the A·E·R·A Convention..

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

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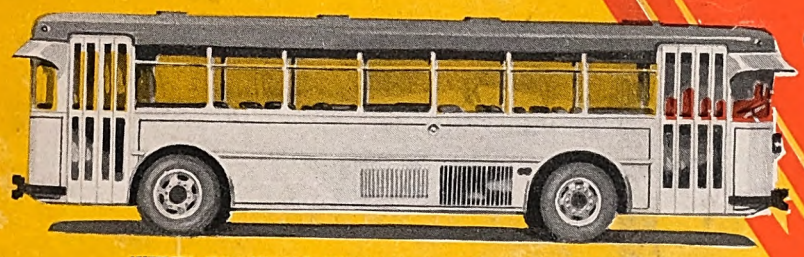
A.E.R.A. EXHIBIT ISSUE

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Publishing Company, Inc. SEPTEMBER 22, 1928 Twenty Cents Per Copy



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Transportation Equipment to fit your needs-

TRACKLESS TROLLEYS

80% *of all structural units on the three types are* **interchangeable**

AUTOMOTIVE RAIL STREET CARS

Twin Coach
BY F. R. FAGEOL KENT, OHIO

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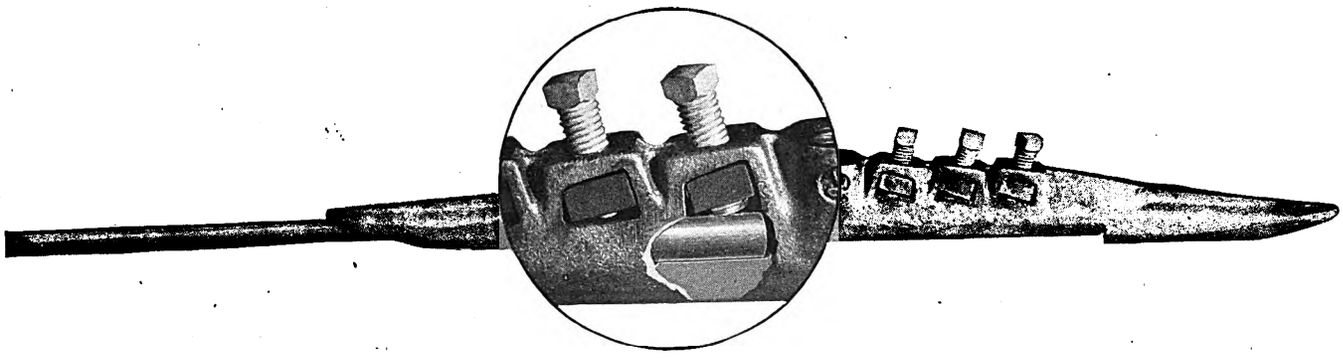

The RB Trolley Splicer

THE RB Splicer is easy to install. Wires are inserted without bending. A pair of pliers is sufficient to tighten the set screws with rocking nuts. And how those rocking nuts do hold! Increased tension on the wire just makes them hang on tighter.

Because of its tapered shape, coming to a rounded point at the bottom, the RB splicer rides on the bottom of the groove in the trolley wheel. Wear is almost entirely confined to rolling friction.

Burning also is reduced--by the smooth under-run that is almost as smooth as plain wire. The complete transition takes place on a straight line.

The RB Splicer is made for all sizes of wire from 2-0 to 4-0 round and grooved.

See the RB Splicer and a complete exhibit of Line Material in space 112—A. E. R. A. Convention, Cleveland, September 22-28.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in all Principal Cities of the United States and Foreign Countries

Keep Your Overhead Down *by* Keeping it UP *with* Westinghouse Line Material

MEMBER A.E.R.A. 1928

Westinghouse

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

CHARLES GORDON, *Editor*

LOUIS F. STOLL,
General Manager

Volume 72 New York, Saturday, September 22, 1928 *Number 12*

An Exhibit That Dramatizes an Industry's Progress

FOR the third successive year, the eyes of the local transportation world are focused on Cleveland. Once again this hospitable Ohio metropolis is the mecca for the men who are gathering for this great national transportation conference—the 47th—from every section of the country and from foreign lands as well. They come from every department and from every line of activity. A program has been prepared which promises information and inspiration for every delegate, from the highest in rank to the lowest; from the general executive to the specialized worker.

Since the early days of transportation the American Electric Railway Association convention has exerted a powerful influence in guiding the industry through its long, varied and honorable career. But during the past few years this great national conference has become even more vital than ever, as the industry courageously has battled its way through a confusing tangle of changing economic conditions. It has become a national clearing house of thought and experience through which the industry is working out those policies that gradually but surely are regaining for it public recognition as an essential community service.

JUST as the convention itself has become of increased importance to the industry, so has the exhibit come to play a part increasingly vital in this great national event. The exhibit has grown to be more than merely a commercial display of equipment. It has come to reflect the definite and material advance being made by the electric railways toward meeting new conditions and new transportation requirements.

The big idea back of the exhibit is typified by the fact that operating companies, association committees and sectional associations join in staging displays that help to interpret the forward march of technical achievement.

IT WAS in recognition of the growing importance of the exhibit that this issue of ELECTRIC RAILWAY JOURNAL was conceived. Here is collected for the first time a summary of the many new products and the improvements of standard equipment developed during the year. Here is available for the delegate at the convention an analysis and interpretation of each principal group of apparatus, to aid in his inspection of the many items in which he may be specifically interested. For those who were unable to get to Cleveland it brings the exhibit to their desks—as nearly as that is possible in type and pictures. For the returning delegate, it constitutes an invaluable record for future reference.

All of this has been made possible only through the hearty co-operation of the association and the exhibiting manufacturers. The editors of ELECTRIC RAILWAY JOURNAL take this opportunity of thanking those who have helped to carry out the idea back of this issue. In these pages there is evidence to convince even the most skeptical that the local transportation industry is alert to its responsibility and has the courage, the imagination and the energy needed to win the right to success as a public servant. In the manner in which it reflects the advances made in physical and technical equipment to meet a new day and new conditions, the A.E.R.A. exhibit dramatizes the industry's progress.

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Exhibit Again Is Big Feature

Response to demand for merchandising features evident. Comfort rather than luxury outstanding in latest designs. Imposing array of new cars and buses. Light-weight equipment a universal demand

FOR the third time in as many years a great exhibit of cars, buses and equipment has been assembled at Cleveland in connection with a convention of the American Electric Railway Association. In respect to number of devices shown and in range of products this year's show exceeds anything in the exhibits of last year and of 1926. Nothing shown at Atlantic City or elsewhere previously had come anywhere near the exhibits at Cleveland, so that without question this ranks as the greatest of all displays of its kind.

Many things have contributed to the success of this year's exhibit. The demand of transportation men for equipment and devices in keeping with modern needs has been responsible for the development by the manufacturers of new and improved products and methods. In 1926 the space requirements for handling the display of these developments were so great that it was necessary to plan the erection of a temporary building, and then to revise the plan to increase greatly the size of this building. Even then, the outdoor space was taxed to hold the display of cars and locomotives.

This year, with the completion of the Auditorium Building, it has been possible to make a larger readjustment of the floor plan, so that the space is being used to better advantage than in past years. At the time of going to press 118,764 sq.ft. of space was being used by 247 exhibitors. This includes displays of state, sectional and other associations and A.E.R.A. committees. The space actually sold is 108,160 sq.ft. in the booths and 1,167 linear feet of track space. The booth space compares with 116,634 sq.ft. last year.

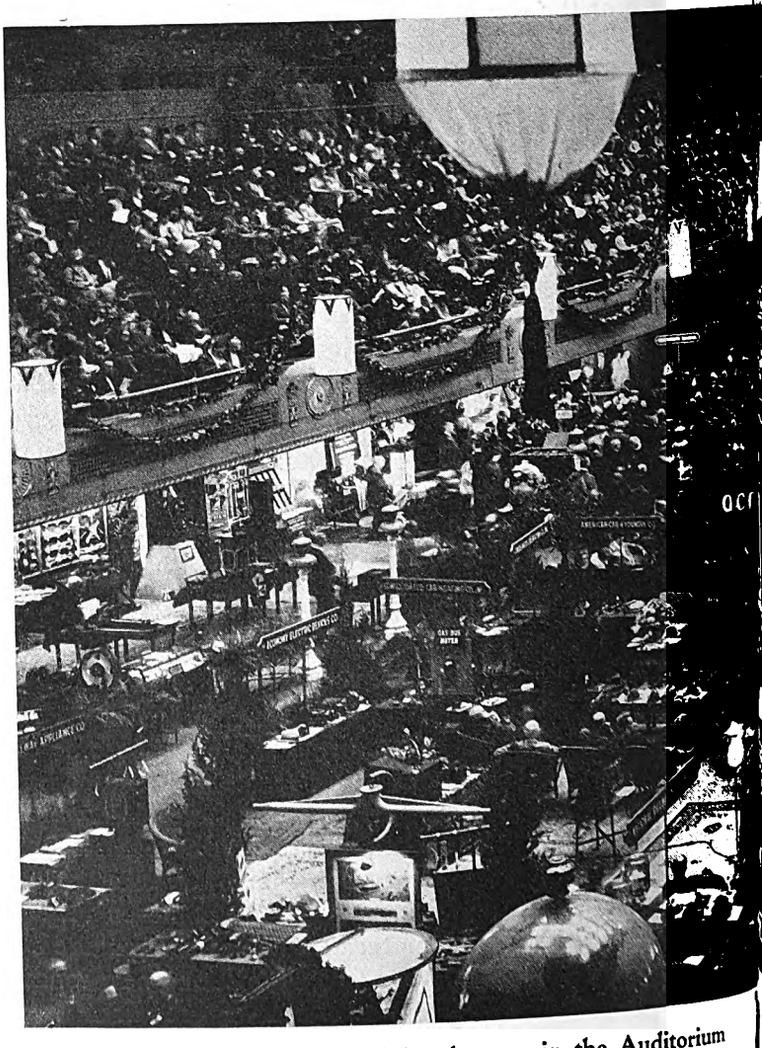
Completion of the north wing of the Auditorium has made possible a rearrangement of the entrance and registration facilities. Those who were at Cleveland will remember the confusion brought about by the use of a number of separate entrance doors along East Sixth Street, with the registration booths along a narrow corridor. This year the main entrance to the convention will be at the north end of the Auditorium. The arrangement is not, however, the same as it was two years ago, for an entrance lobby has been added.

Entering the Arena, the delegate is struck with the brilliancy of an autumn scene. Hundreds of trees have been used for decorations. Their white trunks contrast with the many-colored branches in autumn tints. Draped over the trees are festoons of smilax, giving a touch of evergreen. Even overhead there are trees in a riot of color that has completely transformed the immense hall. In the Auditorium Annex an entirely different scheme has been used to advantage. The decorations are in pastel green and white on black. While contrasting sharply, the lightness and airiness have been carried throughout the plan of decorations.

The numbering system for exhibit spaces is substantially the same as that of last year, making the location of any exhibit easy to find. All the spaces on the main Arena floor are numbered from 100 up to 141, inclusive. Those in the Exhibition Hall beneath begin with 200 and run to 299, with additional booths numbered from 200A up to and including 213A. The covered maintenance-of-way displays in the Esplanade connecting the Auditorium with the Auditorium Annex carry space numbers from 300 to 338. The numbers for the Auditorium Annex are all 400 and above. Those in the north half of the building, at the right of the entrance from the Esplanade, run from 400 to 523 inclusive, while those in the south half, at the left of the entrance, carry numbers from 600 to 685 inclusive.

The general layout of the exhibit follows the plan which has been so successful in the previous shows held in the Auditorium. The Arena floor contains the dis-

Millions of Dollars Worth



Additional space in the Auditorium

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of the Cleveland Convention

plays of the large electrical manufacturers, indoor booths of the car builders and car accessory manufacturers and a number of exhibits of general interest.

On the floor below, in Exhibition Hall, are indoor exhibits of trackwork manufacturers and many car specialties. The range of products covers many of the details that go to make up the supply business.

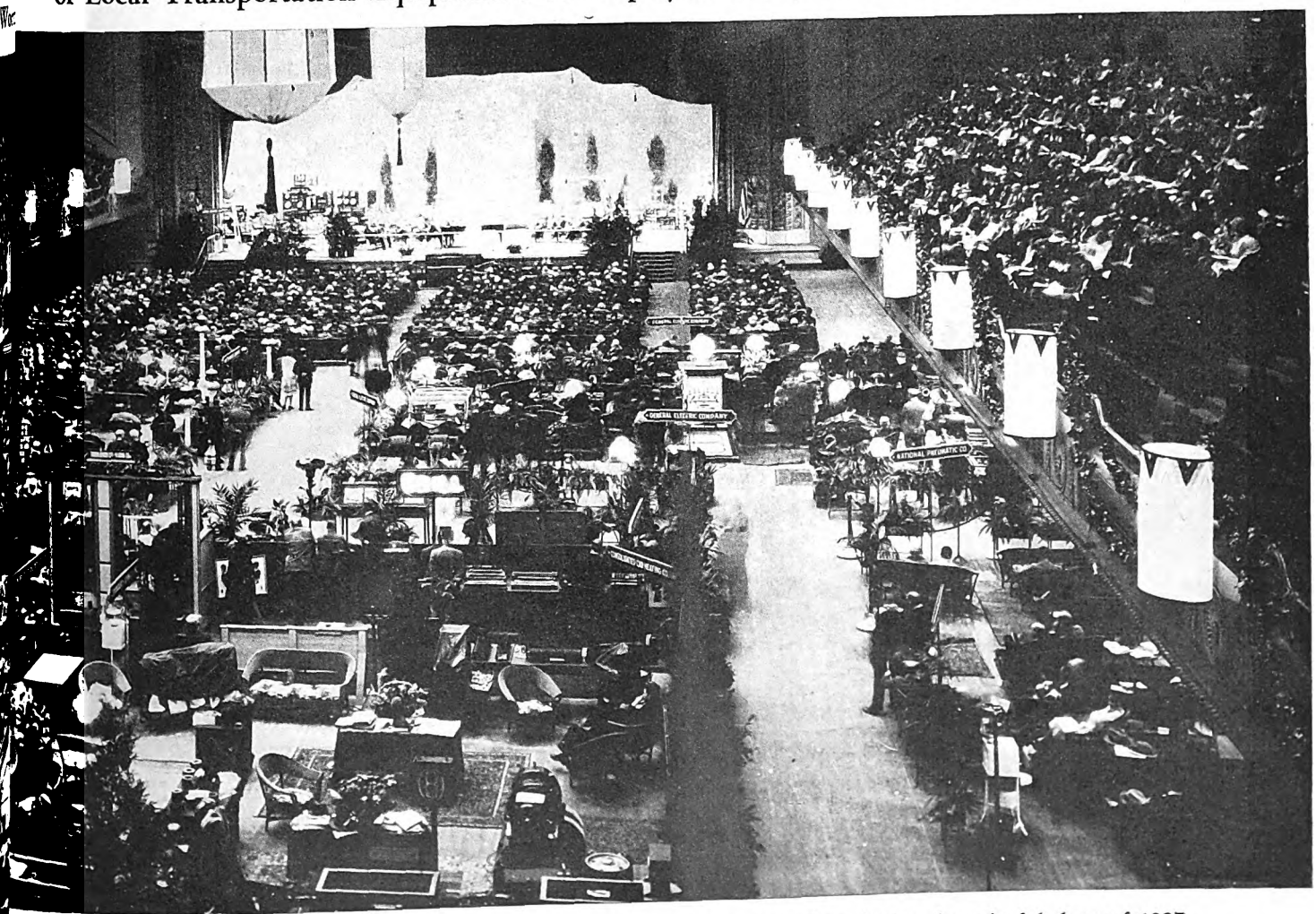
Between the Auditorium and the Annex the Esplanade is taken up principally with working exhibits of maintenance-of-way machinery. In past years these have drawn large crowds of persons who have desired to become more familiar with the actual operation of many of the devices displayed.

To the south of the Esplanade is the open track space. Here are the latest types of city and interurban cars. A great deal of interest attaches to these. Radical innovations have been made by nearly all of the builders, and much time can be spent profitably in an inspection of the developments, the reasons which have prompted them, and the several methods employed for accomplishing such things as weight reduction, greater comfort, better acceleration and improved attractiveness. In this section there also is a complete display of trolley poles and overhead line equipment, erected in actual working order.

As in past exhibits, the Auditorium Annex is devoted largely to the display of buses and bus equipment. Complete buses occupy the center of the hall, immediately in front and to the right of the entrance from the Esplanade. At the north end of the Annex is a display of automotive tools and shop equipment, featuring many recently-developed machines for facilitating the heavy duty of bus repair work. Trucks and chassis are in the center, to the left of the main doorway. At the south end of the building is a display of street car and automotive accessories, covering a wide range of products, including fare collecting and accounting devices, door and window fittings, bearings, trolley fittings, headlights, heaters, glass, seat materials, flooring, and many others.

Completion of the north wing of the Public Auditorium has made available a number of excellent meeting rooms, permitting a rearrangement to much better

of Local Transportation Equipment Are Displayed at A.E.R.A. Gathering



promises even more effective arrangement of the exhibit and meeting rooms than during the colorful show of 1927

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Much interest attaches to the exhibit of cars and locomotives in the outdoor track space. Even more radical developments than those pictured here are being shown this year

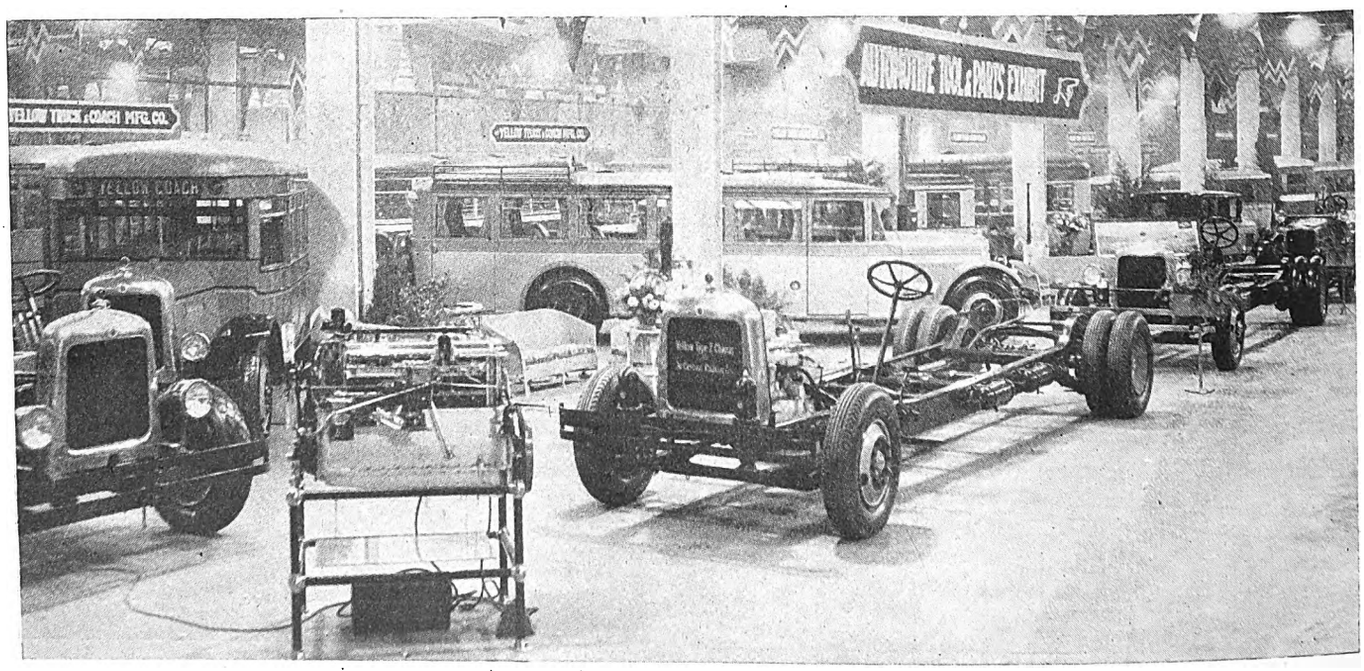
advantage than in the past two years. The American Association meetings will be held in the ballroom on the third floor of the north wing. It is reached most conveniently by the elevators to be found in the lobby at the right of the main entrance. The Accountants' Association meetings will be held in Room A on the same floor and reached by the stairway at the right side of the lobby at the main entrance. Meetings of the Claims Association will be in Room C, on the second floor of the north wing. It is reached by the elevators in the lobby at the right of the main entrance.

The Power Division of the Engineering Association will be held in Room P on the second floor, also reached by the same elevators. The meeting of the Purchases and Stores Division of the Engineering Association on Monday will be in Room S on the mezzanine floor, which is reached by the ramp at the right of the entrance. Wednesday's session of this division will be held along with the Accountants' in Room A. The Rolling Stock Division will hold its meetings in Room R in the lower Exhibition Hall, reached by the stairway at the entrance. The Way and Structures Division will meet in Room W, also in the Exhibition Hall, reached by the stairway. The general meeting of the engineers on Thursday will be held in this same room.

Meetings of the Transportation and Traffic Association will be in Room T, on the second floor, reached by the elevators at the right of the main entrance.

Those attending the Education Committee Training Courses should go to Rooms 257 and 258 on the mezzanine, reached by the ramp.

It would be impossible to give in this article a description of the many innovations on display. In fact, the several articles which make up this issue do little more than give a brief outline of the new products which have been brought out since the last convention.



Not only buses, but bus equipment, parts and general maintenance machinery shown in the Auditorium Annex present many advances over those which attracted wide interest at Cleveland last year

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Exhibitors at the 1928 Convention

Directory of all manufacturers at the A. E. R. A. exhibit with company addresses, spaces being occupied, complete lists of products on display and representatives in attendance

ADAMS & WESTLAKE COMPANY, Elkhart, Ind. **Space 604.** Electric car lighting fixtures, brass window sash and curtains for electric cars and buses, automobile and bus lamps, bus lighting equipment. Represented by A. S. Anderson, G. B. Allison, C. E. Banta, Ralph Brown, T. Heaton, T. P. O'Brian, W. G. Porter, R. D. Whitlock, E. E. Whitmore.

AHLBERG BEARING COMPANY, 317 East 29th Street, Chicago, Ill. **Spaces 605, 606.** CJB master ball bearings, Ahlberg ground bearings. Represented by C. J. Bender, P. P. Bender, J. E. Lewis, F. O. Burkholder, R. M. Place, F. J. McNicoll, M. H. Palmer, B. B. Clark, A. S. Benge, R. D. Jones, E. T. Richards.

ALUMINUM COMPANY OF AMERICA, 2400 Oliver Building, Pittsburgh, Pa. **Space 141.** Represented by J. O. Chesley, R. E. Palmer, E. L. Chipman, A. B. Wilber, C. J. Laing, R. P. Hotchkiss, A. H. Woollen, Paul Thornton, S. A. Hartwell, Jr., R. M. Beck, Dain W. Milliman.

AMERICAN BRAKE MATERIALS CORPORATION, 4660 Merritt Avenue, Detroit, Mich. **Space 277.** Latest developments of both thick and thin type Brakebloks for heavy automotive vehicles, automobile passenger cars and industrial machinery. Represented by T. F. Finigan, H. N. Smith, E. Kisby, W. A. Blume, H. D. Harrison, W. F. Seifert, H. A. Gillies, E. C. Clark, F. P. Biggs, W. K. Nelson.

AMERICAN BRAKE SHOE & FOUNDRY COMPANY, 30 Church Street, New York, N. Y. **Space 249.** A.E.R.A. standard patterns of brake shoes, brake heads and keys; Diamond S steel back type shoes; malleable iron brake heads and shoe keys; reception booth.

AMERICAN BRASS COMPANY, 414 Meadow Street, Waterbury, Conn., and the

ANACONDA COPPER MINING COMPANY, 25 Broadway, N. Y. **Space 211A.** Anaconda trolley wire, Hitenso and copper; copper and composite cables for catenary construction; Anaconda seamless connectors for splicing wire and cables; preformed cable; lead sheathed cable; Anaconda hollow conductors; bare and weatherproof copper line wire; Everdur (manganese silicon bronze); seamless and brazed tubing for auto and bus windshields and window casings; nickel, silver and bronze running board moldings. Represented by W. H. Dowd, T. J. Little, H. D. Hawks, C. S. Anderson, W. C. Knoeppel, C. H. Porter, H. G. Burd, F. R. Drake, T. R. Foote.

AMERICAN CAR AND FOUNDRY COMPANY, 30 Church Street, New York, N. Y. **Space, half of 120.** Reception booth. Represented by J. H. Welsbrod, R. J. Smith, A. E. Ostrander, F. H. Gibbs, E. P. Chittenden, J. L. Onderdonk, Thos. Geddes, T. E. Lyons, J. M. Keller, C. P. Dickerman.

AMERICAN CAR AND FOUNDRY MOTORS COMPANY, 30 Church Street, New York, N. Y. **Spaces 618-623.** Complete line of A.C.F. coaches, including 40-passenger metropolitan coach, 29-passenger parlor observation coach, 27-passenger parlor coach, 29-passenger de luxe urban coach, 21-passenger parlor coach, 23-passenger urban coach; two stripped chassis; a Hall-Scott engine display; a cutaway 40-passenger metropolitan coach, showing in detail the structural framing and manner of mounting the power plant and auxiliaries. Represented by C. S. Sale, W. L. Stancliffe, H. Hager, C. C. Castle, W. J. Overman, Henry Ganz, E. M. Hedley, F. S. Beasecker, K. C. Banks, E. W. Bogan, W. E. Cann, H. C. de Raismes, F. H. Foglesong, J. N. Goold, B. L. Graves, R. S. Hayes, L. H. Hyneman, Frank Jay, L. V. Joyce, F. L. Martin, W. L. McCormick, Chas. W. Morey, H. G. Nichols, Jay T. Putney, W. E. Reed, C. W. Wood, P. W. Wood, L. E. Vogt, J. W. Robb, J. J. McMahon, L. E. Hess, J. H. Stickney, F. A. Whitten, Fred E. Dayes, Theo. Renton, Burt Van Gorp, John Watters, Fred Koenig.

AMERICAN ELECTRIC RAILWAY ASSOCIATION COMMITTEES. See page 498.

AMERICAN FORK & HOE COMPANY, 1623 Euclid Avenue, Cleveland, Ohio. **Space 335.** True temper tapered rail joint shims, Stead True Temper rail anchors. Represented by S. L. Henderson, A. F. Fifield, J. T. Reagan, C. H. Wagner, G. B. Durell, W. Withington, A. W. Ferguson, S. S. Chapin.

AMERICAN STEEL & WIRE COMPANY, 208 South LaSalle Street, Chicago, Ill. **Space 206.** Complete line of rail bonds, electrical wires and cables, wire rope, etc. Represented by C. S. Knight, R. E. Francisco, John May, Herman Barthell, H. H. Febrey, A. T. Merriman, Clarence Gilchrist, R. C. Pierce, C. F. Wiley, W. H. Cordes.

ANDERSON BODY COMPANY, Sidney, Ohio. **Spaces 505-507.**

ANDERSON BRAKE ADJUSTER COMPANY, 22nd and Belt Line, Omaha, Neb. **Space 232.** Working exhibit of latest type Anderson non-vibrating slack adjuster, particularly suited for beamless brake rigging; specimens of other types. Represented by C. O. Anderson.

ARCO COMPANY, 6408 Euclid Avenue, Cleveland, Ohio. **Spaces 498, 499.** Display showing in detail all steps in the process of coach body finishing in the Arcozon Pyroxylin system, producing a gloss finish without polishing. Represented by Richard R. Paradies, Geo. B. Sawyer, H. J. Hoffman, S. D. Moore.

ART RATTAN WORKS, INC., Cleveland, Ohio, and Oakland, Cal. **Space 404.** Latest designs in bus seats, including wicker and fully-upholstered parlor car and urban seats; new type reclining back seat. Represented by Charles E. Ferreira, Carl F. Krumhar, George G. Barney.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS, 1847 McCormick Building, Chicago, Ill. **Space 210A.** Chilled tread street car wheels, rim and apex of the flange of which have been covered with chiller. Represented by G. E. Doke, S. C. Massari.

B

BALDWIN LOCOMOTIVE WORKS, Paschall Station, Philadelphia, Pa. **Space 208A.** Truck of the equalized pedestal type for use under heavy, high-speed, interurban passenger cars. Represented by A. H. Ehle, R. M. Campbell, Chas. E. Hale, Lewis W. Metzger, Jr., W. H. Evans, H. J. Snowden, G. J. F. Carpenter.

BENDER BODY COMPANY, 6201 Barberton Avenue, Cleveland, Ohio. **Spaces 600-603.** Bus bodies.

BENDIX BRAKE COMPANY, South Bend, Ind. **Space 407.** Bendix 4 brakes. Represented by D. K. Moore, R. S. Sanford, A. C. Chambers, H. L. Sharlock.

BETHLEHEM STEEL COMPANY, Bethlehem, Pa. **Spaces 283-289.** Special trackwork; pressed steel flangeway guard for roadway crossings; Bethlehem-Keystone metal tie; rolled steel car wheels, axles, armature shafts, gear blanks and brake drums; commercial and industrial applications of Bethlehem torque amplifier; rolled steel truck wheels; items of structural tool and alloy steels and bolt and nut products for the electric railway field. Represented by N. E. Salsich, J. H. Budd, W. E. Loomis, J. L. Toler, G. H. Riddle, J. W. Murphy, R. R. Deghuee, J. V. Honeycutt, R. Knibloe, C. L. Mosses, A. K. Boot, J. H. Smiley, C. W. Nieman, J. P. Madden, A. W. Stoever, E. B. C. Goyne, H. W. Prindle, J. C. Chandler, W. B. Pritchard, C. A. Alden, R. L. Gillispie, M. Vickers, J. L. Tygart, F. M. Hoffman, T. E. Hooper, C. E. Fry.

BINKS SPRAY EQUIPMENT COMPANY, 3124 Carroll Avenue, Chicago, Ill. **Spaces 425, 427.** Complete line of spray finishing and ventilating equipment; everything for refinishing street cars and motor buses, including the new improved spray gun and enclosed type window fans, air motor agitated pressure material containers, etc. Represented by V. G. Green, R. L. Fisher.

BLANCHARD BRO. & LANE, 20 Bruen Street, Newark, N. J. **Space 650.** Genuine leather for the upholstering of buses and automobiles. Represented by William H. Ressland, Curtis S. Withrow, William M. Lalor, Chas. C. Gunterberg, Ryan Sales Engineering Company representatives.

ROBERT BOSCH MAGNETO COMPANY, INC., 3601 Queens Boulevard, Long Island City, N. Y. **Space 617.** Bosch Super-Energy magnetos, Pyro-Action spark plugs, voltage regulated generators, horns, windshield wipers, spotlights and other automotive electrical equipment suited for bus use; a new generator; Bosch type FD horn, offered for the first time for bus service. Represented by A. F. Wagner.

BRAGG - KLIESRATH CORPORATION, Queens Boulevard & Harold Avenue, Long Island City, N. Y. **Space 406.** Brake boosters, slack adjusters.

J. G. BRILL COMPANY, 62nd and Woodland Avenue, Philadelphia, Pa. **Space, half of 120 and track D.** New car for the Delaware Electric Power Company, Wilmington, Del., and new interurban for Monongahela-West Penn Public Service, Fairmont, West Va., on track D; indoor exhibit, latest type Brill seats for electric railway and motorbus service; demonstration of the improved type Brill mechanical slack adjuster; display of recent truck improvements for reducing maintenance, including journal box wear plates, wear caps and bushings for halfball brake hangers and systematic lubrication of brake hangers and bottom brake rods. J. G. Brill Company represented by Samuel M. Curwen, George M. Haskell, George Frey, J. E. Brill, S. T. Bole, George Keller, W. S. Adams, J. A. Hanna, E. Slingluff, Jr., J. A. Brooks, A. J. Briddes, E. T. Deal, A. M. Robinson, W. L. Brown, W. M. Horsell; G. C. Kuhlman Car Company represented by H. K. Hauck, H. G. Arthur, L. G. Sircoulomb, C. N. Pittinger, E. Slingluff, R. H. Watts, C. F. Dennis, T. B. Richardson, H. Hummel; American Car Company represented by F. A. Richards, F. L. Markham, R. S. Hood, Jr., Wirt L. Haymond, W. J. Mackle, B. Schechter; Wason Manufacturing Company represented by C. F. Johnson, R. T. Foster.

BROWN-LIPE GEAR COMPANY, 1117 West Fayette Street, Syracuse, N. Y. **Space 437.** Transmissions, clutches, controls, power take off assemblies.

BUDA COMPANY, Harvey, Ill. **Space 209A.** Photographs and models of special trackwork, track liners and spring boxes. Represented by R. B. Fisher, H. L. Miller, F. W. Marvel, C. T. Miller, H. Brown, P. W. Wood.

BUDD WHEEL COMPANY, 12141 East Charlevoix Avenue, Detroit, Mich. **Space 480.** Budd dual wheel, showing mounting of a 20-in. and 24-in. diameter wheel on same hub; one dual assembly of 9.75 balloon tires on 22-in. rim, showing standard double cap nut method of mounting. Represented by E. A. Clark, E. S. Ingham, C. L. Wenzel, J. H. Barnes.

"BUS AGE," 461 Eighth Avenue, New York, N. Y. **Space 520.** Copies of *Bus Age* and literature. Represented by J. M. Wile, George M. Sangster.

"BUS TRANSPORTATION" Tenth Avenue at 36th Street, New York, N. Y. **Space 102.** Copies of *Bus Transportation* and other McGraw-Hill publications. Represented by James H. McGraw, Louis F. Stoll, C. W. Stocks, R. E. Plimpton, E. F. Theisinger, R. F. Deitz, Frank Dannhauser, T. F. Mueller, Warren Drew, O. A. Feldon, Frederic Rueckert, D. G. Heinly, W. K. Beard, F. A. Miller.

C

CANADIAN CLEVELAND FARE BOX COMPANY, LTD., Preston, Ontario, Canada. **Space 665.** Double-locked fare boxes, zone check boxes, change carriers. Represented by M. C. McElligott, W. Shaw.

PHILIP CAREY COMPANY, Lockland, Cincinnati, Ohio. **Spaces 258, 260.** Rail filler, rail cushion, track pavement, flooring, third rail covering, cable trunking, foot blocking and expansion joint, all of Elastite. Represented by C. V. R. Fullenwider, O. E. Keller, C. L. Addleman, R. J. Scott, W. M. Carlson, C. F. Kayser.

C. G. SPRING AND BUMPER COMPANY, 2660 East Grand Boulevard, Detroit, Mich. **Spaces 513, 514.** Heavy duty spring type bumpers for trucks, buses, taxicabs and street cars. Represented by Fred A. Cornell, B M. Short, F. H. Goodrich, H. P. Moss, N. Y. Kristensen, C. R. Griffiths.

L. C. CHASE & COMPANY, 89 Franklin Street, Boston, Mass. **Space 405.** Chase Velmo, mohair velvet and Chase Leatherwove, imitation leather, showing the latest developments in pat-

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Exhibitors at the 1928 Convention

terns and colors. Represented by E. R. Campbell, C. J. Dyer, J. L. Gibson, McArthur Noyes.

CHASE APPLIANCE CORPORATION, 11 West 42nd Street, New York, N. Y. **Space, half of 281.** Silencers for railway tracks, insulated railway rails, noiseless rail fastenings, rail anchor tie plates for railway track. Represented by Warren Osborn.

CHEATHAM ELECTRIC SWITCHING DEVICE COMPANY, 4779 Louisville Avenue, Louisville, Ky. **Space 263.** Actual demonstration of switch point being thrown electrically by the latest type Cheatham switch; improved and shorter type ground box, patented spring holding mechanism, improved circuit changer with or without locking attachment to prevent splitting of switch points; improved light weight contactor. Represented by E. S. Olmsted, Everett C. Brown, S. S. Stolp, R. E. Tafel, R. S. Bowen, John H. Miller, J. D. Augustus.

CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD, 72 West Adams Street, Chicago, Ill. **Space 421.** Complete model of section of the North Shore line and poster displays.

CHILLINGWORTH MANUFACTURING COMPANY, Jersey City, N. J. **Space 616.** Representative types of motor gear cases of the one-piece construction. Represented by G. K. Wanamaker, J. W. Gerke.

CHILTON CLASS JOURNAL COMPANY, 56th and Chestnut Streets, Philadelphia, Pa. **Space 502.** Magazines. Represented by A. W. Brownell, E. E. Elder, George W. Pfeil, Albert G. Metz, Pete Keenan, David Beecroft.

CHRISTENSEN AIR BRAKE COMPANY, 6511 - 15 Cedar Avenue, Cleveland, Ohio. **Space 423.** Bus, truck and trailer air brakes; vacuum air brakes. Represented by Niels A. Christensen, David P. Sawyer, Chas. F. Smith, John J. Brings, A. N. Abelson.

CINCINNATI CAR COMPANY, Cincinnati, Ohio. **Track Space.** One of ten interurban cars for the Indianapolis & Southeastern Railway, one of hundred city cars for the Cincinnati Street Railway.

CLARK EQUIPMENT COMPANY, Buchanan, Mich. **Space 607.** Bus and truck axles, wheels.

CLEVELAND FARE BOX COMPANY, 4900 Lexington Avenue, Cleveland, Ohio. **Space 664.** Double-locked fare boxes, zone check boxes, change carriers. Represented by W. T. Cook, W. Shaw, V. G. Cook, M. C. McElligott.

CLEVELAND FROG & CROSSING COMPANY, 6917 Bessemer Avenue, S. E., Cleveland, Ohio. **Space 278.** Special trackwork. Represented by G. C. Lucas, L. G. Parker, G. A. Peabody, J. A. Donahey, H. I. Prentice.

CLEVELAND PNEUMATIC TOOL COMPANY, 3734 E. 78th Street, Cleveland, Ohio. **Space 452.** Gruss and Westinghouse shock absorbers. Represented by P. J. Hipes, B. H. Prauty, Jr., Ovid Holtan, J. W. Broughton, E. Kreuger, S. Swift, Earl Schultz, F. H. Burr, D. R. Taylor, H. A. Lantz.

CLEVELAND RAILWAY, Cleveland, Ohio. **Track Space.** Articulated unit.

CLEVELAND SOUTHWESTERN RAILWAY & LIGHT COMPANY, 1670 Union Trust Building, Cleveland, Ohio. **Track J.** Interurban car with latest designed seating and seating arrangement. Represented by F. Hurlson, J. W. Osborne, E. L. Hukiee, C. J. Moyers, J. A. Nester.

CLEVELAND TANNING COMPANY, Denison Avenue and Jennings Road, Cleveland, Ohio. **Space 496.** Upholstering leathers for all mediums of transportation. Represented by F. R. Wilhelmy, W. G. Plumer, Albert Hoinke, A. H. Sisson, S. W. Midgley, R. W. Preikschat.

BARRON G. COLLIER, INC., 220 West 42nd Street, New York, N. Y. **Space 104.** Reception booth. Represented by Barron Collier, Edwin C. Faber, T. H. Lumsden, B. V. Swenson.

COLLIER CONSTRUCTION COMPANY, 500 East 102nd Street, Cleveland, Ohio. **Space 311.** Map of distribution system and car lines of Cincinnati Street Railway, with miniature lamps and toy train to show difference in voltage and power conditions effected by installation of 19 new automatic substations. Represented by P. C. Collier, Frank Simpson, W. D. Smoot, M. B. Stahl.

CONSOLIDATED CAR-HEATING COMPANY, INC., 413 North Pearl Street, Albany, N. Y. **Spaces 118, 119.** Motor resistor heaters, buzzers, treadle operated doors, control switches, bells, pneumatic door engines, safety switches, automatic ventilators, relays, fuse boxes, thermostats, resistor boxes, electric car heaters, signals. Represented by Cornell S. Hawley, John W. Conway, William S. Hammond, Jay A. Robinson, George E. Oakley, Harry L. Hawley, Robert J. Parsons, Curtis N. Brown.

CONTINENTAL MOTORS CORPORATION, Detroit, Mich. **Space 497.** Latest engine designs, developed for bus, truck and industrial uses; sectional bus engine, operating to show all moving parts. Represented by O. R. Baird, C. P. Russell, Harry Kline, F. T. Gould, D. A. Andrews, W. A. Frederick, G. W. Blackinton.

COWDREY BRAKE TESTER ORGANIZATION, INC., Fitchburg, Mass. **Space, half of 663.** No. 11A Cowdrey dynamic brake tester. Represented by C. Francis Cowdrey, Jr. Also members of the National Railway Appliance Co., of New York and Hegeman-Castle Corporation of Chicago.

CREW LEVICK COMPANY, 60 Wall Street, New York, N. Y. **Space 492.**

CURTIN - HOWE CORPORATION, 11 Park Place, New York, N. Y. **Space 225.** Sections of poles, ties, car lumber, etc., preserved with ZMA; sections of car panels treated with ZMA and painted; photographs of treating plants using ZMA and ZMA treated timber. Represented by E. H. Walker, W. G. Ritt.

D

DAYTON MECHANICAL TIE COMPANY, Dayton, Ohio. **Spaces 257, 259.** Reception booth.

DAYTON STEEL FOUNDRY COMPANY, Miami Chapel Road and B & O Railroad, Dayton, Ohio. **Space 430.** Dayton steel truck wheels. Represented by George Walther, C. F. Baker, G. A. Baker, R. D. Rothaar, A. R. Lambert.

DE LUXE PRODUCTS CORPORATION, LaPorte, Ind. **Space 454.** New improved de luxe light weight cast iron piston. Represented by L. B. Boyd, H. A. Lightner, W. J. Pollay, C. N. Bentley, E. E. Crowe.

DE VILBISS COMPANY, Toledo, Ohio. **Space 500.** Spray-finishing and spray-painting equipment for steel cars, buses, bridges and buildings; compressing outfits, both motor and gasoline engine driven, pressure feed paint tanks, air and fluid hose, spray guns, other accessories; miniature working model of car exhausting equipments installed for the Cincinnati Street Railway and Cincinnati Car Company. Represented by E. G. Whitmore, members of sales organization.

DE WALTS PRODUCTS CORPORATION, Leola, Pa. **Space 512.**

DIFFERENTIAL STEEL CAR COMPANY, Findlay, Ohio. **Exhibit on track.** Differential electric dump car, electric locomotive crane car and three-way dump body; Clark concrete breaker. Represented by H. Fort Flowers, Harry T. Thompson, Shelly G. Hughes, Ralph E. Stuntz, Emerson M. Blackford.

C. L. DOWNEY COMPANY, 941-947 Clark Street, Cincinnati, Ohio. **Space 666.** Model B-42 mechanical coin teller, S-53 mechanical coin teller, S-RM coin wrapping machine, S-RH coin wrapping machine, show case with counting room supplies. Represented by C. Lee Downey, Ralph K. Long, Lawrence F. Bateman, W. Shaw.

E

EAGLE - OTTAWA LEATHER COMPANY, Grand Haven, Mich. **Space, half of 501.** Leather for de luxe buses.

C. I. EARLL, 142 Susquehanna Avenue, York, Pa. **Space 615.** Trolley catchers and trolley retrievers in operation. Represented by C. I. Earll, H. E. Uhler.

EATON AXLE AND SPRING COMPANY, East 65th and Central Avenue, Cleveland, Ohio. **Spaces 630, 632.** Truck and bus axles.

EBERHARD MANUFACTURING COMPANY, 2734 Tennyson Road, Cleveland, Ohio. **Space 627.** Door controls, folding and rigid seat pedestals, screen holders, emergency door locks, door hinges, folding steps, general line of body braces and corner irons. Represented by Arthur L. Wheeler, Carl R. Hennicke, William Bauer, Charles A. Hennicke, George Thobaben.

ECLIPSE RAILWAY SUPPLY COMPANY, 4824 Payne Avenue, Cleveland, Ohio. **Space 248.** Car fenders, standard lifeguards, H. B. type, trolley retrievers for heavy pole tension, Eclipse No. 10 trolley retriever for sliding shoe service with light pole tension, trolley catchers. Represented by Ross Forward, Paul N. Van Epp.

ECONOMY ELECTRIC DEVICES COMPANY, 37 West Van Buren Street, Chicago, Ill. **Space, part of 116.** Gasoline meters, watt-hour meters, car heaters, car materials.

O. M. EDWARDS COMPANY, INC., Corner Plum and Solar Streets, Syracuse, N. Y. **Space 671.** Metal sash, window fixtures, weatherstripping, sash balances, metal stop casings, anti-rattling devices, vestibule trap doors. Represented by Harold Edwards, J. J. Edwards, H. A. Cronmiller, E. F. Chaffee, F. W. Chaffee, C. H. Rockwell.

ELECTRIC RAILWAY IMPROVEMENT COMPANY, 2070 E. 61st Place, Cleveland, Ohio. **Spaces 330, 331.** Steel arc weld rail bonds, gas weld bonds, copper arc weld bonds and brazed bonds, rheostats for arc weld bonding or brazing with necessary auxiliary welding equipment and brazing furnaces. Represented by F. H. Neff, P. T. Bevers, N. G. Carlson, W. E. Huber, L. J. Rinker, E. B. Moore.

"ELECTRIC RAILWAY JOURNAL," Tenth Avenue at 36th Street, New York, N. Y. **Space 101.** Copies of *Electric Railway Journal* and other McGraw-Hill publications. Represented by James H. McGraw, Louis F. Stoll, Charles Gordon, Morris Buck, John A. Miller, Jr., Clarence W. Squier, George J. MacMurray, J. W. McCloy, Clifford A. Faust, L. H. Church, Victor A. Hanson, Frank Dannhauser, T. F. Mueller, Warren Drew, O. A. Feldon, Frederic Rueckert, D. G. Heinly, W. K. Beard, F. A. Miller.

ELECTRIC SERVICE SUPPLIES COMPANY, 17th and Cambria Streets, Philadelphia, Pa. **Spaces 271 - 276.** Rail bonds, trolley guards, Shelby poles, trolley wheels, compensating series lamp fixtures, Keystone trolley catchers, Golden Glow headlights, International fare registers, vehicle light reflectors, motorman gongs, bus combination rear and stop light, Faraday passenger signal systems, Safety car lighting fixtures, Ivanhoe bus lighting fixtures, emergency car lighting system, rear lights, Keystone and Hunter illuminated destination signs, car and bus mats, steel gear cases, air valves, Samson trolley cord, change carriers, Garton - Daniels d.c. lightning arresters, rear view mirrors for buses, Golden Glow bus headlights, enameled badges, automatic door signal systems, Golden Glow floodlighting projectors. Represented by Chas. J. Mayer, A. H. Englund, H. G. Lewis, Hugh Millar, Chas. W. Weber, J. L. Brown, W. A. Armstrong, F. Coakley, R. Krienberg, I. W. Schmidt, Gale car bus on 75 chassis, 75 heavy duty bus chassis, "Seminole" 22-passenger parlor observation Hunter, H. A. Stone, L. S. Belding, Geo. E. Ackerman, M. S. Earl, J. H. Mahler.

"ELECTRIC TRACTION," 431 S. Dearborn Street, Chicago, Ill. **Space 103.** Reception booth; copies of *Electric Traction* and *Traction Shop and Roadway,* including convention souvenir issues; copies of Electric Traction Pocket List; silver speed trophy, to be awarded to the fastest interurban. Represented by K. J. Kenfield, Claude L. Van Auken, R. S. Torgerson, F. E. Owens, James E. Lytle, E. E. Bodin, A. F. Smith, M. L. Lyles.

ELLCON COMPANY, 50 Church Street, New York, N. Y. **Space 678.** White porcelain enameled stanchions and hand rails with especially designed metal fittings; diamond ball bearing door hangers; porcelain enameled steel pipe, tubing and sheet in various colors. Represented by W. M. Wampler, G. H. Ord, C. A. Koenig.

EVERHOT MANUFACTURING COMPANY, Maywood, Ill. **Space 265.** Electric, gas and air, and gasoline branding irons; blow torches and soldering irons; Ray-O-Lite combination sign. Represented by A. C. Flothow, John H. Payton, C. I. Upton.

F

FEDERAL-MOGUL CORPORATION, 11031 Shoemaker, Detroit, Mich. **Space 519.** Bronze back babbitt lined connecting rod and main and crankshaft bearings, both standard size and undersize; bronze bushings, such as piston pin bushings, etc.; babbitt metals for shop maintenance and for connecting rod work; bronze cored and solid bar stock; line boring tool for crankshaft and camshaft bearing work. Represented by David W. Rodger, Frank Kellison, John F. O'Doherty, Harry A. Shoemaker.

FERALITE CORPORATION, 220 Westfield Avenue, West, Roselle Park, N. J. **Space 629.** Rail welding portions, complete with all accessories such as sand

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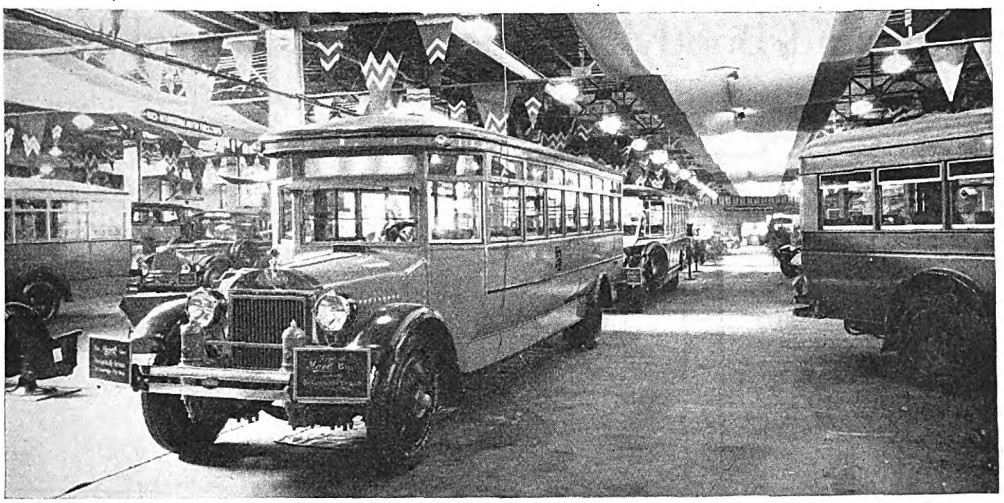

Bus body and chassis manufacturers are showing several new models in addition to many exhibited in 1927

cores, thimbles, mold boxes, patterns, butt welding clamps, crucibles, etc.; rail welding preheater with rubber tires to operate off 550 d.c. line. Represented by James F. O'Hanlon, Henry J. Barnes, Robert R. Applegate.

FERODO AND ASBESTOS, INC., New Brunswick, N. J. **Space 494.** Bonded asbestos brake lining, used with automotive type brakes on street cars. Represented by John H. Watrous, Lester T. McAuliffe, James J. Reynolds, Edward J. Pope.

FITZJOHN MANUFACTURING COMPANY, Muskegon, Mich. **Spaces 402, 403.** Observation, 21-passenger parlor coach, 21-passenger street car type pay-enter body. Represented by H. A. Fitzjohn, Geo. H. Hermanson, Chas. H. Thunfors.

FOUR-WAY LOCK COMPANY, 4900 Lexington Avenue, Cleveland, Ohio. **Space 668.** Padlocks, cylinders, night latches, drawer locks, chest locks. Represented by W. T. Cook, W. Shaw, V. G. Cook, Jos. P. Muzzio.

FRASER ELECTRIC TRANSMISSION CORPORATION, 2269 Ashland Road, Cleveland, Ohio. **Space 662.** One complete Fraser electro-control unit; component parts for this unit; one 29-passenger bus in operation. Represented by E. M. Fraser, Walter C. Willard.

FREMONT METAL BODY COMPANY, Fremont, Ohio. **Space 477.** One de luxe model 1000 21-passenger observation parlor coach body mounted on Studebaker 76 bus chassis. Represented by Lawrence C. Freeh, Marshall H. Bixler, Clayton D. Beck.

FULLER & SONS MANUFACTURING COMPANY, Kalamazoo, Mich. **Space 424.** Latest models in bus, truck and taxicab transmissions, models being cutaway samples, electrically driven, to show full operation of clutch and transmission. Represented by W. H. Schmidt, G. A. Moerschel, L. A. Bixby, E. L. Ludvigsen, John H. Earle.

FYRE-FREEZ CORPORATION, 17 West 46th Street, New York, N. Y. **Space 316.** Carbon dioxide Fyre-Freez extinguishers. Represented by H. B. Teter, Lee C. Herrick, David Leerburger, Lester H. Carragan.

G

GENERAL ELECTRIC COMPANY, Schenectady, N. Y. **Space 113.** Supervisory control equipment, telemetering equipment, MC-2 air circuit breaker, FKR-55 oil circuit breakers, JR-25 high speed breaker, automatic sectionalizing switch, line material, carbon brushes, railway motors, gear reduction unit, constant oil level bearing, brushholders, control, resistors.

GENERAL MOTORS TRUCK COMPANY, Pontiac, Mich. **Spaces 412-419.** Type Y parlor coach, type Y chassis, type W chassis, type W parlor car, type W city service coach, type Z-240 chassis, type Z-240 parlor car, type Z-240 city service coach, gas-electric chassis, T-42 truck with line repair body, cut away sleeve valve engine. Represented by J. A. Ritchie, P. W. Seiler, G. A. Green, H. E. Listman, E. D. Rutherford, F. J. Brackett, C. A. Epperson, G. B. Fay, J. D. Trueblood, J. J. St. Croix, E. J. Stone, R. C. Snell, M. H. Allen, A. R. Blewett, J. I. Byers, J. G. Campbell, E. F. Drew, R. E. Fielder, L. L. Weidman, J. C. Watts, C. W. Ford, C. F. Knull, T. D. Lenehan, G. A. MacLean, F. W. McDonald, L. H. Reese, T. A. Slattery, C. R. Smith, I. P. Smith, R. S. Smith.

A. GILBERT & SONS BRASS FOUNDRY COMPANY, St. Louis, Mo. **Space 679.** Railroad car and engine bearings, armature and axle bearings, trolley wheels, check plates, journal bearings, ears, frogs, crossings, hangers, stick brass and bushings, babbitt metals, solders, fire extinguishers. Represented by Chas. F. Gilbert, D. M. Brydie, D. U. Browning, J. L. Morenz, H. M. Frank.

GLIDDEN COMPANY, Cleveland, Ohio. **Spaces 449, half of 451.** Bus body showing the latest development in finishing buses in the G. M. F. and Ripolin system as well as other items used on a bus, such as roof enamels, headlining enamels, inside finishers, etc.; panels showing other types of finishes. Represented by L. E. Dean, J. H. Lathe, J. O. Pope, J. L. Noon, E. P. Van Patten, C. H. Brethauer.

GLOBE TICKET COMPANY, 112 N. Twelfth Street, Philadelphia, Pa. **Spaces 279, 280.** Samples of the new transfers installed in Akron, Johnstown and Toledo; samples of the Buffalo transfers; full line of books, cash fare receipts and fare tickets. Represented by William P. Snow, David C. Spencer, Dan T. Morgan, Harry C. Battin, George C. Bowers, Frank W. Rugg.

W. S. GODWIN COMPANY, INC., Race and McComas Streets, Baltimore, Md. **Space 125.** Full sized models of different kinds of track paving protected with steel paving guards. Represented by W. S. Godwin, L. Perkins.

GOLD CAR HEATING & LIGHTING COMPANY, 220 36th Street, Brooklyn, N. Y. **Space 234.** Standard open coil electric heaters with interchangeable elements, electric heaters equipped with enclosed type elements, switches, ventilators, automatic temperature regulating system. Represented by E. B. Wilson, Franklin H. Smith.

GRAHAM BROTHERS, Detroit, Mich. **Space 420.** Street car type 21-passenger motor coach, 16-passenger parlor car type coach, 21-passenger inter-city type utility bus. Represented by A. H. Ferrandou, G. P. Anderson, Edward Kilroe, H. W. Hayes, F. Sage, S. B. Simpson, Harry Bonelli, D. C. McCallum, W. F. Marion, A. E. Cooney.

GRAMM MOTORS, INC., Lima, Ohio. **Space 659.** Type R-31, 236-in. wheel base chassis; type R-31, 236-in. wheel base parlor car coach. Represented by B. A. Gramm, W. J. Gramm, E. G. Crawford, A. B. Kinney, R. E. Schreider, W. J. Grover, H. E. Murray, H. E. Ream.

GRIFFIN WHEEL COMPANY, Chicago, Ill. **Space 106.** One 26-in. 325-lb. spoke wheel, one 33-in. 650-lb. double plate interurban wheel, one 33-in. single plate wheel with section cut out to show the chilled surface. Represented by A. A. Hale, C. P. Whitcomb, Frank Flinn, T. A. Amberg, G. Acker, Lee Saxton.

GUIDE MOTOR LAMP MANUFACTURING COMPANY, Cleveland, Ohio. **Space 685.** Actual operation and method of adjustment of Guide tilt ray headlamps for trucks and motor coaches; complete illuminated display of dome lamps, marker lamps and combination stop-tail lamps. Represented by C. J. McLaughlin, A. E. Harris, W. A. Roettinger.

GUNITE CORPORATION, Rockford, Ill. **Space 431.** Gunite, the graphitic steel; Gunite brake drums, clutch pressure plates. Represented by D. P. Forbes, J. A. Forbes, C. W. Rhoades.

H

HALE & KILBURN COMPANY, 1800 W. Lehigh Avenue, Philadelphia, Pa. **Spaces 215-217.** New type reversible cross seat, two-passenger chair for interurban use, two passenger interurban cross seat, double rotating chair, two-passenger stationary cross seat of semi-chair design, single chair, new types interurban parlor car chairs, double rotating chair with collapsible division armrest, regular cross type motor bus seats, double motor coach chairs, new type double motor bus chair with reclining backs, other types chairs and seats. Represented by W. M. Swope, R. F. Stubblebine, H. B. Gengenbach, R. O. Young, W. G. Flood.

HANNUM MANUFACTURING COMPANY, 60-80 Keefe Avenue, Milwaukee, Wis. **Space 631.** Auto bus and motor truck steering gears. Represented by J. P. Case, J. E. Cummings, Geo. H. Hannum, Glen G. Holt.

HASKELITE MANUFACTURING CORPORATION, 120 South La Salle Street, Chicago, Ill. **Space 401.** Haskelite, Plymetl and Aluminum-Plymetl; Haskelite roofs, headlinings, flooring, advertising racks, inside linings, bulkheads, dash boards, instrument boards and seats; Plymetl exterior waste panels, vestibule linings, sub-flooring and other applications. Represented by James R. Fitzpatrick, James J. Dunne, Lee C. Nash, Alberta E. Bustard, Charles B. Norris, Joseph A. Potchen, Gerald M. Hanrahan, Lyman G. Hill, Emory W. Stoner.

HERCULES MOTORS CORPORATION, Canton, Ohio and Los Angeles, Cal. **Space 495.** Six-cylinder heavy-duty engines, models XYC, 4⅛-in.x4½-in., WXC, 4-in.x4½-in., WXD, 3¾-in.x4½-in.; crankshafts, pistons, bearings, connecting rods, oil pump, water pump, etc. Represented by Charles Balough, John Keplinger, Dave Latta, C. R. Schuler.

HEYWOOD - WAKEFIELD COMPANY, 209 Washington Street, Boston, Mass. **Space 206 A.** Seats and seating for electric railways and buses, canvas lined and unlined rattan car seat webbing, rattan for snow sweepers. Represented by George E. Cornwall, Bertram Berry, C. E. Preble, T. D. Owler, J. V. Conway, W. E. Foreman.

H. H. TROLLEY SUPPLY COMPANY, 1965 East 66th Street, Cleveland, Ohio. **Space 643.** Trolley harps and wheels, trolley base, conductor seats, motorman seats. Represented by H. Holland.

HIGHWAY TRAILER COMPANY, Edgerton, Wis. **Space 310.** Highway earth boring machine and pole setter. Represented by W. S. Pedley, F. C. Gokey, C. W. Hammond, E. J. Shaffrank.

HILLIARD CORPORATION, 102 West Fourth Street. **Space 317.** Refinoroil, a fully automatic machine for reclaiming used crank case oil. Represented by Edward Mooers, Eugene H. Proulx, Eugene G. Ballard, Fred W. Dixon.

HUDSON ELECTRICAL HEATING CORPORATION, 11 West 42nd Street, New York, N. Y. **Space, half of 281.**

HUNT-SPILLER MANUFACTURING CORPORATION, 383 Dorchester Avenue, S, Boston, Mass. **Space 408.** Air furnace gun iron brake drums for trucks and buses, both wheel and propeller shaft types. Represented by Victor W. Ellet, Morris B. Brewster, Leroy Arringdale, Joseph Goostray.

HYATT ROLLER BEARING COMPANY, Newark, N. J. **Spaces 633-635.** Hyatt roller bearing journal boxes to fit standard A.E.R.E.A. pedestals, size for size; Hyatt roller bearings applied to electric railway motors, as well as Hyatt equipment employed in shop applications, like line shafting, machine tools, material handling systems, etc. Represented by H. K. Porter, C. A. Johnson, J. W. Wiley, V. N. DeLamater, R. F. Wilson, O. W. Young, R. J. Brittain, B. H. Lytle, J. M. Kelly, W. T. Long, L. L. Hill, H. M. Carroll.

LIST OF EXHIBITORS CONTINUED ON PAGE 496

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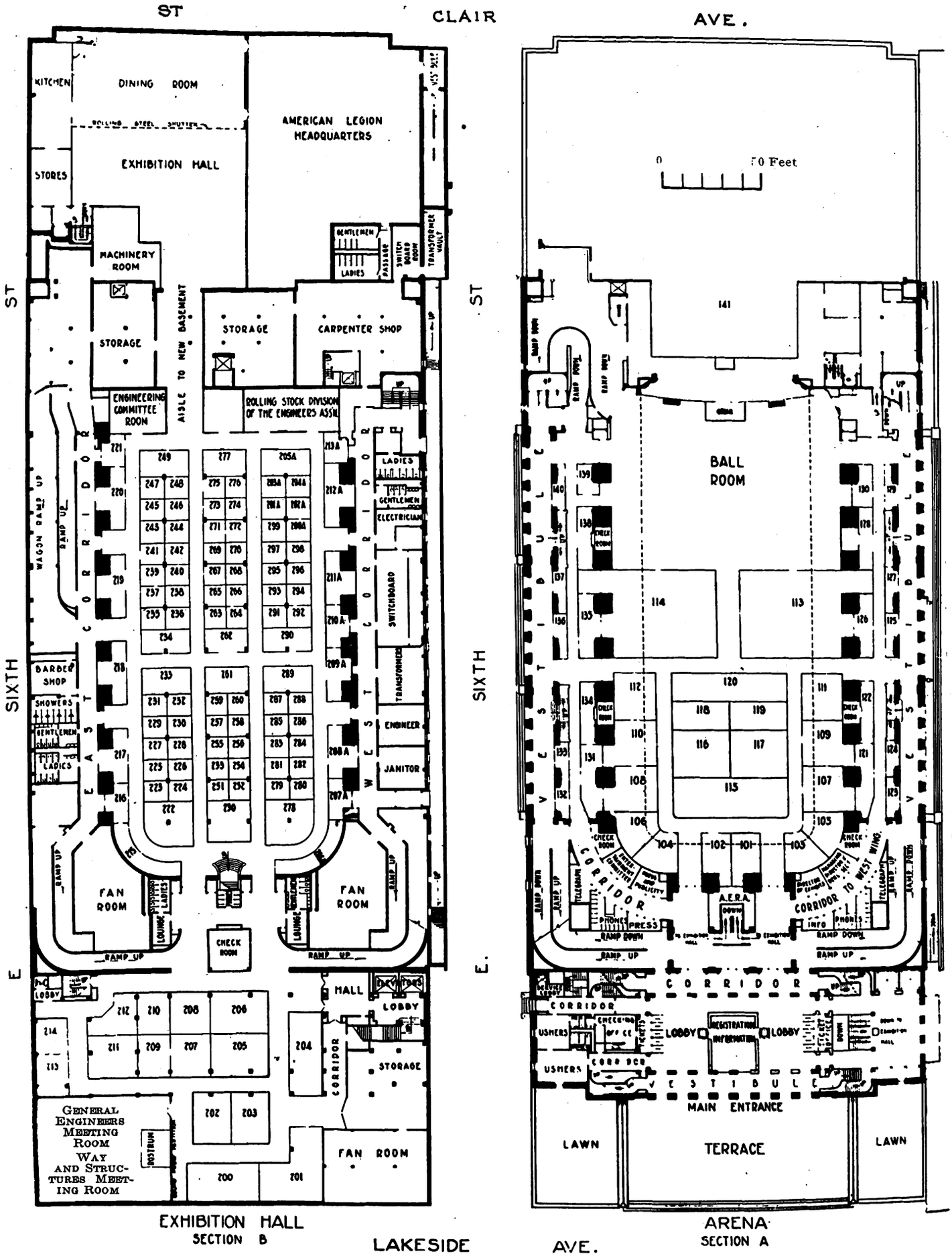
Space Divisions and Booth Numbers of the Cleveland Audi



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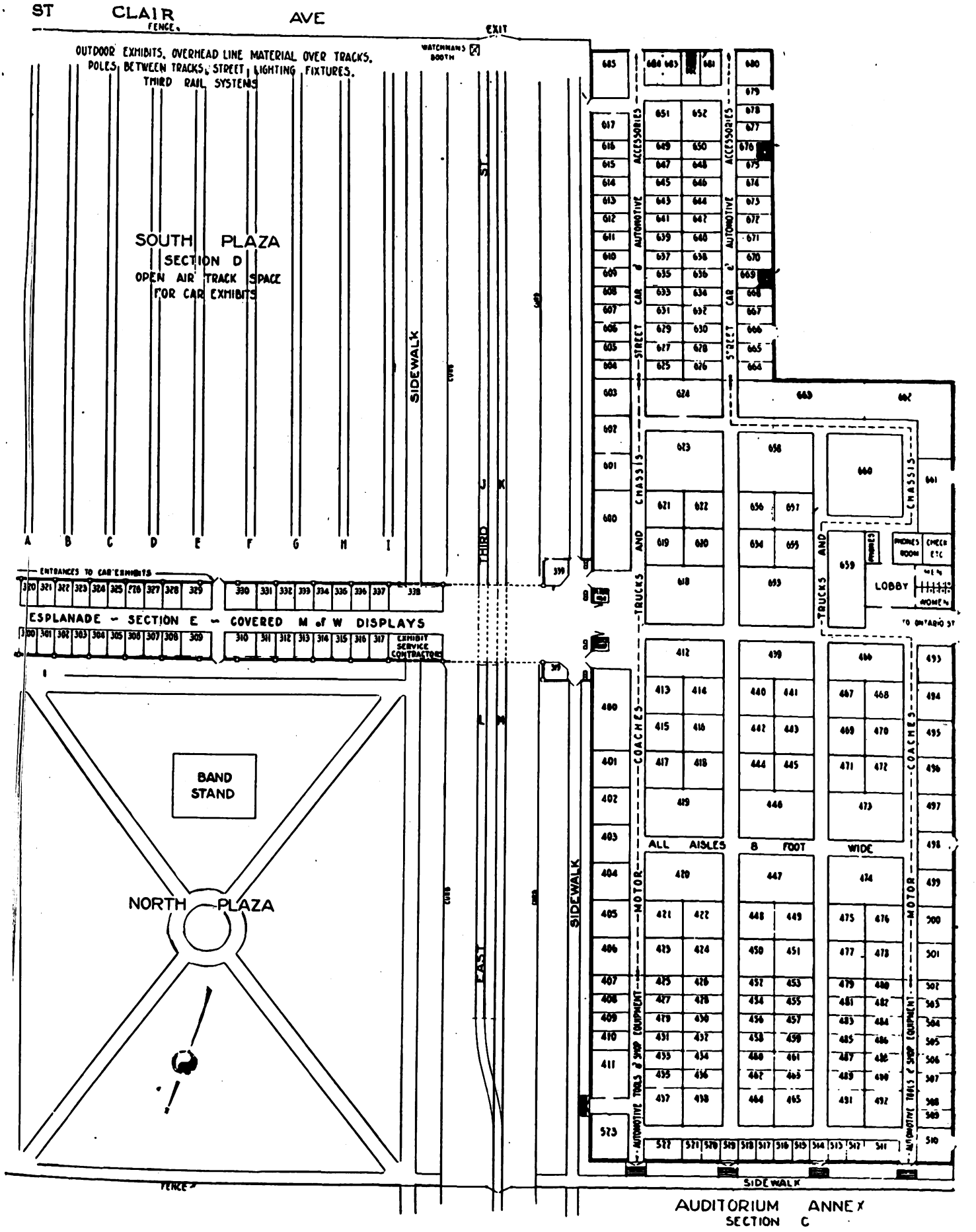
torium for the Exhibit of the 47th A.E.R.A. Convention



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Exhibitors at the 1928 Convention

CONTINUED FROM PAGE 493

HYNSON, WESTCOTT & DUNNING, Baltimore, Md. **Spaces 332, 333.** Mercurochrome, a germicide for treating and preventing infections. Represented by Nathaniel Nicolai, L. C. Shepherd, B. A. Hulsman, A. L. Johnson, Moffet, Duncan.

I

ILLINOIS TERMINAL RAILROAD SYSTEM, Springfield, Ill. **Track J.** Class C, 80-ton, articulated electric locomotive.

INTERNATIONAL REGISTER COMPANY, 15 South Throop Street, Chicago, Ill. **Space 127.** Fare registers, hand and electrically operated; International Cutawl and sundries. Represented by John Benham, W. E. Richmond, Chas. S. O'Neil.

INTERNATIONAL STEEL TIE COMPANY, 16702 Waterloo Road, Cleveland, Ohio. **Spaces 300-309.** Five types of Steel Twin Ties for standard construction and track renewal on old concrete base; latest model of the D. S. R. track layer, to be shown in operation; model A compression tamping machine, re-designed since 1927 exhibit, to be shown in operation; new heavy duty forged steel rail clip with full width heel and high tensile strength bolt; hot bent channels in all canted type ties. Represented by William P. Day, Thos. J. Clifford, Thos. J. Lavan, Fred H. Ogden, Vincent E. Heglaw, William P. Day, Jr., John J. Day, O. H. Neihus.

IRVING IRON WORKS COMPANY, Long Island City, N. Y. **Space 684.** Safkar steps, both rigid and folding, in steel and duralumin; Irvico steel mesh flooring for power plants, in unit panels and the continuous construction, using the Irving streamline splice; Irvico continuous armoring for concrete floors. Represented by L. H. DeVoe, Wm. Noblett, L. D. Stauffer.

J

JOHNS-MANVILLE CORPORATION, 292 Madison Avenue, New York, N. Y. **Space 680.** Asbestos brake lining, other applications.

JOHNSON FARE BOX COMPANY, 2 West 61st Street, New York, N. Y. **Space 652.** Fare boxes, coin changer, tokens.

JOHNSTON & JENNINGS COMPANY, 877 Addison Road, Cleveland, Ohio. **Space 503.** Type K Alten oil reclaimer, partially operated, showing finished oil coming through; type F 6 Alten oil reclaimer, showing its use for clarifying and reconditioning transformer oil; specimens of crank case, shop, transformer oils, new, dirty and reclaimed. Represented by A. H. Tennent, Robert Grameling, M. F. Lansill.

R. F. JOHNSTON PAINT COMPANY, Pearl and Main Streets, Cincinnati, Ohio. **Spaces 123, 124.** Painted panels. Represented by Leon L. Wolf.

K

KELTON - AURAND MANUFACTURING COMPANY, Bay City, Mich. **Space 426.** Seating equipment for motor coaches and electric cars. Represented by A. L. Harris, Chas. E. Stone.

L

LANG BODY COMPANY, 3088 West 106th Street, Cleveland, Ohio. **Space 447.** Bus body. Represented by C. E. J. Lang, E. J. Lang, H. B. Gehrke, Wm. C. Naegel, Wm. Dreger, H. Sponder, F. Weitz.

LEECE-NEVILLE COMPANY, 5363 Hamilton Avenue, Cleveland, Ohio. **Space, half of 624.** Generators, motors, switches, voltage regulators.

LORAIN STEEL COMPANY, Johnstown, Pa. **Spaces 207, 208.** 100-ft. radius manganese steel tongue switch, with Taurman switch lock attached; full size model of the switch heel; 200-ft. radius Folsom tongue switch; 200-ft. radius manganese steel tongue switch of the A.E.R.E.A. design; full size model of the heel of the Lorain tadpole tongue switch; portion of a street railway crossing cut in two through the chrome nickel insert plate, spelter, bolts and cast-iron binding, showing the method of insuring a full plate bearing and method of locking the bolts and nuts; display of chrome nickel insert plates and manganese steel plates, with freshly fractured samples of both; rail expansion joint of the Pittsburgh Railways pattern; samples of the girder and girder-groove rails. Represented by Wm. W. Kingston, J. T. Moore, S. P. McGough, W. H. Andrews, H. H. McDonald, Otto Fischer, R. E. Marshall, C. A. Rider, J. G. Vance, T. W. Brush, D. P. Steward, S. J. Cotsworth, L. M. Schrufer, Frank H. Lehecka, H. L. Gleeson, Carroll Burton, P. M. Boyd, E. B. Entwisle, H. C. Stiff, J. A. McHugh, H. F. A. Kleinschmidt, E. M. Stutzman, Edward Ott, C. R. Bossler, A. L. George.

M

MACDONALD MANUFACTURING COMPANY, 5015 Wellesley Avenue, S.E., Cleveland, Ohio. **Spaces 681, 682.** Cash receipt holders, zone check holders, transfer holders. Represented by M. Macdonald, E. M. Macdonald, M. Bregman.

MACK-INTERNATIONAL MOTOR TRUCK CORPORATION, MACK MOTOR TRUCK COMPANY, MACK TRUCKS, INC., INTERNATIONAL MOTOR COMPANY, 25 Broadway, New York, N. Y. **Spaces 439-446.** Trucks, buses, chassis, parts.

MANGANESE STEEL FORGE COMPANY, Richmond Street and Erie Avenue, Philadelphia, Pa. **Space 295.** Rol-Man rolled and forged manganese steel pedestal and journal box gibs; bolster and transom chafing plates and numerous examples of other applications of this steel; Rol-Man precision finished pins and bushings for brake gear and other parts. Represented by L. W. Jones, H. Howe.

MARTINDALE ELECTRIC COMPANY, 1260 W. 4th Street, Cleveland, Ohio. **Space 312.** Commutator undercutting, commutator grinding and armature slot cleaning devices, complete line of special electrical devices and electrical measuring instruments. Represented by H. McFarland, W. N. Osbun, P. W. Newell, R. O. Hallier.

MASSILLON STEEL CASTING COMPANY, Massillon, Ohio. **Space 489.** Brake drums.

JAS. H. MATTHEWS & COMPANY, 3942 Forbes Street, Pittsburgh, Pa. **Space 667.**

McGILL METAL COMPANY, Valparaiso, Ind. **Space 409.** Ball bearings, machine parts showing ball bearing applications, ball bearing testing machine. Represented by T. L. Robinson, Frank R. Schubert, W. E. Brownell, V. D. Gilmore.

METAL & THERMIT CORPORATION, 120 Broadway, New York, N. Y. **Spaces 324-329.** Material and equipment for thermit rail welding with complete layout showing method of installing welds and completed welds; working exhibit which shows the process of making the welds complete. Represented by F. W. Cohen, John B. Tinnon, J. H. Deppeler, D. C. Dickson, C. D. Young, H. D. Kelley, J. G. McCarty, R. L. Browne.

MONEY-METERS, INC., 5209 Book Tower, Detroit, Mich. **Space 122.** Fare collection meters.

MORTON MANUFACTURING COMPANY, 5105 - 5143 West Lake Street, Chicago, Ill. **Spaces 676, 677.** Chanarch aluminum and steel flooring, vestibule diaphragms, aluminum and steel car doors, aluminum and steel Kass safety treads, vestibule curtains and parts, window curtains and parts, window fixtures and weatherproofing, Morton suggestion system. Represented by H. U. Morton, Charles D. Morton, J. W. Davis, C. C. Below, C. S. Motter.

MOTOR WHEEL CORPORATION, Lansing, Mich. **Space 457.** Spoksteel drop-forged wheels for motor trucks and buses. Represented by R. G. Siple, Frank U. Winchester.

N

NACHOD AND U. S. SIGNAL COMPANY, INC., 4777 Louisville Avenue, Louisville, Ky. **Space 262.** Operative track models of single track car-counting and non-car-counting signals, double track signals, annunciator signal, stub-end signal, turn right signal, switch indicator, crossing gate model, highway crossing signal with single track car-counting or non-car-counting control, automatic headway recorder, flasher relays, mercury and air-break types, neutral and polar relays, overhead trolley contactors. Represented by Carl P. Nachod, R. E. Tafel, John A. Miller, E. C. Brown.

NATIONAL BRAKE COMPANY, INC., 888 Ellicott Square, Buffalo, N. Y. **Space 610.** Different types of Peacock brakes, Peacock improved brakes, Peacock staffless brakes in operation with dynamometers showing the actual power developed, Peacock No. 420 brake. Represented by F. D. Miller, W. D. Brewster.

NATIONAL CARBON COMPANY, INC., P. O. Box 400, Cleveland, Ohio. **Spaces 226, 228.** A complete line of National Pyramid carbon, graphite and metal-graphite brushes for motors, generators and converters and a complete display of carbon electrodes, rods, blocks and paste used in the electric arc and acetylene welding processes. Represented by E. A. Williford, J. A. Hammond, V. J. Nolan, E. C. Friday, J. L. Green, H. G. Cobb, W. C. Kalb.

NATIONAL CASH REGISTER COMPANY, Dayton, Ohio. **Spaces 611, 612.** National fare recording registers. Represented by A. B. Gary, H. F. Heil, G. A. Rauch, A. A. Keiser.

NATIONAL MALLEABLE & STEEL CASTINGS COMPANY, Cleveland, Ohio. **Space 465.** Metal wheels. Represented by J. H. Jaschka, J. W. Holt, E. H. Sherwood, D. W. Robinson, C. Glick, L. L. McKee.

NATIONAL PNEUMATIC COMPANY, Graybar Building, New York, N. Y. **Spaces 107, 109, 111.** Standard door engines; constant speed door engine; differential door engines; control switches; treadles, featuring the full floating treadle; safety interlocking features; signal lights; pipe bending tools; door switches; door tracks; universal control valve; 600-volt magnet valves, safety control unit for buses; safety reversing device for folding doors. Represented by T. W. Casey, Frank Johnson, J. H. Vander Veer, T. Laurent, T. Clifford Laurent, Michael Griffin, A. Frank Paul, George W. Hall, H. D. Mallison, Wm. J. Campbell, O. A. Broten, R. S. Frehse, Frank E. Casey, P. R. Forman, L. DeWinner, J. R. Newkirk, H. J. Nimzik, E. G. Parvin, R. D. Conklin, Horace R. Hockley.

NATIONAL RAILWAY APPLIANCE COMPANY, 420 Lexington Avenue, New York, N. Y. **Space, part of 117.** NSD gong ringer, Bell fare box, Godward gas generator, Garland ventilators, Tapley performance and brake testing meters, National hand holds. Represented by B. A. Hegeman, Jr., H. A. Hegeman, A. B. Kroeger, J. M. Pratt, R. H. Stier, F. M. Richards, M. Garland.

NEW DEPARTURE MANUFACTURING COMPANY, 269 North Main Street, Bristol, Conn. **Space, half of 624.** Complete line of New Departure ball bearings in double row, single row, radax and magneto types. Represented by Lisle H. Gaylord, John Collins and others.

NICHOLS - LINTERN COMPANY, 7960 Lorain Avenue, Cleveland, Ohio. **Space 672.** Motor coach heaters, roof ventilators, street car ventilators, indicating signals, air and mechanical sanders, universal lanterns, electric fans for motor coach use. Represented by Wm. Lintern, J. B. Lintern, A. R. Lintern, Geo. D. Lintern, W. A. Lintern, W. E. Foreman, A. L. Lye.

NORMA-HOFFMANN BEARINGS CORPORATION, Stamford, Conn. **Spaces 613, 614.** Complete line of Norma open and closed type ball bearings as used in electric railway accessories as well as bus transmissions, generators, etc.; Hoffmann roller bearings in the various types suitable for railway axles and motors, as well as heavy duty applications in bus design; typical mountings of these bearings, made in section to illustrate the principles of correct bearing design and application. Represented by C. P. Wilson, Norman Bell, D. E. Batesole, R. E. Hecker, C. D. Kilham, F. W. Mesinger, T. J. Harley.

NORTH EAST ELECTRIC COMPANY, 379 Lyell Avenue, Rochester, N. Y. **Space 608, 609.** Generators, starting motors, ignition horns, control units. Represented by J. C. Halbleib, L. H. Guilford, I. W. Dietz, D. P. Cartwright, E. C. Kehoe.

NORTHERN GRANITE & STONE COMPANY, 1022 Hanna Building, Cleveland, Ohio. **Space 334.** Granite paving block, steel reinforcing, patching material.

R. D. NUTTALL COMPANY, East Pittsburgh, Pa. **Space 110.** Standard BP helical gear; similar gear with noiseless feature.

O

OHIO BRASS COMPANY, Mansfield, Ohio. **Space 115.** Spring lock hanger, duplex trolley frog, feeder dead-end clamp, Hevi-Bed Titon band, AW-15 cross bond, renewable underrun section insulator, Spangrip clamp and lashing, pole sleeve, lightweight trolley base; other equipment, including line materials, rail bonds, headlights, car equipment. Represented by J. R. Palmer, L. W. Birch, G. L. Draffan, A. L. Price, C. H. Tomlinson, E. F. Wickwire, J. H. Drew, C. H. Burkhalter, E. G. Dels, E. W. Loughridge, M. McCormick, A. J. Knight, W. B. Fincher, J. L. Hogan, D. MacLaughlin, J. M. Mellor, H. C. Parker, T. W. Passailaigue, P. L. Warren, G.

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E. Willis, S. L. Walworth, J. H. Walker, H. R. Sampson, E. C. Brown, R. F. Gheen, F. A. Strail, F. Attwood, S. S. Matthes, E. A. Larrson, W. P. Bovard, F. L Wolf, C. C. Beck.

OHMER FARE REGISTER COMPANY, Dayton, Ohio. **Spaces 250-256.** Nine types of standard indicating and printing fare registers; six types of No. 79 ticket printing registers; ten types of No. 80 ticket printing registers; two types of No. 232 ticket office ticket printers; printing and non-printing taximeters; mileage recording instruments for motor buses, commercial vehicles, steam and electric railway cars; fare boxes and industrial counters. Represented by John F. Ohmer, R. L. Hubler, R. M. Ohmer, C. W. Ketteman, I. F. Lutz, Geo. F. Jacobs, R. T. Abrell, H. S. Sibley, L. P. Stickel, others.

OIL JACK COMPANY, INC., 15 Park Row, New York, N. Y. **Space 410.** Jacks.

OKONITE COMPANY, OKONITE-CALLENDER CABLE COMPANY, INC., 501 Fifth Avenue, New York, N. Y. **Space 219.** Samples of rubber covered and varnished cambric insulated wire and cable; friction and rubber insulating tapes; Okocord: samples of impregnated paper and super-tension cables; splicing materials, junction boxes, splices, etc. for all voltages. Represented by J. D. Underhill. W. R. Van Steenburgh, F. J. White, Ray Baker, R. M. Johnson.

OLIVER IRON AND STEEL CORPORATION, South Tenth and Muriel Streets, Pittsburgh, Pa. **Space 233.** Black and Monel metal bolts, nuts and rivets; forgings, track tools and complete line of pole line hardware and construction specialties. Represented by Warren M. Heim, Clarence E. Guthridge. Hanson Thomas, Joseph R. Hileman.

OSGOOD BRADLEY CAR COMPANY, 351 Mountain Street, Worcester, Mass. **Track G.** One 1929 model double-truck, one-man, two-man electric car. Represented by John E. Bradley, William J. McKee, C. H. Turner, S. B. Wight, Jr.

P

PANTASOTE COMPANY, INC., 250 Park Avenue, New York, N. Y. **Space 204.** Pantasote curtain and upholstery material; Agasote headlining and wainscoting; exhibit of the proper and improper way of applying Agasote. Represented by William A. Lake, William Anderson, Herbert G. Mastin, H. H. Horn.

PEREY MANUFACTURING COMPANY, INC., 101 Park Avenue, New York, N. Y. **Spaces 223, 224.** Mechanical and electrical turnstiles, passimeters, coin boxes.

PITTSBURGH PLATE GLASS COMPANY, Pittsburgh, Pa.,

PITTSBURGH SAFETY GLASS COMPANY, Creighton, Pa. **Space 625.** Duplate glass; non-shattering glass for windows; modern color schemes, exposed panels and street railway products. Represented by W. D. Snyder, F. A. Derfus, A. Nelson, Carl E. Schaefer.

R

RADEL LEATHER MANUFACTURING COMPANY, Newark, N. J. **Space 670.** Upholstery leathers in various colors and designs; Calfiyke leathers, in several color shades; Turkish Vellet leathers; Spanish and Capitol grains; de luxe bus leathers, Brilliantones. Represented by Frank J. Radel, Thomas A. Sullivan, O. R. Overmyer, J. E. Menaugh.

Last year, seat manufacturers displayed luxurious, comfortable seats, to meet present-day demands. This year's display even shows an advance in this trend

RAIL JOINT COMPANY, 165 Broadway, New York, N. Y. **Space 209.** Continuous joints and special plates of the latest designs for welding. Represented by E. A. Condit, Jr., Alex Chapman, R. R. Seward, C. A. Disbrow, district sales agents.

"RAILWAY AGE," 30 Church Street, New York, N. Y. **Space 464.** Copies of *Railway Age, Railway Mechanical Engineer, Railway Engineering and Maintenance, Railway Electrical Engineer, Railway Signaling.*

RAILWAY MATERIALS CORPORATION, Toledo, Ohio. **Spaces 291, 293.** Brake shoes and brake heads. Represented by E. C. Folsom, R. O. Polsdorfer, J. E. Hyatt, H. E. Locey, C. A. Ernsthausen.

"RAILWAY PURCHASES & STORES," 9 South Clinton Street, Chicago, Ill. **Space 669.** Magazines. Represented by H. B. Kirkland, K. F. Sheeran, J. D. Murphy, Jr., Edward Wray.

RAILWAY TRACK - WORK COMPANY, 3132 East Thompson Street, Philadelphia, Pa. **Spaces 320-323.** Vulcan rail joint grinder, Eureka radial rail grinder, Atlas rail grinder, Ajax electric arc welder. Represented by W. B. Goodall, A. M. Nardini, H. M. Moorhead, C. H. Wood.

RAILWAY UTILITY COMPANY, 2241-2247 Indiana Avenue, Chicago, Ill. **Spaces 313, 314.** Utility heaters, heat regulators, ventilators, and ground detectors. Chromalox strip heaters, Chromalox rheostat heaters. Represented by E. J. Magerstadt, J. H. Denton, W. J. Pine, W. G. Hartwig, Earl G. Magerstadt, R. R. Holden, Edwin L. Wiegand, E. N. Calhoun.

READE MANUFACTURING COMPANY, 135 Hoboken Avenue, Jersey City, N. J. **Space 641.** Miniature track spraying equipment, Reade non-poisonous weed killer. Represented by R. W. Pritchard, C. H. Reade.

H. H. ROBERTSON COMPANY, 511 Wood Street, Pittsburgh, Pa. **Space 296.** Ventilating and daylighting of buildings; Robertson ventilators, skylights and sidewall sash. Represented by F. C. Russell, A. R. Gray, Pierre Blommers, H. F. Hackerdorn, Jr., H. G. Raybon.

ROOT SPRING SCRAPER COMPANY, Kalamazoo, Mich. **Space 315.** Short blade snow scraper, air-operated Root all-spring steel life-guard. Represented by E. A. Weeks, Marie J. Root.

ROSS GEAR & TOOL COMPANY, 18701 Winslow Road, Cleveland, Ohio. **Space 626.** Steering gears.

RUSSELL MANUFACTURING COMPANY, Middletown, Conn. **Space 429.** Clutch facings, brake lining, fan belts, waterproof straps, webbing, hood lacing, tow lines. Represented by Frank Fuhrman.

S

SAFETY CAR DEVICES COMPANY, Wilmerding, Pa. **Space, half of 108.** Braking equipment.

SAF-T-CAB CORPORATION 1330 Terminal Tower, Cleveland, Ohio. **Spaces 448-450.** Saf-T-Cab, Saf-T-Bus. Represented by Bernard D. Deweese.

ST. LOUIS CAR COMPANY, St. Louis, Mo. **Space 105.** Car seats in Space 105; interurban car and city car in track exhibit. Represented by Edwin B. Meissner, George L. Kippenberger, Howard R. Gass, Morrison J. Oswald.

SANFORD MILLS, Sanford, Me. Selling Agents: L. C. Chase & Co., Boston, Mass. **Space 405.** Mohair upholstery fabrics, artificial leather. Represented by Eldon Campbell, Walter Scott.

SATTLEY COMPANY, 3246 East Woodbridge Street, Detroit, Mich. **Space 126.** Coin counting, coin sorting and coin wrapping machines; coin wrappers. Represented by Daniel W. Smith, W. Bruce Howard, A. F. Hugart, J. J. Bannert.

S.K.F. INDUSTRIES, INC., 40 East 34th Street, New York, N. Y. **Spaces 236, 238.** Car truck and railway motors equipped with S.K.F. bearings; other heavy duty applications of S.K.F. anti-friction bearings. Represented by H. A. Allen, R. R. Hirsch, W. F. Temple, R. R. Zisette.

SKINNER AUTOMOTIVE DEVICE COMPANY, INC., 2225 Dalzelle, Detroit, Mich. **Space 479.** Skinner oil reclaimer, an automatic electrically operated machine for renewing crankcase oil. Represented by Robert G. Gregory, Frank Brazel, Wm. W. Sanford.

PETER SMITH HEATER & MANUFACTURING COMPANY, 10501 Haggerty Avenue, Fordson, Mich. **Space 338.** Heaters. Represented by E. J. Smith, E. O. Merline, Morris Eastwood, B. F. Carville.

SNAP-ON WRENCH COMPANY, 14 East Jackson Boulevard, Chicago, Ill. **Space 428.** Complete line of Snap-on socket wrenches for hand operation, including special thin walled sockets; shanks and sockets for use with electric and pneumatic motors, Blue Point end wrenches, Boxocket wrenches, other hand tools; moving display, showing the construction and operation of Snap-on ratchet wrenches; tool boxes, cases and cabinets. Represented by C. H. Tennyson, E. A. Glenn, A. M. Crandall, Joseph Johnson, E. S. Hansen.

SOUTH BEND LATHE WORKS, 425 East Madison Street, South Bend, Ind. **Spaces 453, 455.** Lathes.

STANDARD OIL COMPANY (Indiana), 910 South Michigan Avenue, Chicago, Ill. **Space 227.**

STANDARD STEEL WORKS COMPANY, Philadelphia, Pa. **Space 207 A.** Light-weight, rolled steel, 26-in. wheel, showing noise-deadening feature, as used by Delaware Electric Power Company; armature shafts of quenched and tempered carbon steel. Represented by G. J. F. Carpenter, W. H. Evans, C. E. Hale, L. W. Metzger, Jr., H. J. Snowden, R. N. Watt.

STATE AND SECTIONAL ASSOCIATIONS. See page 498.

STUDEBAKER CORPORATION OF AMERICA, South Bend, Ind. **Spaces 474-476.** Inter-city de luxe coach for 20 passengers on the 75 heavy duty bus chassis, 21-passenger street car bus on 75 chassis, 75 heavy duty bus chassis, "Seminole" 22-passenger parlor observation car on 76 special bus chassis. Represented by Charles H. Wondries, Paul H. Castner, J. L. Engels, C. H. Miller, F. C. French, H. E. Kopman, T. E. Connor, Jos. Swanson, J. R. Lake.

SWARTWOUT COMPANY, 18511 Euclid Avenue, Cleveland, Ohio. **Spaces 264, 266.** Swartwout rotary ball bearing ventilators. Represented by D. K. Swartwout, Jr., L. P. Russon, E. N. Walton.

T

TEXAS COMPANY, 17 Battery Place, New York, N. Y. **Spaces 128, 130.** Display of electric railway lubricants, bus oils, automotive oils. Represented by George R. Rowland, T. C. Dick, A. F. Brewer, Dr. R. Haskell, William Harrigan, P. B. Bowman, C. E. Smith, H. E. Mead, J. F. Lamb, W. H. Goebel, N. H. Steindler, H. E. Delcour, J. W. McGuire, C. R. Schablitzke, H. A. Guba, F. R. Splawn.

TIMKEN-DETROIT AXLE COMPANY, 100-400 Clark Avenue, Detroit, Mich. **Space 400.** Bus front axles, equipped

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Exhibitors at the 1928 Convention

with brakes; bus rear axles, both bevel and worm gear; worm gearing that has carried bus 585,000 miles; model 51 truck for electric railway cars (this model superseding model 50), equipped with 64011-W worm drive axles (superseding 64010-W axles). Represented by P. W. Hood, Wm. Bonn, Nelson R. Brownyer, Chas. S. Dahlquist, L. W. Fischer, George E. Fox, Rex S. Gay, Gabe Hilton, Charles E. Hoffer, Robert Koeppen, Wm. L. Love, P. W. Sloan, John S. Wardwell, George E. Watts.

TIMKEN ROLLER BEARING COMPANY, Canton, Ohio. **Spaces 673, 674.** Built up display, showing a mountain scene with an electric train in actual operation on the mountain side and a city in the foreground; assortment of Timken bearings. Represented by H. J. Porter, J. W. Spray, E. W. Austin, Guy Waters, W. C. Sanders, Ernest Wooler, R. P. Kelley, Frank Druar.

TOOL STEEL GEAR & PINION COMPANY, Elmwood Place, Cincinnati, Ohio. **Space, part of 116.** Single reduction driving unit for high-speed motors; tool steel quiet gears; dictaphone installation to demonstrate noise eliminating through quiet gears; wisdom tooth pinions. Represented by C. E. Sawtelle, LeRoy Brooks, Jr., E. S. Sawtelle, P. H. Conroy, H. G. Ross, J. P. Biggert, W. H. Evans, Eric Dilger, J. L. Lundberg, A. E. Forester, R. L. Reichling.

TUCO PRODUCTS CORPORATION, 30 Church Street, New York, N. Y. **Space 644.** Tuco Flexolith composition flooring for motor coaches and street cars, Tuco National standard waterproof canvas roofing, car window screens, insulation. Represented by D. W. Pye, H. B. Chamberlain, R. F. O'Leary, W. Byrnes, E. J. Corcoran, C. H. Kadie, R. Gaines, T. L. Miller, C. M. Schramm, H. B. Wilson.

TWIN COACH CORPORATION, Kent, Ohio. **Spaces 466-473 and track space.** Twin Coach parlor car; standard 41-passenger urban coach; urban coach with a section cut away to show body construction, engine mountings and other details of operating units; trackless trolley; two automotive rail street cars, one with four 35-hp. motors, the other with two 50-hp. motors; new 60-hp., 6 cylinder engine. Represented by F. R. Fageol, W. B. Fageol, Ross Schram, J. Allan Smith, E. W. Bradley, P. H. Brehm, E. S. Rider, W. E. Brown, O. R. Fageol, R. C. Smith, C. H. Fageol, H. B. McKelvey, B. V. Bassett, H. E. Simi, E. B. Loveland, H. M. Gill, Wm. Doyle, P. H. Manske, J. H. Stakes, C. O. Sparhawk, Thos. Owen, H. P. Kane, W. Carlson, A. E. Brehm.

U

UNA WELDING & BONDING COMPANY, 1615 Collamer Avenue, Cleveland, Ohio. **Spaces 336, 337.** Rail joints, welders, Goodspeed automatic welding head, a.c.-d.c. welders, automatic welding rod, die rod, rod 700 for manganese welding, rod 200 for rail joint welding, rod 300 for building up cupped rails, other rods for various welding purposes. Represented by E. R. Alexander, E. W. Kronbach, L. S. Burgett, J. B. Austin, A. A. Probeck.

UNION METAL MANUFACTURING COMPANY, Canton, Ohio. **Space 651.** Fluted steel distribution and transmission poles in the outdoor track space; indoor exhibit, sample sections of these poles with a complete line of fittings. Represented by W. A. Porterfield, D. C. Barrick, C. E. Moran, E. W. Riemenschneider, E. H. Crider, A. S. Fromm.

UNIVERSAL LUBRICATING COMPANY, 1400 Schofield Building, Cleveland, Ohio. **Spaces 292, 294.** Two pinion end and two commutator end bearings. Represented by S. W. Scofield, T. H. J. Williams, E. Dreher, H. H. Lytle, G. F. Lytle, J. C. Dalgen, J. Graham, F. T. Twerell.

V

VAN DORN COUPLER COMPANY, 2325 South Paulina Street, Chicago, Ill. **Space 261.** Complete line of radial M. C. B. couplers, car air and electric couplers, pin and link couplers, M. C. B. couplers for gasoline motor rail cars; also the latest design of car air and electric couplers. Represented by B. W. Sullards, H. E. Van Dorn.

VERSARE CORPORATION, Albany, N. Y. **Space 660.** Gas-electric coach for service at Cincinnati, Ohio; skeleton gas-electric coach, showing structural design; 43-passenger electric coach duplicate of those operating in Salt Lake City; 36-passenger electric coach, with Versare opposed motor drive. Represented by Frederic Pruyn, O. F. Warhus, R. MacDonald, R. H. Nash, H. W. Fero, Edw. I. Barton, R. R. Schemerhorn, C. G. Bordeaux.

W

WALTER MOTOR TRUCK COMPANY, Queens Boulevard & 37th Street, Long Island City, N. Y. **Space, half of 663.** Walter snow fighter. Represented by Maurice Walter, J. H. Sharkey, R. T. Carroll, B. A. Hegeman, Jr., H. A. Hegeman, J. M. Pratt.

WAUKESHA MOTOR COMPANY, Waukesha, Wis. **Space 493.** Two bus engines of 120 hp. and 75 hp. capacity, a larger six-cylinder engine for high power, engine parts. Represented by P. C. Ritchie, J. G. Swain, J. E. DeLong, J. M. Boorse, C. P. Ross, L. M. Ward, J. B. Fisher, L. Bower, L. M. Kanters.

WESTINGHOUSE COMPANIES,

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, East Pittsburgh, Pa. **Spaces 112, 114.** W-N drive unit, car and bus motors, control equipment, line material, high-speed circuit-breaker, arc welding equipment, linestart motor and linestarter display, portable meters, oil testing outfit, porcelain insulators, lightning arresters, Micarta display, Hollow-spun poles, Osiso and renewal parts. Represented by executives, district office representatives and headquarters sales and engineering department representatives.

WESTINGHOUSE TRACTION BRAKE COMPANY, Wilmerding, Pa. **Space, half of 108.** Variable load brake; brake cylinder dust protector; automatic car, air and electric coupler; pneuphonic air horns; Wabco brake cylinder packing cups and gaskets; automotive pressure brakes and vacuum brakes for buses, trucks and pleasure cars. Represented by headquarter's executives, district sales representatives and engineers.

WM. WHARTON JR. & CO., INC., Easton, Pa. **Space 222.** Proposed standard A.E.R.E.A. tongue switch, 100 ft. radius, equipped with type "N" lockbox; one-half solid manganese steel crossing, street over steam; keyed center iron bound frog, with cast iron body; manganese steel switch point, similar to those furnished for the Broad Street Subway in Philadelphia; seamless steel cylinders for high pressure gases. Represented by J. R. Smith, A. L. Bray, R. C. McCloy, Chas. N. Shaffner, H. F. McDermott, Chas. H. Wood, Chas. M. Griffith.

WHEEL TRUING BRAKE SHOE COMPANY, 219 Tuxedo Avenue, Detroit, Mich. **Space 282.** Abrasive brake shoes for all conditions of wheel wear. Represented by Judson M. Griffin, F. F. Griffin, O. Perry Allen.

WHITCOMB WHEEL COMPANY, 1911 65th Street, Kenosha, Wis. **Space 661.** Six-wheel, light-weight motor coach, with independently sprung front wheels and unit body and chassis construction. Represented by James A. Whitcomb, H. J. Goodyer, Irving Puerner, R. T. Van Lone, J. C. Whitcomb, Thelma G. Whitcomb.

WHITE COMPANY, Cleveland, Ohio. **Spaces 653-658.** White bus chassis, both 4 and 6-cylinder models, with and without bodies; bodies of street car and parlor car types; truck chassis of various capacities, with and without bodies, including model 58, new high-speed heavy duty chassis. Represented by Walter C. White, Saunders Jones, Stanley P. Seward, W. A. Maynard, R. W. Knowles, G. R. Bryan, J. N. Bauman, V. W. Fries, L. G. Avery, A. J. Scaife, M. D. Munn, J. T. Swigart.

WHITEHEAD & KALES COMPANY, River Rouge, Mich. **Space 504.**

WHITE MANUFACTURING COMPANY, Elkhart, Ind. **Space 268.** Truck and brake pins and bushings, side and center bearings, trolley harps, track sanders, chafing plates, wire connectors, oil burning torches, tar kettles, concrete mixer heaters, switch heaters. Represented by W. McK. White, M. R. Elliott.

WILLARD STORAGE BATTERY COMPANY, 246 East 131st Street, Cleveland, Ohio. **Space 639.** Standard line of heavy and medium plate bus batteries for buses, trucks, oil-switch operation, emergency system, power and signal work. Represented by R. J. Nightingale, C. T. Klug, C. F. Oestermeyer, E. M. Sutherland, M. J. Brennan, A. E. Harrold, S. C. Aikenhead.

C. H. WILL MOTORS CORPORATION, 1030 Ramsey Street, Northeast, Minneapolis, Minn. **Space 634.** Tropic-Aire hot water heaters for motor buses and passenger cars, one of the heaters being installed and operating. Represented by C. H. Will, C. M. Yerxa, Edmund Burke, V. J. Butterfield.

WILSON - IMPERIAL COMPANY, 115 Chestnut Street, Newark, N. J. **Space 129.** Car cleaning materials. Represented by D. J. Giles, Frank Sherritt, Chas. A. Beaumont.

ALAN WOOD IRON & STEEL COMPANY, Widener Building, Philadelphia, Pa. **Space, half of 501.** Steel floor, formed steps, runner boards, trolley steps, etc., adaptable for buses, trucks and street cars; samples of the AW Standard Diamond and AW Diamondette floor plates. Represented by J. Raymond Jones, Geo. Clinton Fogwell, Willard S. Haring.

Z

ZENITH-DETROIT CORPORATION, Detroit, Mich. **Space 628.** Carburetors, fuel filters. Represented by V. I. Shobe, F. M. Ruby, H. S. Manwaring, B. Hannah, C. C. Sands.

A.E.R.A. and Other Associations Exhibiting

The following departments and committees of the American Electric Railway Association have exhibits or reception spaces:

American Association, Committee on Education. Spaces 636, 638, 640, 642.

American Association, Publicity and Advertising Department. Spaces 201, 411, 508-510, 523.

American Association, Statistical Department. Main lobby, both sides of stairway.

Engineering Association, Division of Purchases and Stores. Space 200. Delineascope, displaying view of stores building, stores layout and material handling devices of many electric railways. Represented by W. V. Shoemaker.

Engineering Association, Rolling Stock Special Committee No. 4, Lighting. Space 212A. Various lighting equipment.

Engineering Association, Rolling Stock Special Committee No. 9, Noise Reduction. Space 205.

Engineering Association, Way and Structures Special Committee No. 2, Special Trackwork. Space 205.

Engineering Association, Way and Structures Special Committee on Welded Rail Joints. Space 205.

Joint Committee of National Utility Associations. Space 267.

The following associations are represented, some with exhibits, others with reception space only:

American Automobile Association, National Motor Bus Division. Spaces 515-518.

Arkansas Utilities Association. Spaces 297, 298.

Canadian Electric Railway Association. Space 218.

Central Electric Railway Association. Space 220.

Illinois Electric Railway Association. Spaces 245, 247.

Indiana Public Utility Association. Spaces 235, 237.

Iowa Electric Railway Association. Spaces 203A, 204A.

Maryland Utilities Association. Spaces 241, 242.

Midwest Electric Railway Association. Spaces 269, 270.

Missouri Association of Public Utilities. Spaces 200A, 299.

New England Street Railway Club. Space 290.

Oklahoma Utilities Association. Spaces 201A, 202A.

Pennsylvania Street Railway Association. Spaces 239, 240.

Public Utilities Association of Virginia. Spaces 243, 244.

Southwestern Public Service Association. Space 205A.

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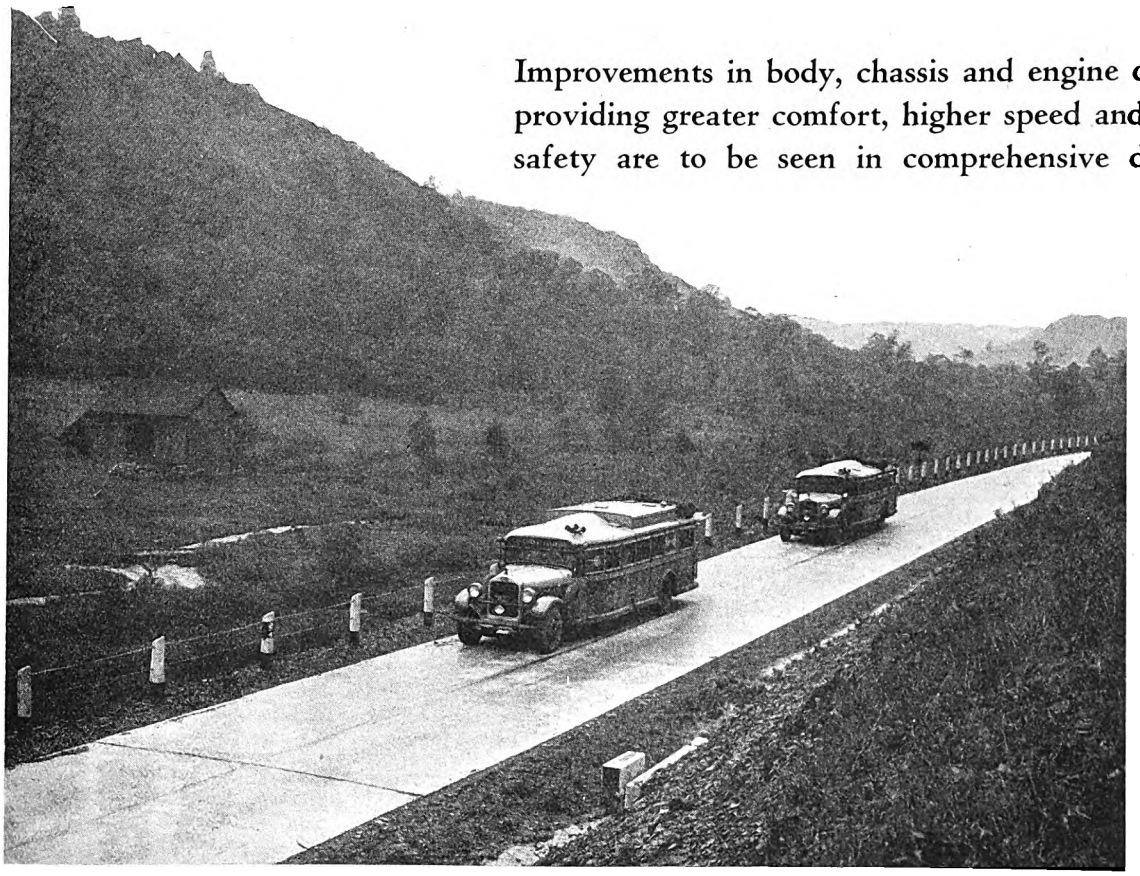
NEW BUSES OF MANY TYPES Hold Attention

Improvements in body, chassis and engine **design,** providing greater comfort, higher speed and **more** safety are to be seen in comprehensive **display**



White chassis with Bender bodies speeding through the beautiful Pocono Mountains

BUS riders of today are demanding more than mere transportation. This is evidenced by the impressive display of bus bodies and equipment. Commodious, restful seats, full vision windows and adequate illumination, ample ventilation and sufficient warmth, wider aisles and proper headroom; these requisites, together with attractive appearance, inside and out are, to the passenger, fully as important as a dependable engine and a sturdily built chassis. That bus manufacturers have kept pace with these demands is demonstrated by advances in bodies, chassis and accessories exhibited at this year's convention. In body design the ends of beauty as well as utility have been better served, and the conflict between capacity and comfort appears to have been decided definitely in favor of the latter.

The increasing importance of long distance riding is reflected in the attention that is given to the care of baggage. Unusual arrangements have been devised to permit of carrying suit cases and parcels inside the body and, where it is still necessary to carry excess luggage on the roof, substantial inclosed receptacles have replaced the railed inclosures and loose canvas covers of a few years ago. Safety features have not been overlooked, as is evidenced by improvements in brake design and the use of metal in body construction.

The General Motors Truck Company is represented by its full line of city and parlor car types of bodies and chassis. Here are the familiar Yellow Coaches, types Y and Z, in addition to which there is shown the recently developed type W. This latter, shown in both parlor and city types, was brought out in recognition of the demand for a small, high quality bus. The special feature is the use of the Cadillac eight-cylinder V-type power plant, modified as necessary, to meet motor coach requirements. The type W parlor coach has an over-all length of body of 18 ft., over-all width of 84 in., and headroom of 68 in. Leather-upholstered bucket seats are arranged in pairs on one side of the aisle and singly on the other, accommodating a total of seventeen passengers. Four more can be seated by the use of drop seats. The type W for city service has an over-all body length of 23 ft. 8 in., over-all width of 90 in., and headroom of 76½ in. Accessories include rear vision mirror and a heating system of the electric blower type, eliminating all pipes inside the body. A new outboard mounting for the front spring suspension has been developed. The springs are shackled at the front to a heavy channel cross member outside the chassis frame instead of directly under it. Other features are an oversize, underslung, worm-driven rear axle, a four-speed transmission, a multiple-disk clutch with special lubrication. The four-wheel service brakes combine hydraulic control with mechanical transmission of the type used on the model Z.

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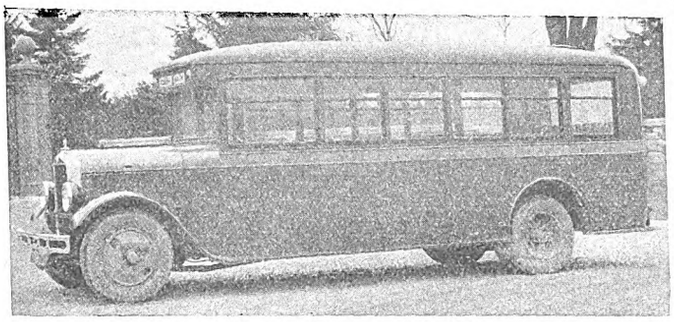
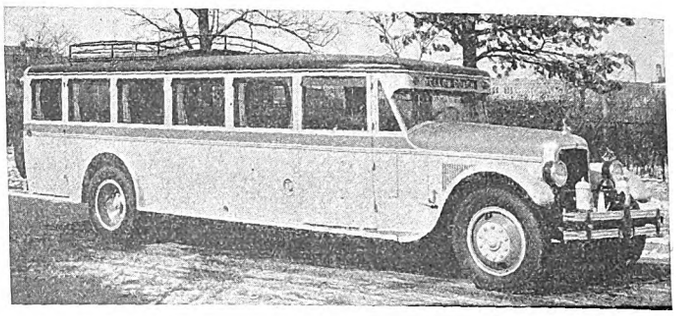


The new Yellow Type W is powered with Cadillac eight-cylinder engine



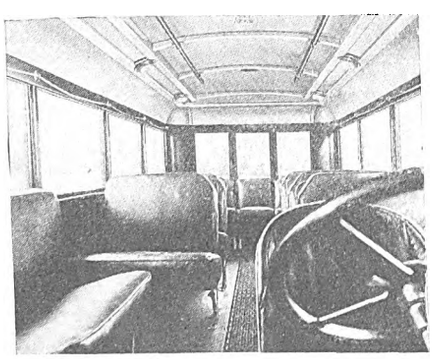
The Yellow Type Y parlor coach is provided with Westinghouse air brakes

General Motors is also exhibiting its stock model types Y, W and Z chassis, a truck with line repair body, and a cut-away sleeve valve engine.

Smaller Types of Buses Have Definite Place

Representative of the smaller capacity buses is the exhibit of Graham Brothers, the bus division of Dodge Brothers. The exhibit includes a 21-passenger street car type coach and a 21-passenger intercity bus. The seats, upholstered in genuine leather, are recessed so as to increase the knee room. Beauty has been emphasized both in general appearance of the bodies and in color schemes, the street car coach being shown in a combination of cream, maroon and gray; the intercity type in cream, brown and yellow. The heating system is of the forced circulation type. Interior illumination is provided by six flush type fixtures with 21-cp. lamps. The Graham Brothers 16-passenger coach is indicative of the trend toward a small capacity parlor car type of bus where traffic requirements are light. Inside body length is 14 ft. 7 in., width 70 in., and headroom 60 in. Four double seats are arranged on the left side of the body, four single seats on the right and four individual seats of the chair type across the rear.

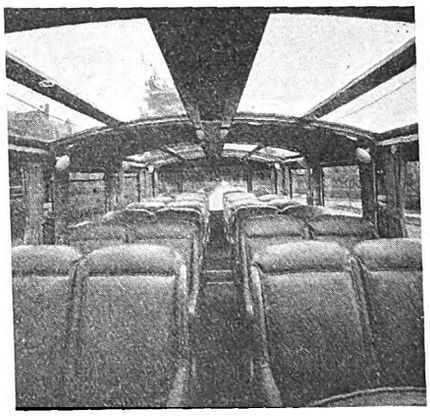
Graham Brothers have made few changes in their chassis other than to widen the forward tread 3 in. to improve the turning radius. The rear tread also has been widened slightly to permit of the use of balloon tires. Front springs have been lengthened 2 in. and the use of the three-stage progressive type of spring is continued in the rear end. The Hannum steering gear has been substituted for the type previously used, and Nichols-Lintern fan type blower heaters have replaced pipe heaters. Power is supplied by a six-cylinder heavy duty engine fitted with an 11-in. single-plate clutch and four-speed transmission. Four-wheel internal expanding hydraulic brakes are supplemented by an emergency hand brake working on the propeller shaft.



Convenient seating arrangement in Graham Brothers city type coach

Included in the Mack International Motor Company's exhibit is a bus body of rather unusual type. It is conventional in external appearance; through an ingenious arrangement the driver's seat has been placed somewhat forward of the customary position, affording a wider entrance. The body is mounted on a chassis of but 210-in. wheelbase, but provides comfortable seating room for 29 passengers. Mack is also showing a 29-passenger parlor observation car, mounted on its type AL chassis with six-cylinder 94-hp. motor. Wide plate glass windows extend across the rear, and an aluminum grille work, enclosing two spare tires, protects the rear body panels. A special type of body, built according to specifications of the Reading Railroad and intended for auxiliary service in connection with that system, has full headroom, seats 29 passengers and carries the baggage in spacious racks over the passengers' heads. Mack's exhibit also includes a 25-passenger parlor car mounted on a type AB chassis, driven by a four-cylinder engine.

No changes of a radical nature have been made in the chassis exhibited by the Mack organization, but a number of minor refinements have been incorporated in the design. A chassis for mechanical drive, mounting a standard six-cylinder 96-hp. engine, provided with four wheel BK booster brakes, and with the 26 points of rubber shock insulation indicated is shown. The company is also showing a driving line display of the four-cylinder mechanical layout, including engine, transmission, shaft brake and rear axle transmission, and a gas-electric driving line showing the arrangement of the electrical and mechanical equipment. The gas-electric assembly consists of a six-cylinder engine and a single General Electric motor and generator. Both exhibits are mounted on display stands and in motion to show driving action.



Attractive seating arrangement in a Mack observation coach

Rather unusual is a drop forging exhibit, showing the process of making a standard banjo housing, crank shaft, and connecting rod, complete from the original steel billet through to the finished product and chippings.

The FitzJohn Manufacturing Company is featuring its general utility coach, a 12-passenger parlor-car body mounted on a Reo Model FB light bus chassis of 143-in. wheelbase. This bus is designed for special parties, for express service in cities and where a larger type bus is not warranted. Body framing is hardwood, while exterior panels are of sheet steel. Exposed interior trim is in walnut, with headlining and quarter panels of textile leather. Mohair drapes at the windows are in colors to harmonize with the upholstery.

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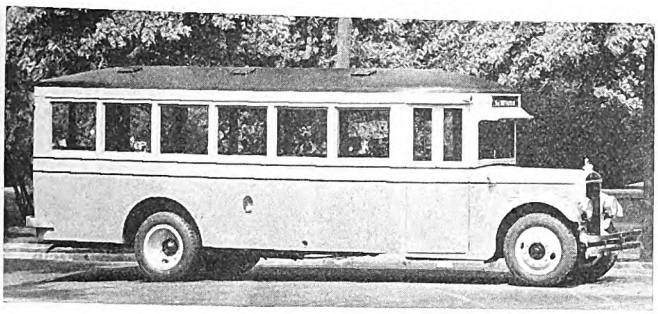
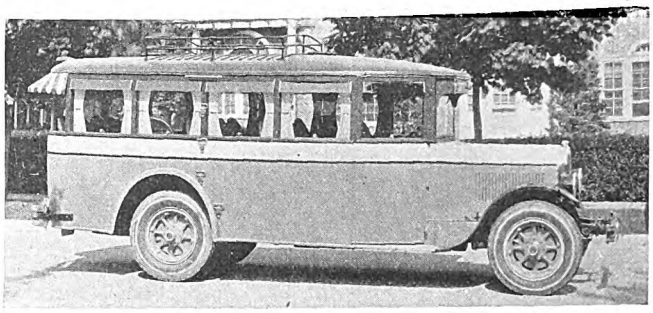


Latest Mack production is a 29-passenger close-coupled coach with 210-in. wheelbase



For light traffic routes, 12-passenger utility coach body by FitzJohn

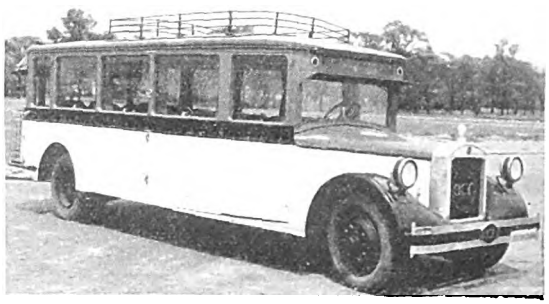
Seating arrangement provides two forward facing double chairs on the left side and two forward facing single chairs on the right. Single chairs facing the aisle are placed over the wheel housing. A built-in seat across the rear end of the body accommodates four passengers. All chairs are of wicker, upholstered in genuine leather. Baggage is stowed on the roof.

FitzJohn is also displaying a 21-passenger "pay-enter grand" coach body and a 21-passenger observation coach body, both mounted on Reo chassis of 175-in. wheelbase. In the former the interior is attractive, with good illumination, ample ventilation, a spacious aisle, full headroom and extra wide, restful seats, supplied by Hale & Kilburn. The heating system is from the exhaust through thin-walled steel tubes running along both sides of the body and covered by a perforated sheet steel guard.

In the 21-passenger FitzJohn observation coach seats are of the individual chair type of woven fibre, attractive and substantial. Backs are form-shaped and spacing allows ample knee room. Headlining is of textile leather in colors to harmonize with seats and drapes and is carried down over the quarter panels. All lower panels, which are also covered with textile leather, are made in sections so as to permit of easy removal. A luggage rack is located on the roof over the center of the car, and a nickel-plated grille protects the body panels at the rear.

The American Car & Foundry Motors Company exhibit consists of a stock model parlor observation coach seating 29 passengers, a 23-passenger parlor coach, a 29-passenger de luxe urban coach, a 27-passenger parlor coach, and a 40-passenger metropolitan coach. Here is a range of styles in body and chassis to cover practically every requirement of motor bus operation. Something new among the models is the urban coach, which was developed to meet the demand for more luxury in excess fare fast city service. Length over the bumpers is 28 ft. 6 in., over-all width 8 ft. and headroom 76 in. Paneling above the belt line is of 18-gage aluminum, die formed. Below the belt line it is of $\frac{1}{4}$-in. ply-wood, metal faced, with joints covered with aluminum molding. Panels can be replaced quickly and at little expense. Body framing is of white ash, and roof framing is steel-reinforced. The entire body is machined to template so that individual pieces may be obtained from the builder with the assurance that they will fit. Seats, supplied by Brill, are upholstered in genuine leather, Spanish finish, and are spaced on 30-in. centers, with aluminum grab handles at the aisle ends. Heating from the exhaust is distributed through seamless tubes carried along the sides of the body below the seat level and protected by metal guards.

The A.C.F. metropolitan coach was brought out to meet the demands for an automotive unit to handle mass transportation. It is shown in two models, with gas-electric and mechanical drive. The engine, of the Hall-Scott type, with gas-electric drive, is mounted on the left side near the middle of the body. There are two doors on the right side, front and rear, the latter of which is controlled by a driver's switch and treadle plate in the floor. Forty passengers can be seated in leather-upholstered seats, the majority of which face forward, and with standees loads up to 100 can be carried. Length over the bumpers is 31 ft., and over-all width 8 ft. The framing and running gear are built as a unit without separate chassis. Panels are of sheet steel. The wheelbase is 230 in. with a body overhang ahead of the front axle of 33 in. and back of the rear axle of 95 in. The metropolitan coach with mechanical drive is similar except that the engine, carried midway between axle centers, is on the right side of the coach. Mounted as a unit with the engine are the single-plate dry-disk clutch and the three-speed transmission, this later being adopted in preference to the four-speed gear box with the idea of securing faster acceleration and of minimizing gear shifting. Final drive is by under-



At left, the A.C.F. parlor observation coach does away with seats over the wheel-housing and provides dustproof compartment for baggage. At right, an A.C.F. 23-passenger parlor coach has observation section at the rear

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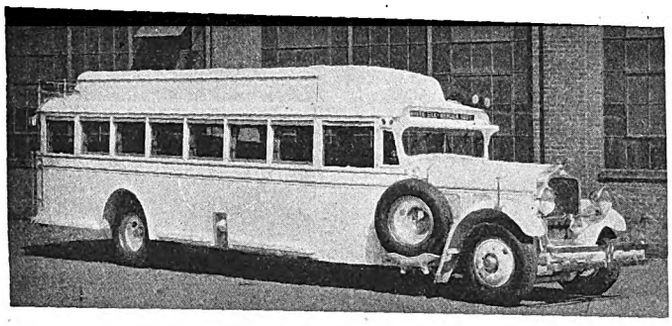
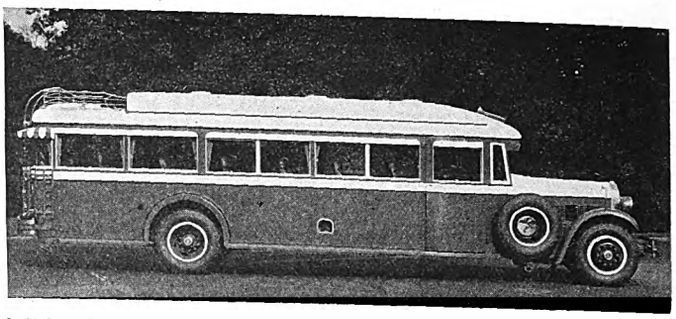




At left, White chassis, with Bender de luxe body, providing full headroom, with baggage space over passengers' heads. At right, wide windows characterize this White bus with all-steel body by Lang

slung worm to a full floating axle. The worm and wheel, which are supported by Timken roller bearings, are in line with the engine, offset to the right or left, according as mechanical or gas-electric drive is used. The I-beam front axle is of the reversed Elliott type, of drop-forged, heat-treated steel, with Timken bearings on the steering knuckle pins. The steering gear, of screw and nut type, is mounted almost directly over the front axle.

Four-wheel service air brakes supplied by Westinghouse, are of the internal expanding type with fabric-lined shoes. The engine is of the Hall-Scott six-cylinder type, 4¼x5½ in., and is rated to develop nearly 100 hp. at 1,800 r.p.m. Electrical equipment in the gas-electric model is supplied by General Electric.

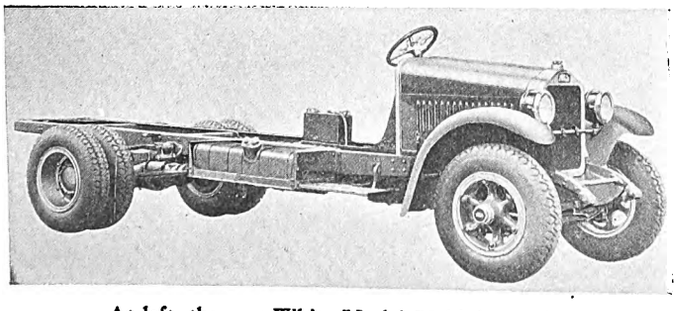
Designed originally to take care of excess baggage without resort to carrying it on the roof the raised deck feature of the parlor observation coach has been found, so its manufacturer claims, to possess a distinctive sales appeal. Wheelhouse seating is entirely avoided, a considerable proportion of the load is isolated from engine noises, and the baggage is placed at the curb level under lock and key and protected from dust. Seventeen passengers are carried in the upper compartment and twelve in the lower section, all seats, of the individual chair type, facing forward.

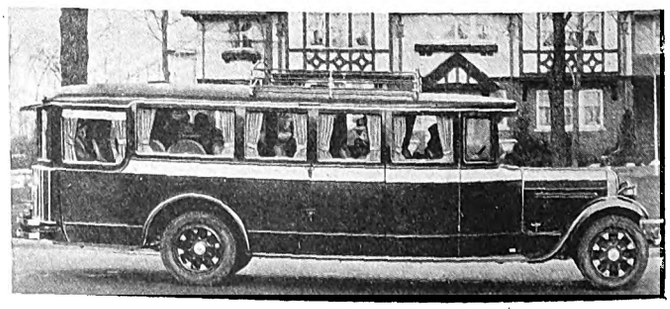
A wide range of bus models of various capacities and types, new bodies in unusual light-weight design and a high-speed, heavy-duty truck are included in the White Company exhibit. The fully-equipped models include the body work of both Bender and Lang of Cleveland. One of the features of the display is a six-cylinder, 100-hp. bus, equipped with Westinghouse four-wheel air brakes and mounted with a new type parlor car body by Bender. This bus has a wheelbase of 240 in. and seats 33 passengers. Inside overhead baggage compartments, run the full length of the body on both sides. All seats are upholstered in leather, those at the rear being reversible so as to permit of the use of card tables. A model 54 six-cylinder, 100-hp. chassis is shown stripped. The same chassis is shown with Bender "Pullman-of-the-Highway" bodies of both 25 and 36 capacities, and with a Bender 29-passenger semi de luxe "pay-enter" body. The exhibit also includes model 53 bus chassis with 21-passenger "pay-enter" body, another of the same type with a 16-20 passenger parlor observation body, a model 50-B with a Bender 29-passenger "pay-enter" body, and one of the latest Lang 29-passenger parlor coaches of all-metal construction.

The new White truck, known as model 58, has been brought out for freight or express service where high speed must be combined with large capacity. It is equipped with high pressure pneumatic tires and dual rears. Cut-away models of White motors and clutches are also shown.

Studebaker's contribution to the de luxe class is the "Seminole," a 22-passenger parlor observation car, designed for comfort and luxury. Riding comfort is assured by the use of deeply upholstered seats set at a lounging angle with ample leg room. All seats are hinged at the front for easy adjustment or removal. Side panels are padded to reduce road noises and windows are non-rattling. A body width of 90 in. and headroom of 62 in. provide seating comfort and easy access. A single-valve Kysor heater has individually controlled outlets. In the street car class this company is represented by its 21-passenger model, mounted on a 75 heavy duty chassis. Here again passenger comfort has been attained by the use of well spaced leather upholstered seats. Aisle and rear end space give room for twenty or more standees. Six dome lights against a white enamel ceiling supply illumination. For service on routes where a combination city and de luxe service must be afforded the Studebaker Company has brought out a 21-passenger unit possessing city bus convenience and parlor car luxury. The body is particularly rugged in its construction but the weight has been kept down by the extensive use of laminated wood in place of metal.

Studebaker's chassis exhibit consists of a type 75 heavy-duty bus chassis, which is used for mounting both the intercity coach de luxe and the "Seminole" type of bodies. It is equipped with the "Big Six" L-head engine, which develops 96 hp. Ease





At left, the new White Model 58 high-speed truck chassis, for freight or express service. At right, the "Seminole," a 22-passenger parlor car by Studebaker

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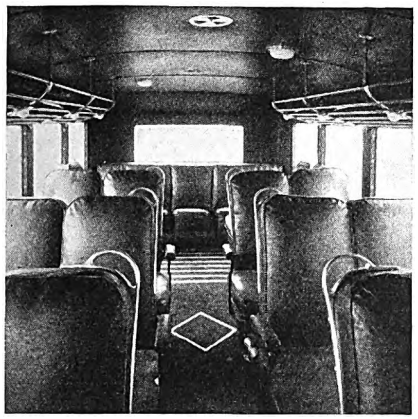


Full headroom, city bus convenience and parlor car luxury in Studebaker's 21-passenger utility coach

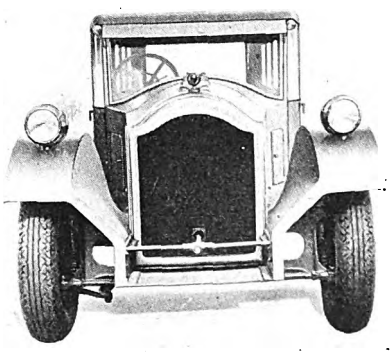
of braking action and greater driving safety are insured by the Westinghouse vacuum brakes with which all buses of this type are now provided. A fuel pump replaces the vacuum tank, its principal advantage being a positive flow of gasoline to the carburetor. Drive shafts are of molybdenum steel to a semi-floating rear axle. Additional safety is secured by a double face disk-type emergency brake mounted on the propeller shaft. A low center of gravity is obtained and the rear ramp eliminated by dropping the frame back of the wheel housing. Riding comfort is obtained by extra-heavy full balloon tires and long, resilient springs. Oversize Timken bearings were selected for the differential mountings. An extra heavy, box section, malleable housing, made in one piece, covers the differential. By removing the rear cover plate the entire mechanism is exposed for inspection or repair.

The Fremont Metal Body Company exhibits a de luxe 21-passenger, model 1,000, observation parlor car body mounted on a Studebaker 76 chassis. The special feature is the headroom of 65 in., unusually high for de luxe bodies of this capacity, permitting of the installation of interior baggage racks. Provision is also made for carrying excess baggage in enclosed containers on the roof. An effort is made to have this coach approach in appearance the high class passenger automobile, particularly as regards the design of the engine hood, cowl and windshield. Curved glass has been installed in the rear corner windows. Form-fitting chairs, upholstered in real leather, amply spaced and with unusually high backs, set off the interior to good effect.

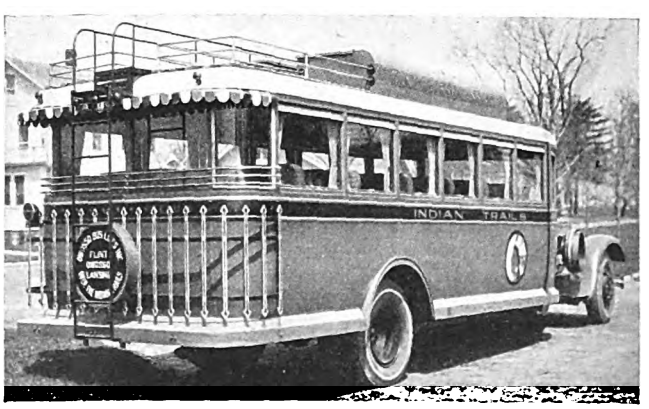
The Whitcomb Wheel Company of Kenosha, Wis., is showing a six-wheel bus with body and chassis of its own design. Chassis and body are of unit construction, carefully worked out so as to eliminate unnecessary weight without sacrifice of strength. An unusual departure from convention is the axle-less front end. This is accomplished by riveting two cast steel brackets to the side members of the frame.

The trend toward all-metal body construction is exemplified in the exhibit of the Lang Body Company. With a steel frame, aluminum panels and aluminum alloy castings wherever practicable, the body is claimed to be strong, light and durable. Its appearance is, in addition, decidedly pleasing. The body is 8 ft. in width, over all, and has interior headroom of 6 ft. 4 in. Weight is given as 6,400 lb. The entire structural strength is carried in the frame, with panels extremely light and so arranged as to be quickly and easily removed. An ornamental grille of nickel plated steel rods protects the rear. Seats are upholstered in real leather and the interior is sumptuously fitted out.

Embodying a number of distinct improvements developed or adopted during the past year Gramm Motors is showing a parlor coach and its type R-31-236-WB motor coach chassis. Interior is spacious, well lighted and well ventilated, with roomy comfortable seats. The frame is equipped with a tubular cross member mounted on brackets so as to occupy a position under the bell housing of the engine.



Axle-less front end of the Whitcomb Wheel Company's bus



Ornamental rear end and roof baggage container on a recent model, by the Fremont Metal Body Company

A Lang all-metal body with spacious interior baggage racks

The company has recently increased the size of its standard six-cylinder engine to $4\frac{1}{8}$ in. bore by $5\frac{1}{8}$ in. stroke. The length of the rear axle has been increased to $70\frac{5}{8}$ in. so as to permit of the use of larger tires. Leece-Neville electrical equipment has been made standard throughout. Bragg Kliesrath booster brakes, on all four wheels, have been adopted.

One of the most distinctive contributions to recent development in the field of automotive transportation has been the Twin Coach, produced by the Twin Coach Corporation of Kent, Ohio, and represented at the exhibit in several distinct types. The parlor car, with seats for 40 passengers, is of the type used in service between Detroit and Chicago. Being intended for high-speed service, the color scheme, consisting of a yellow lower body, white belt, green upper body and yellow roof was adopted primarily for high visibility on the highway. The interior is finished with green leather upholstery on the seats, green carpet on the floor and attractive curtains. At the left rear corner is a completely equipped lavatory 32x32 in. with a jackknife folding door concealed by a green plush curtain.

The urban coach is a standard 40-passenger Twin Coach with blue leather deep cushioned street car seats, 6 ft. 5 in. headroom and wide aisle. The trackless trolley which, in

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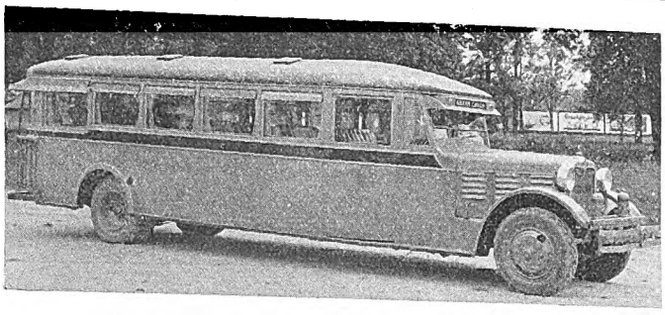
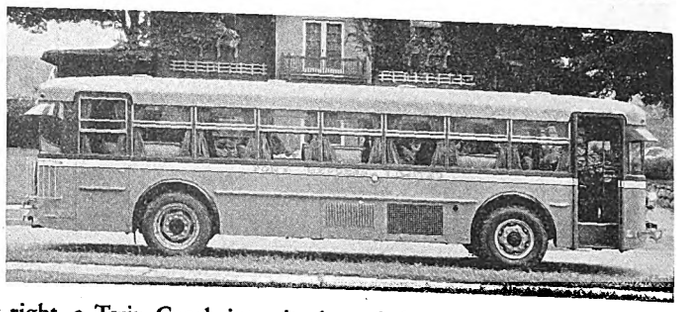




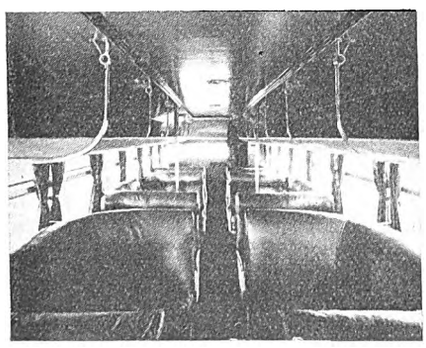
At left, Gramm's parlor car is of pleasing appearance. At right, a Twin Coach intercity bus of the type in service between Chicago and Detroit

body design, very closely resembles the urban coach, is equipped with General Electric units. Its capacity is 42 seated passengers. A feature of the structural design of the two units, the Twin Coach and the trackless trolley, is that many of the parts are identical and interchangeable.

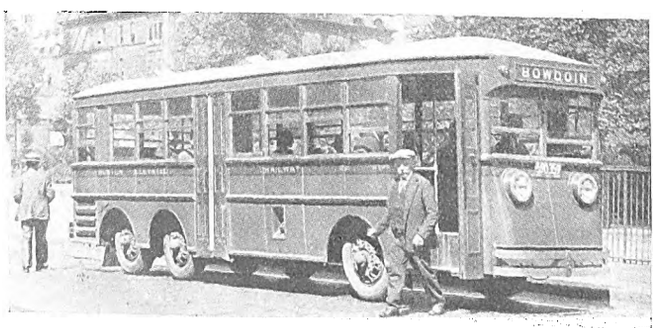
Unusual interest centers around the mechanical and structural features of the 43-passenger electric coach exhibited by the Versare Corporation. It is a duplicate of the ten recently put in service in Salt Lake City. It is driven through a double-reduction gear by two Westinghouse 50-hp. 600-volt direct-current motors. One motor is mounted in front of each of the two rear axles, being trunnion supported by longitudinal members which are part of the cross frame. Resistors are of the spiral type and so arranged as to serve for heating the car when necessary. Braking is electro-dynamic, using the propulsion motors as generators. Driver's control is through pedals. The controller pedal moves through six notches to full series position where the motion is checked for an instant, after which five additional notches carry the motors into full parallel. The other pedal controls the pneumatic brakes, which are supplied by the Westinghouse Traction Brake Company. Air compressors, made by the General Electric Company, are of sufficient capacity to supply brakes, windshield wiper, door mechanism and horn. Axles are supplied by the Eaton Axle & Spring Company. The four rear wheels are equipped with dual pneumatic tires. Trolley base, harp, poles and retriever are supplied by the Ohio Brass Company. The over-all length is 31 ft. 7 in., width 8 ft., and height from ground to roof on inflated tires, 9 ft. Owing to the extensive use of duralumin in the frame and sheathing the weight is kept down to approximately 16,000 lb. All seats are upholstered in leather, and hand straps are provided for standees. National Pneumatic apparatus is used to open and shut the doors, the front door being handled by the driver and the center door equipped with automatic treadle plate.

The Versare exhibit includes a gas-electric coach, complete'y equipped, a skeleton gas-electric coach cut away so as to show structural and operating detai's, and a complete 36-passenger electric coach introducing the new Versare type of opposed motor drive.

The Fraser Electric Transmission Corporation is showing one of its electro-control units for bus drive. This is a complete motor-generator, with two armatures rotating in one magnetic field. The control of speed is through variations in the armature connections and the field strength. This single unit is designed to do the same work as the generator and motors of the familiar gas-electric drive. Besides the unit various component parts are shown. Another complete unit is shown installed for operation on a 29-passenger city-type bus.



Interior view of Twin Coach, showing seating arrangement and baggage racks



Versare gas-electric coach for city service

First-Aid Equipment Shown

TREATMENT of injuries with Mercurochrome is featured in the exhibit of Hynson, Westcott & Dunning. Mercurochrome is a germicide and is employed in treating and preventing practically all types of infections. Due to the fact that it does not irritate workers report minor injuries more readily, as they learn that the applicaion of this does not hurt and that the treatment of the injury is not more painful than the injury itself.

Interesting Exhibit for Purchasing Agents

PURCHASING agents and storekeepers should not fail to visit the interesting exhibit of the Purchases and Stores Division of the American Electric Railway Engineering Association. This exhibit, located in the north wing of the exhibition hall, includes a delineascope, which shows views of modern stores equipment and material-handling devices. Escalators, chutes, cranes, magnets, and lift trucks are shown in operation in 34 different utilities in this country, Canada and Mexico. Views of stores buildings and stores layouts are shown from utilities in 21 different states.

In addition, there are displayed various sets of forms as recommended in the Manual and a complete exhibit of forms and methods of storage accounting. W. V. Shoemaker, chief stores accountant of the Philadelphia company and subsidiary companies, Pittsburgh, Pa., is present at the exhibit to answer questions and explain the procedure.

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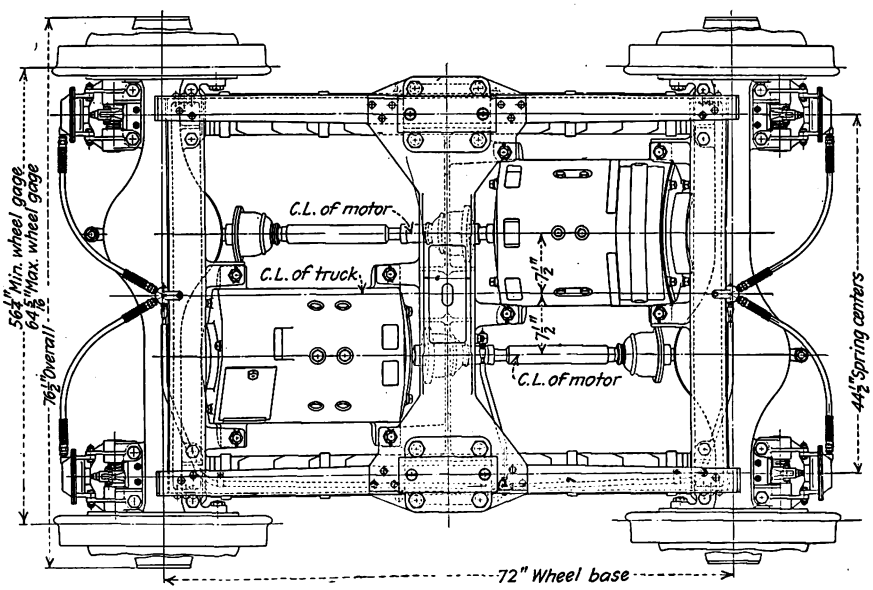
CAR TRUCKS DISPLAYED
Show Progress During Year

Several entirely new designs of trucks and truck parts being shown at the exhibit. Many standard pieces of equipment on display have been improved

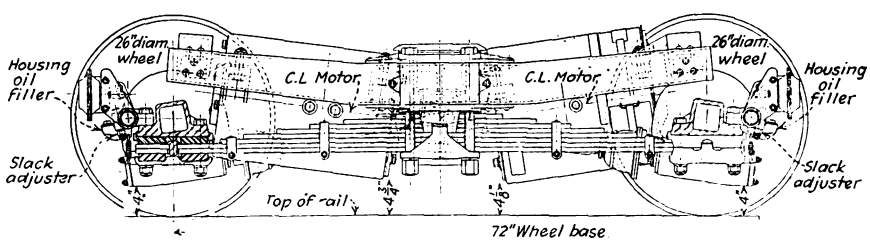
CAR truck manufacturers in the past year have developed several new designs, representing distinct departures from conventional practice or changes on standard models in this important field. At least six new truck models have made their appearance, and in addition many pieces of truck equipment have been improved. Last year the truck manufacturers introduced to the industry the small diameter wheel trucks with high-speed motors, automotive-type worm and double reduction gear drives, and new spring arrangements. Most of these designs also included roller or ball bearings.

This year there are further refinements in some of last year's new models and some entirely new designs. Introduction of cars mounted on four wheels by the Twin Coach Corporation and the St. Louis Car Company will attract particular attention because of the unusual methods adopted for achieving riding ease and ability to negotiate sharp curves. Among the important new trucks and improved models being shown are the model 51 Timken-Detroit Axle Company truck, with the new 64011-W worm drive axle, the equalized pedestal type truck of the Baldwin Locomotive Works, trucks developed by the Cincinnati Car Company for its high-speed interurban and city type cars and the trucks of the Osgood Bradley Car Company.

In truck parts there are likewise many new products and improvements of former equipment. Westinghouse has an improved W-N double reduction gear drive; the Tool Steel Gear & Pinion Company has a quiet, single reduction gear drive, and Nuttall is showing a noiseless gear. Brill exhibits a redesigned mechanical slack adjuster, and the Anderson Brake Adjuster Company has a "non-vibrating" slack adjuster. Standard Steel Works Company has developed a light-weight rolled steel wheel with a noise-deadening feature. The Manganese Steel Forge Company is showing its precision finished pins and bushings for truck parts, and several other manufacturers of similar equipment are represented with their latest products.



Model 51 Timken-Detroit Axle Company truck, which supersedes the model 50 exhibited last year



Side elevation of the model 51 truck, showing the unusual spring arrangement

The Timken-Detroit Axle Company's new model 51 truck supersedes the model 50 exhibited at the 1927 convention. The new truck is equipped with a 64011-W worm drive axle which supersedes the 64010-W axle. Last year's model 50 truck, which introduced the idea of worm drive axles, diaphragm brakes, internal expanding brake shoes and automotive type springs for street cars, and which included the introduction of spring suspended, light-weight, high-speed motors, was a radical departure in car truck practice. It was introduced frankly as an experiment with the objectives of reduced noise and weight, and improved riding in view. The model 51 is the result of a year's study of the earlier truck in service on a number of electric railway properties.

The model 51 differs from the previous design essentially in the arrangement of springs and the truck frame. The side frames of the first model were curved over the axles and joined at the ends to form a complete frame carrying the axles. In the 51 truck the axle housings and springs really form the truck frame. A simple structural cradle carried over and

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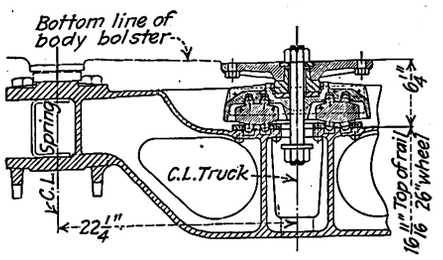


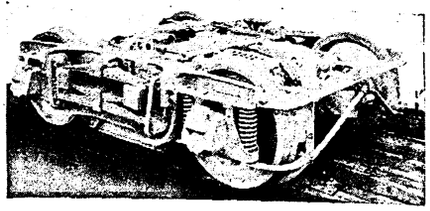
Center plate for the new Timken-Detroit Axle Company truck

inside the half-elliptic side springs merely serves as a support and mounting for the motors. Instead of having two short half-elliptic springs mounted on a truck frame, as in the model 50, the new design provides simply one long half-elliptic spring on each side, from axle to axle. The spring ends are bolted to the axle housings and support the motor cradle and trunk bolster at the center. The axle and worm drive used with the new truck have been designed for heavier loads. Also, the brake diaphragms are mounted differently and the entire brake mechanism has been redesigned.

Trucks included in the Cincinnati Car Company exhibit represent two distinct types, one designed for high-speed interurban service and the other for city operation. Ease of riding and safety at high speed were the principal objectives sought in the first, while simplicity, ruggedness and low maintenance were primary considerations in the latter. The interurban trucks have cast steel side frames, spring pedestal journal boxes, and combination full and semi-elliptic spring bolster suspension. In addition to the regular air brakes, the trucks carry Cincinnati duplex air-magnetic track brakes. The unusual spring arrangement and the magnetic track brakes are the two outstanding features of this design. The rail brakes can be used either for emergency or service operation. The shoes are spring supported approximately 2 in. above the rail on each truck side frame and are lowered into magnetic contact with the rails by a simple pneumatic mechanism and operated from the motorman's position by the sand control on the standard M-28 type of brake valve. By this arrangement the track brake is automatically brought into operation whenever an emergency application of the air brakes is made through the Safety Car Devices equipment.

The four electric shoe brakes on a double truck installation are connected in series-parallel from the trolley, the two shoes on each truck being connected in series. Full saturation of a shoe is reached with approximately 45 amp. at half line voltage, giving an attractive force between the rail and shoe of approximately 4,800 lb. This equipment was developed jointly by the Cincinnati Car Company and General Electric Company.

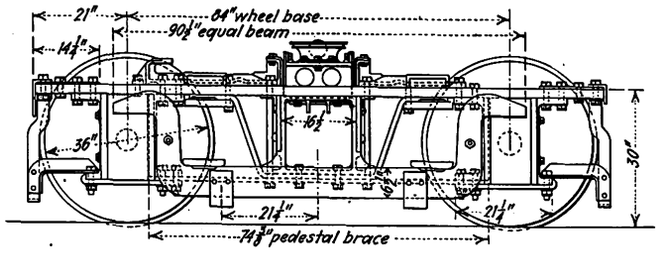
In the field of heavy, high-speed trucks, many unusual features are presented by the truck developed by



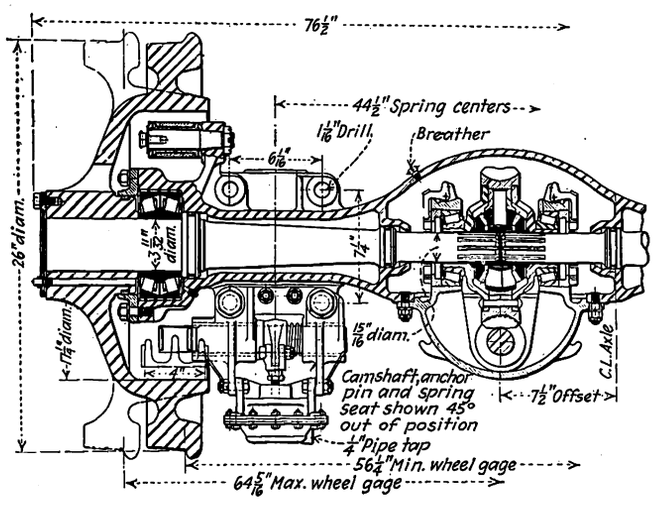
Cincinnati Car Company truck under the Indianapolis & Southeastern Railway interurban car, equipped with duplex air-magnetic rail brakes

the Baldwin Locomotive Works for the Chicago, South Shore & South Bend Railway. This is of the equalized pedestal type with heavy angle end frames. The side frames are forged steel and are secured to the end frames by corner gussets, and to the steel slab transoms by heavy cast steel gussets. They also support the clasp brake rigging in which special attention is given to the suspension to prevent chatter. The bolsters are case hardened with castellated nuts and cotter pins.

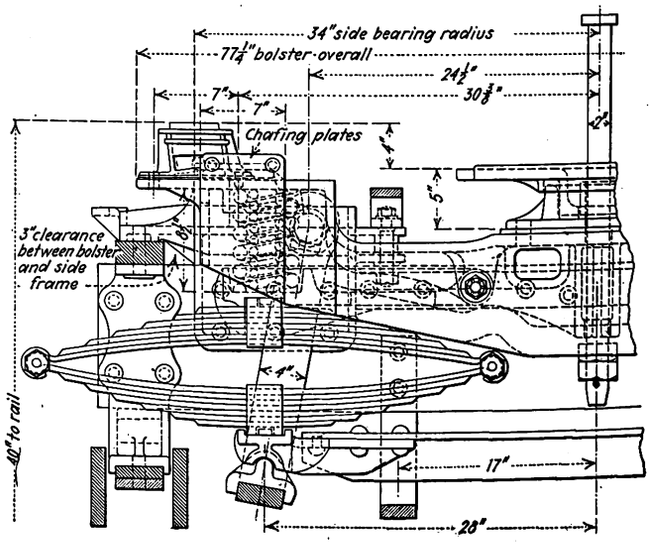
The spring arrangement is especially noteworthy. The bolster is supported on auxiliary coil springs located above the full elliptic springs, and carried in a cast steel spring housing attached by a fulcrum bolt to the bolster. The equalizing beams are



Side elevation of the equalized pedestal type truck of the Baldwin Locomotive Works for use under heavy, high-speed interurban passenger cars



Timken-Detroit Axle Company's new worm drive axle, the 64011-W type



Detail of the bolster and swing link of the new Baldwin truck

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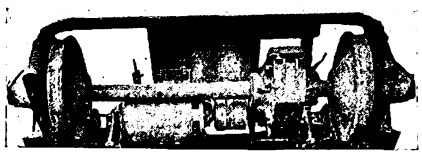
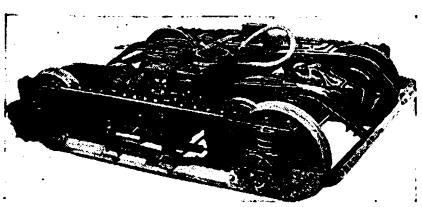
die punched from steel plates, and are equipped with separators to prevent chafing of the pedestals. They are designed with easy curves and support the frames through high helical springs of large diameter, considered essential in absorbing rail shocks due to low joints, etc. Each side of the swing links supporting the bolster and elliptic springs from the truck frame is hung from pins carried in sockets in the frame gusset plates. The design permits a comparatively low car height for high-speed service.

The Osgood Bradley type 45-66 KDA 35 trucks under this company's exhibit car are equipped with Westinghouse-Nuttall double reduction drive, and high-speed, full spring mounted motors. They are the truss frame, spring pedestal type, with coiled springs over the Hyatt roller



Single reduction gear drive for high-speed, spring suspended motors, developed by the Tool Steel Gear & Pinion Company



Osgood Bradley's type 45-66 KDA 35 truck is equipped with Westinghouse-Nuttall double reduction drive, high-speed, full spring mounted motors and brake diaphragms

bearing journal boxes, and with conventional double elliptic, spring supported, swing type bolsters with damper attachment. The brakes are of the conventional type, but are actuated by diaphragm brake chambers, one being installed for each wheel. With this design much of the body brake rigging is eliminated and the total weight of all brake equipment is much less than with the old type. The trucks of the Osgood Bradley sample car were described in the June 23, 1928, issue.

A new single reduction driving unit for use with high-speed motors has been developed by the Tool Steel Gear & Pinion Company and is shown on one of the Cincinnati cars at the exhibit. This drive was developed especially for the light-weight, high-speed motor, and is simple and rugged. In this design the motor is connected to the reduction unit by a flexible coupling arranged to give sufficient flexibility to care for any reasonable wear or looseness in the journal boxes, or end play in the axle, or angularity of the axle due to unequally proportioned load on the truck springs. The unit itself consists of a gear and pinion carried on SKF roller bearings and operating with continual lubrication. The housing is oil and dust-tight and is split longitudinally so that if necessary the lower half can be dropped for inspection. The gear unit is mounted upon the axle with a swing link suspension directly over the pinion. This suspension arrangement keeps the unit and the motor in alignment.

The W-N drive, introduced to the industry last year, was designed for high-speed motors. It is a double reduction, self-contained gear unit, with fixed gear center distances maintained by Timken bearings. The gears operate entirely in a bath of oil in a one-piece case.

A new feature of the W-N drive is the Westinghouse-Nuttall noiseless gear. These gears are being shown in both the Westinghouse exhibit and the R. D. Nuttall Company exhibit.

In addition to its reducing unit the Tool Steel Gear & Pinion Company is also showing the new quiet gear it has developed. A dovetail groove in the blank, filled with lead, has proved effective in deadening the ringing noise of the gear.

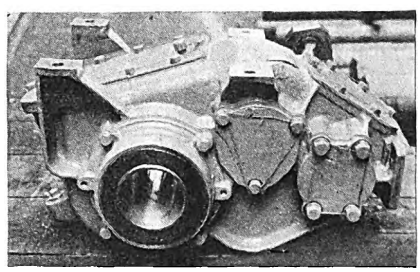
Other manufacturers exhibiting gears and gear cases or other drive parts are the General Electric Company, the National Railway Appliance Company, the Electric Service Supplies Company and the Chillingworth Manufacturing Company.

The J. G. Brill Company is showing at the convention its redesigned mechanical slack adjuster. It was redesigned to facilitate the installation of new brakeshoes, eliminating a large amount of labor and obviating the necessity of removing bolts or pins for the reinstallation of shoes.

The Anderson Brake Adjuster Company has a working exhibit of its latest type of non-vibrating slack adjuster and other types manufactured. The new non-vibrating type is particularly suited for beamless brake rigging.

Among the other manufacturers of brake equipment represented at the convention are the Westinghouse Traction Brake Company, which is showing an operative exhibit of the variable load brake, the American Brake Materials Corporation, the Safety Car Devices Company, the Wheel Truing Brake Shoe Company, the Railway Materials Corporation, the American Brake Shoe & Foundry Company and the National Railway Appliance Company.

Among the manufacturers exhibiting car wheels are the Standard Steel Works Company, the Association of Manufacturers of Chilled Car Wheels, the National Malleable & Steel Castings Company, the Griffin Wheel Company and the Bethlehem Steel Company. The Standard Steel Works Company is showing a 26-in. special light-weight, rolled-steel wheel with deadening features, as used by the Delaware Electric Power Company on the new cars being built by the J. G. Brill Company. The Association of Manufacturers of Chilled Car Wheels has on display one of its



The W-N drive with double reduction gears for use with high-speed, full spring mounted motors

Brill mechanical slack adjuster, redesigned to facilitate reinstallation of brake shoes

new single plate chilled tread wheels with reinforced flange. The rim and apex of the flange of this type wheel have been covered with chiller to give an improved composition of grain structure. The Griffin Wheel Company is showing wheels with chilled rims and back flanges.

Manufacturers of roller and ball bearings, journal boxes, chafing plates, pins and other truck parts, have interesting exhibits. Among these are the Manganese Steel Forge Company, the Timken Roller Bearing Company, the Hyatt Roller Bearing Company, A. Gilbert & Sons Brass Foundry Company, the Ahlberg Bearing Company and the Norma-Hoffman Bearings Corporation. The Manganese Steel Forge Company is featuring its precision finished pins and bushings for brake gear and other parts made of manganese steel.

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Interesting Developments in Methods and Devices for

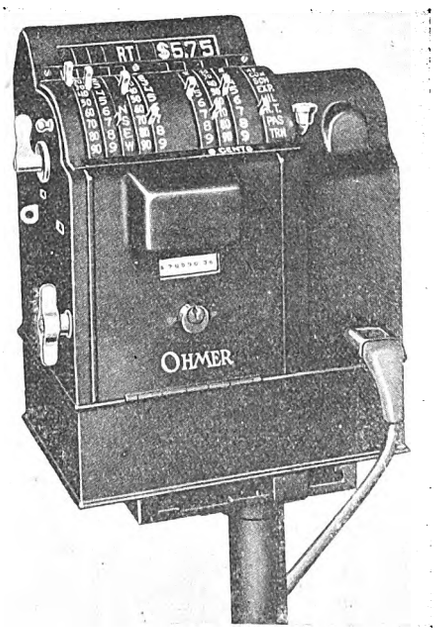
FARE COLLECTION

Many new features, especially in ticket issuing machines, are being shown at the Convention. The manufacturers of apparatus of this kind are well represented

VITAL as it is in street railway and bus operation, fare collection is signalized at the convention by an especially interesting exhibit of apparatus placed on the market for that purpose by various makers. Practically all of them manufacture equipment for both railway cars and buses, though the apparatus often differs somewhat according to the class of service for which it is intended. Some manufacturers also build a third variety of equipment for station use.

Perhaps the most novel features at this convention in apparatus for fare collection and registration are the ticket printing and issuing machines of the Ohmer Fare Register Company and the National Cash Register Company, both of Dayton, Ohio. The Ohmer machine for use on cars and buses is known as the Ohmer ticket printing register, type 80. It is so small that when it is placed on an ordinary sheet of writing paper there will be a margin of paper all around the register. It stands less than 1 ft. high and weighs only 30 lb. At the same time it is said to be so rugged and simple in construction as to be thoroughly capable of standing the rough usage to which an instrument of this kind must be subjected. There is an untamperable mechanical tie-up between the amount which is indicated to the passenger when the fare is paid, that on the ticket issued to the passenger, and that printed on the strip which goes to the auditor. The amount and class of fare are indicated at the top of the register, both at the front and at the rear, so that they can be checked by anyone else in the car or bus. The management's printed slip has these figures and also the number of the operator, the trip in or out, the date, the zone and the class of fare paid with totals in different colored inks, from time to time.

Another feature of this register is the ease with which it can be used. Where several fares of the same kind are paid consecutively, they can be recorded simply by repeated pressure on the operating button. Where the amount and class of fare to be registered are changed, quick setting of



The new type 80 Ohmer Ticket Printing Register for use on buses or cars issues its ticket at the side and is electrically or hand operated. It weighs only 30 lb.

one or more levers is necessary, but they can be set by the sense of touch alone.

A number of outstanding mechanical features are incorporated in the design. They include an ink roll capable of printing as many as 200,000 tickets, a self-sharpening knife without springs for cutting off the printed tickets, an arrangement for printing simultaneously the tickets and the records, a simple device for taking up the slack in the paper, etc. Type 80 register is manufactured for use with either hand or motive power.

In addition, the same company has a large number of well-known devices of other types, and also a ticket printing machine, which issues a complete standard-size cardboard railroad ticket on demand, with names of stations, date, etc., and with complete records of all tickets issued for auditing purposes. It is known in this country as the Ohmer Ticket Office Ticket Printer Type No. 232. Abroad it is put on the market by the Allgemeine Elektricitäts Gesellschaft and is widely used. The ticket issuing machines of the London Underground Railways, of which particulars were given on page 579 of the issue of this paper for April 7, 1928, are of this type.

Another ticket printing and issuing machine has just been placed on the market by the National Cash Register Company of Dayton, after extended tests in practical use on several motor coach and street railway lines, and is being shown. When a fare is registered a ticket automatically is printed and issued. The information on the ticket includes date, ticket number, "from" station, "to" station, amount of fare, kind of fare, operator's number, number of register, name of company, and instructions to passengers. Each one of these elements is also printed on a "trip sheet" within the register for auditing purposes. When a ticket is issued there is a plain indication of all details, visible to both passenger and operator. The register weighs about 90 lb. and is finished in dull black enamel.

In the field of fare boxes and registers this year, a new design being

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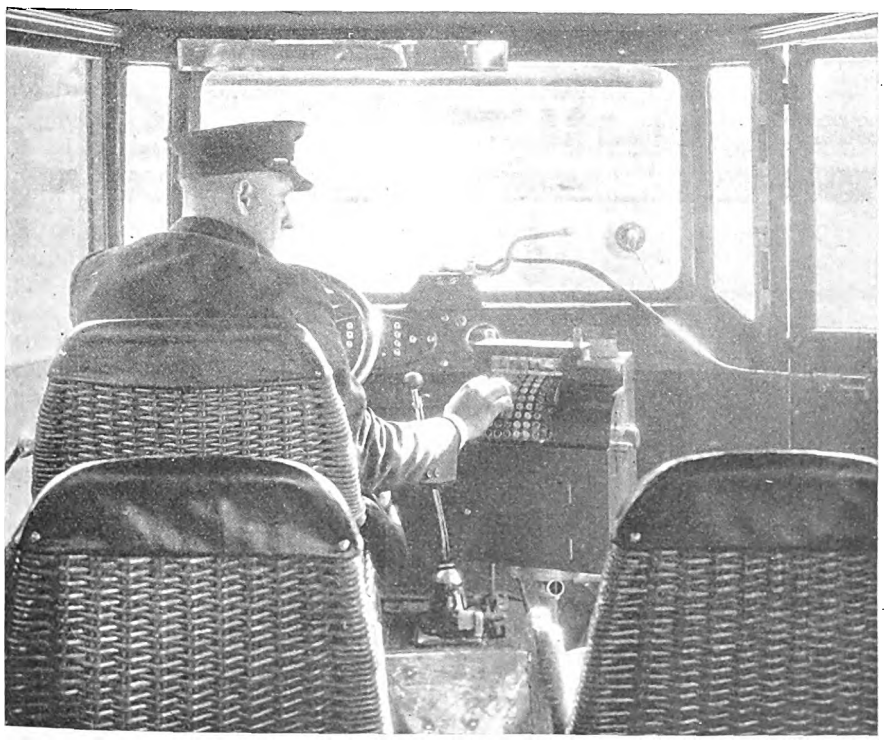
Type 80 Ohmer Ticket Printing Register in use

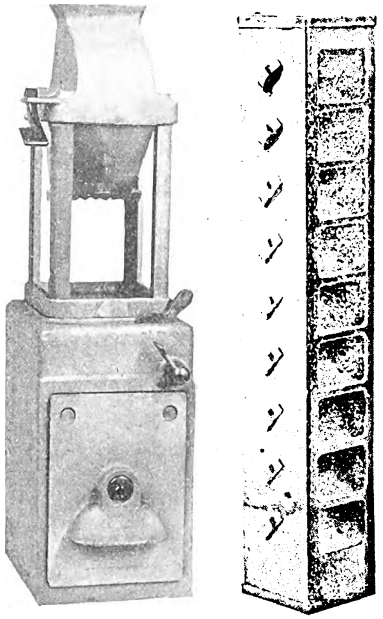
shown at Cleveland is the safety fare box of the Bell Register, Inc., Springfield, Mass. This box is manufactured by Smith & Wesson, Inc., of the same city and is being shown in the booths of the National Railway Appliance Company. It is able to take all kinds of fares; paper, tokens or coins. After falling on an inspection plate these fares are dropped into a locked drawer which cannot be removed while any coins are on the inspection plate. When the drawer is removed by the inspector it locks itself with a sliding cover, to open which a second key is needed. Features of this box stressed by the manufacturers are its small size and lightness and the speed with which fares collected can be cashed in. Another new fare device shown by the same exhibitors is apparatus for accounting for the number of passengers carried from zone to zone, the amounts paid and every fare transaction taking place on the trip. It is easily understood by passengers and operators alike and is particularly adapted to long bus routes. Both of these devices have proved satisfactory in trial use.

The International Register Company of Chicago is showing its latest types of electrically and manually operated registers, including in the former class a register brought out last year which can be operated by the foot, thus speeding up the handling of passengers and fares on a one-man car. The "cutawl," though not a fare collection or registering device, is mentioned here because it is also on exhibit in the booth of the same company.

Money-Meters, Inc., of Detroit, successor to Rooke Automatic Register Company, has a full line of its automatic registers, which permit instantaneous audit by the passenger, of nickels, dimes, quarters, half dollars and metal tokens, or any of these in various combinations. The models are portable or stationary in form and may be operated manually or by electricity.



The new National Fare Recording Register issues a complete ticket and can be operated by one hand



Aluminum fare box with locked drawer and apparatus for issuing and accounting for zone tickets, of Bell Register, Inc.

The principal new feature in the exhibit of the Johnson Fare Box Company is its electrically operated nickel-dime-quarter box, adapted for either one-man cars or one-man buses over a series of zones where the rate of fare is 5 cents per zone or 10 cents per zone. The box will automatically record the fares on the overhead register, giving a visible and audible registration of all fares deposited, thus minimizing the duties of the operator. With this type of box a company may put in either the pay-as-you-enter system to destination with an identification check, or the pay-as-you-leave system, as recommended by the A.E.R.A. fare collection committee in 1927. The company's exhibit also includes Universal change carriers, hand operated fare boxes for odd fares, electrically operated fare boxes for 5 and 10 cent fares, and electrically operated fare boxes for 10 cent fares and tokens.

In the field of inclosed fare boxes, the Cleveland Fare Box Company and its associated Canadian company of the same name are emphasizing particularly a new fare box of its well-known type, which has been brought out for bus operation, designed so as to resist the rattle and wear which naturally comes from engine vibration. The Cleveland company is showing also its double lock fare boxes for urban, suburban, and inter-

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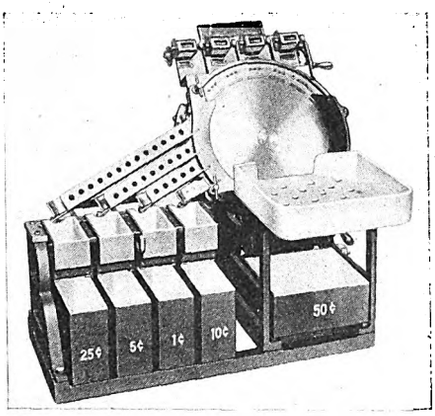
urban cars and buses, its zone check boxes used as an aid to collecting suburban and interurban fares, and its change carriers, both lever and "slip" operated.

Associated with the Cleveland Fare Box Company are also, of course, the Canadian Cleveland Fare Box Company, the Four-Way Lock Company, the C. L. Downey Company and the James H. Matthews Company. The Four-Way Lock Company specializes



Downey sorting machine in operation

in padlocks, cylinders, night latches, drawer locks, and chest locks, all of the four-way type. A full line of all are being shown at Cleveland. The C. L. Downey Company's exhibit relates to improved machines for separating, counting, wrapping and bagging coins. This display includes what is said to be the only machine which has the mechanical principle of forced separation, and positive count. The four associated companies mentioned with James H. Matthews & Company, whose exhibit will be mentioned later, have in operation a miniature counting room to demonstrate the efficiency and application of these machines to all operative conditions. A view is given of the Downey company's counting machine on exhibition.

The Sattley Company, Detroit, Mich., will have an extensive exhibit of coin counting, coin sorting and coin wrapping machines, as well as coin wrappers.

Zone Check Receipts

MacDonald Manufacturing Company, Cleveland, shows a full line of its cash receipt, zone check and transfer holders. Its cash receipt holder is manufactured in four lengths, 5 in., 6 in., 7 in. and 8 in., and is arranged so that it can be attached to the steering post column when used on a bus or to 1¼-in. tubing when used on one-man cars. This permits operators to issue receipts with one hand, leaving the other free for the guidance of the car.

It will be remembered that the holder, with an accompanying pad of tickets, permits the issue of the proper ticket or receipt, marked on both ticket and stub to indicate "in" or "out" trip, kind of fare paid, and station on and off.

The company's zone check holder is a modification of its cash receipt holder. It is made in three sizes, to contain six, nine, or twelve pads. The ticket, when issued, indicates the zone of origin and the amount of fare paid. Opposite each pad is a key lever which can be pressed quickly, thus filing the auditor's stub into the holder and out of the way of the next succeeding ticket. Like the fare receipt holder, the zone check holder can be attached to the steering post column of a bus or to a post on a car, or it can be attached to any ordinary fare box, thus permitting operators to issue destination checks as the fares are paid. Like the fare receipt holder it is made of monel metal and stainless steel.

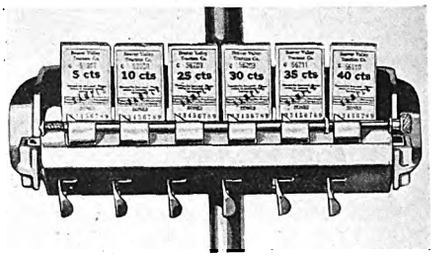
Other Means for Collecting Fares

Fares may be collected and registered, particularly at subway and elevated stations and at pre-payment and post payment areas for buses and street railways, by coin controlled turnstiles. The Perey Manufacturing Company, New York, is showing several patterns of such turnstiles this year. The latest model is arranged for two-way operation, *i.e.*, paid entrance and free exit. One shown at the booth is arranged to be released with nickels and the other with dimes. Other types are arranged to release when operated by a cashier or ticket taker. The same company is also showing, for trolley cars and buses, an electrically operated coin box and overhead register combination with instantaneous visible and automatic registration.

Two alternatives are possible when a passenger does not pay his fare by cash. One is to pay by ticket, as when he presents a transfer. The other is to pay by token.

The products of the Globe Ticket Company, Philadelphia, Pa., are well represented by samples of new transfers recently installed in Akron, Johnstown and Toledo, which are practically punchless. The company also has samples of the interesting Buffalo transfer, of which an account and reproductions were published in the issue of this paper for March 3, 1928. It also has on exhibition a full line of ticket books, cash fare receipts, and tickets.

James H. Matthews & Company, Pittsburgh, are exhibiting an extensive line of metal fare tokens, allocated and unallocated, illustrating a variety of designs, ideas, sizes and metals. The exhibit includes as well, metal dies for making tokens, indicating the accuracy of manufacture and difficulty of counterfeiting. In connection with its associated companies, the Cleveland Fare Box Company, the Canadian Cleveland Fare Box Company, Ltd., and the C. L. Downey Company, it has a miniature counting room in operation. In addition to the exhibits along the fare token line, the company also is showing bronze safety trophies and medals as made for a number of electric railways.



The MacDonald zone check holder can be operated with one hand and is made in several sizes to accommodate as many as twelve ticket pads

Lighting Exhibit at A.E.R.A. Convention

SUPPLEMENTING its 1928 report, rolling stock special committee No. 4 has made a study of lighting, and will have an educational exhibit on electric railway lighting in the basement of the auditorium at the annual convention in Cleveland. A number of lighting equipment and lamp manufacturers will loan such material as car and industrial lighting reflectors, appropriate incandescent lamps, and illustrations of their recommended application. Most of the equipment mentioned in the 1928 report will be displayed for examination and discussion.

The interest evinced by visiting operators in the committee's car lighting exhibition last year indicated that this subject was of considerable importance to them. As the committee's 1928 report also includes recommendations on shop, office and yard lighting, the application of suitable equipment for lighting properties will be stressed particularly.

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New Ideas Brought Out in

MOTORS and CONTROL

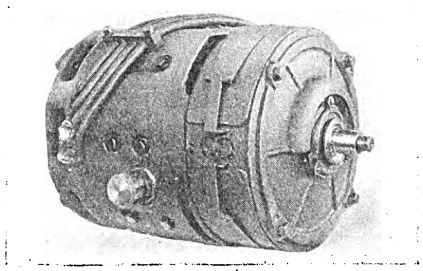
Light-weight motors, both for standard suspension and for the double-reduction and worm-gear drives, are brought out. Progress also is shown in control devices and safety car control

STARTLING changes are rare in the electrical equipment of cars. However, the visitor at the exhibit this year cannot fail to note that despite the standardization in that line the leading manufacturers have within the past year brought out a number of greatly improved motors and controllers. When the new drives with high-reduction gearing, either spur or worm, were brought out a little more than a year ago, it was necessary to adapt motors to railway service from the automotive field. Within the year both large manufacturers have brought out new motors specially designed for the service.

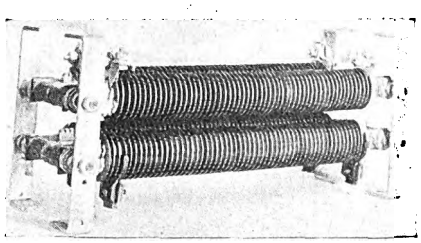
The Westinghouse Electric & Manufacturing Company is featuring several railway motors embodying its latest developments. Two high-speed motors, types 1425 and 1426, respectively 35 and 50 hp., were designed primarily for use with the W-N drive which was exhibited last year on several of the new cars. These motors are wound for 300 volts each, and are placed two in series for use on a standard 600-volt circuit. Both motors are arranged for complete spring suspension, either with the W-N drive or the worm drive.

The latest standard motor shown by the Westinghouse company is the 510-E, which incorporates all the features of vital importance such as dual ventilation, oil seal lubrication, heat-treated ally shaft and bolts, forged steel fan, and open rear end. Particular attention has been given to the construction back of the commutator to prevent breakage of leads. The 535-A, 60-hp., 600-volt motor, also in the exhibit, is particularly suitable for low-floor suburban and interurban cars with 26-in. wheels. It has the open rear end, permitting ventilation at that point, interchangeable brush-holders, cast-steel fan and other modern elements.

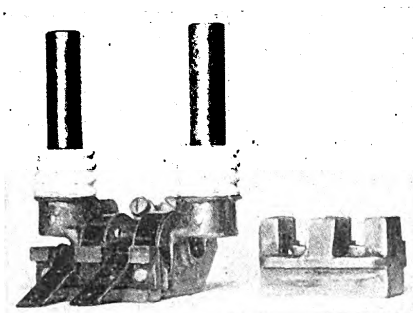
In control equipment the UP-32 unit switch is a new design for heavy duty service. It is a complete unit with switch mechanism, operating cylinder, valve magnet and blowout details assembled together, ready for installation in a switchbox or in a cabinet. The cylinder forms the support for all details of the switch unit, which in turn supports the switch when mounted.



The Westinghouse 1426 motor, designed for high-speed drive with double reduction or work gearing



Type M resistor of Westinghouse Electric & Manufacturing Company, wound of high-resistance strip set on edge



The detachable box brush-holder, a recent improvement put out by Westinghouse

Types 806-J-7 and UM-2-H line switches, the first one electro-pneumatic and the second magnetic, are for use in conjunction with K control. The first has the same design feature as Westinghouse HL control, and is arranged for cabinet or underfloor mounting. The UM-2-H switch has greater current-carrying capacity and arc rupturing capacity, but is lighter in weight than previous types. The TA handle switch, also on exhibit, has been used in conjunction with various new and old types of K control. By utilizing lost motion the line switch, instead of the finger on the main drum of the controller, takes the heavy arcing. The type TC-102 control switch is a simplified, inexpensive switch for high-voltage circuits of either K or multiple-unit control equipments.

The type M resistor is an assembly of individual units of alloy ribbon wound edgewise on porcelain insulator tubes. It is recommended by the company for use on all modern cars. For heater type resistors the type 197-J control resistor has been developed. Its fundamental features are well established, having remained virtually the same for eighteen years.

Renewal parts are also being made a feature in the Westinghouse exhibit. These are being shown as a means of improving the operation and reducing the maintenance cost for older types of apparatus. They include a compensating finger designed to overcome the deficiencies of the old standard flat bronze fingers on K controllers. The action is indicated by an enlarged working model to show the self-aligning and automatic adjusting features of this improved type. The twin washer brush-holder finger has been reproduced three times normal size to show the principle of the mechanism that has become standard for brush-holders on new motors. A heat-treated armature shaft, commutators, armature coils and armature bearings are shown

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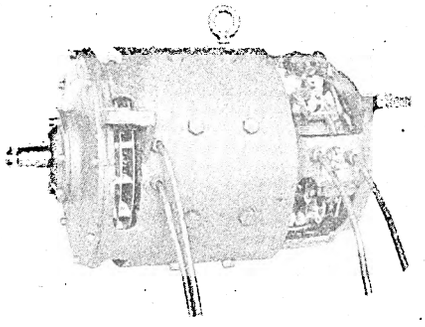
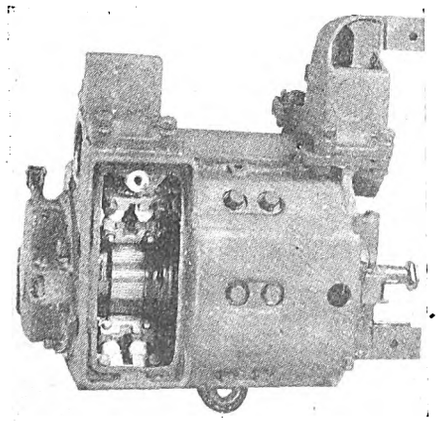
with descriptive signs calling attention to the improvements. New types of reverser fingers shown are designed to increase the capacity of reversers by reducing the heating. The detachable brush-holder box can be removed and replaced without disturbing the remainder of the brush-holder mechanism.

Several new types of railway motors are featured in the General Electric Company's display. The GE-265-F motor incorporates the new constant oil level bearings, brush-holders located on the bottom of the motor for pit inspection of brushes, ventilation through the top commutator cover and field coils with connecting cables permanently attached. This is now the company's standard 35-hp., 600-volt motor. It weighs 1,415 lb. Included with it are a partially wound armature, a complete set of armature coils and insulation and a light-weight malleable iron gear cover of rugged construction.



The GE-1126 automotive-type railway motor, for use with the recent drives



The GE 265-F railway motor has the brush-holders below to facilitate inspection from the pit

The GE-298 motor, rated at 50 hp. at 600 volts, was developed for trolley bus, double reduction or other special drives. It weighs 870 lb. The bearings are of an anti-friction type, one being balls and the other rollers.

There also is an exhibit of the GE-1126 motor and D-201 gear reduction. The motor, rated 35 hp. at 600 volts, weighs 483 lb., while the gear reduction weighs 525 lb. The electric design is conventional, with 600 volts on each commutator. The gear reduction housing surrounds the double-reduction helical gears. The motor is coupled to the gear reduction by double universal joints which allow a rigid support of the motor and a freedom of movement of the gear reduction without misalignment strains on either. Ball bearings are used throughout, and the gears dip in oil.

A model of the constant oil level bearing shows visually the path of the oil with this type of lubrication. As its name implies, the bearing maintains the oil supply to the waste packing at a constant level. As oil is used by the bearing the constant level is maintained by oil passing from an ample supply reservoir to the constant oil level chamber. The level in this chamber may be set at the most efficient height.

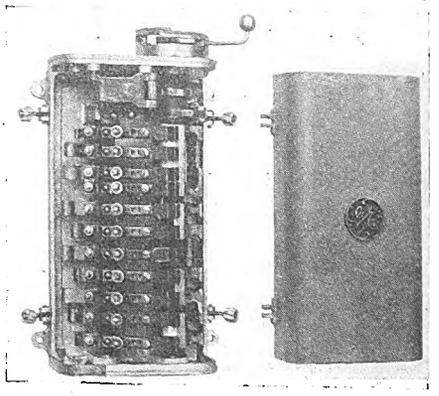
There is a display of renewable carbon way brush-holders to show visually the advantages of this type and also to show the simplicity of the construction used in the present-day brush-holder. Display boards with various types of carbon brushes also will be shown.

An entirely new development shown by the General Electric Company is the PCM control, which was brought out to meet the need for quicker starts in congested city streets. Other control equipment shown in a display rack includes a standard four-motor K-35 controller and a K-75 low-height controller, equipped with LB-2 and LB-4 line breaker control devices, and connected so that they will actuate the line breakers that are part of the display. The line breaker is the standard DB-987 having a capacity suitable for four 75-hp., 600-volt motors.

Display boards will show the many types of controller fingers and arc deflectors used in controllers. MS switches and MR circuit breakers indicate the improvements that have been incorporated during the past year.

In resistors, the standard BG cast-iron type and the EW edgewise-wound ribbon type are exhibited. The latter has the new unbreakable resistance conductor, whose features are few joints and light weight. The terminals are braced to the resistance conductor and substantial bolts are used for clamping the terminals.

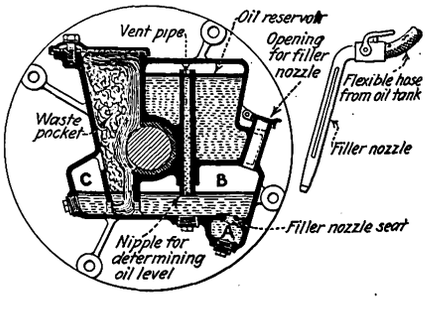
A complete operative equipment of the new electrically actuated type will be displayed by the Safety Car Devices Company. The advantages claimed for it are shorter application and release times with greater flexibility of control, more prompt action of doors, possibility of incorporating automatic safety features in either the controller or the brake valve as desired, fewer pipes and lower weight.



The S-174 automotive controller of the General Electric Company, for double-motor electric drive

The same company is exhibting, both as part of the main display and among a group of detached apparatus, a diaphragm-type foot valve and a diaphragm-type cutoff valve, used to replace the former combined foot and cutoff valve. The separation of these devices simplifies the equipment somewhat, since only one cutoff valve is required for either single-end or double-end equipments.

A complete line of economy electric railway meters is being shown by the Economy Electric Devices Company. These include both the plain watthour meter and the meter with car inspection dials.



General Electric constant oil level bearing for railway motors

The National Carbon Company will exhibit its full line of National Pyramid carbon, graphite and metal-graphite brushes for motors, generators and converters and also will have a complete display of carbon electrodes, rods, blocks and paste used in the electric arc and acetylene welding processes.

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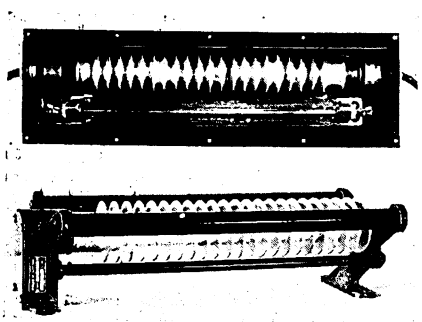
Changes to Reduce Weight Feature

LATEST CAR EQUIPMENT

Aluminum is used in many car equipment parts. Resistor type electric heaters smooth out power peaks. Refinements in fixtures and furnishing show de luxe trend

THAT increased attention has been given the improvement of car equipment in order to keep pace with the de luxe trends in car construction is shown from the many displays at this year's convention. New developments and improvements are shown at nearly every booth. When one considers car equipment, the first thought is of the larger parts, such as heaters, door engines, trolley bases and poles, control and air brakes. The smaller parts, however,



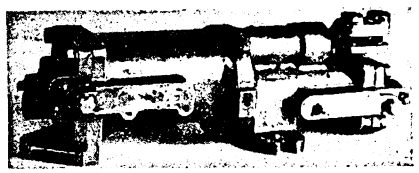
Panel type motor resistor heater in case with standard type heater for installation along sides of cars, and motor resistor heater with foot rest for installation under cross seats. Consolidated Car Heating Company

constitute the real bulk of purchases. These include such items as window fixtures, weather stripping, sash balances, anti-rattling devices, stanchions, door hangers, curtains, floor plates and step treads. Modernized and improved designs are shown in all these lines.

Probably the most interesting development in heater construction is in the use of resistors connected in the main motor circuits so that energy wasted in accelerating the car and the current generated in dynamic braking are utilized for heating the car interior. Rheostatic heaters for this class of service are shown by the Consolidated Car Heating Company, Inc., The Railway Utility Company and the Westinghouse Electric & Manufacturing Company. There have been several trial installations of such heaters and the Cleveland Railway has installed 50 equipments manufactured by the Consolidated Car Heating Company, Inc., in its new articulated units. Of two motor resistor types of heaters shown in the Consolidated exhibit, R-1065 is designed to be placed underneath the cross seats and has a foot rest. The heating element consists of a motor resistor unit cast in an aluminum radiator shell. The resistor is a high resistance nickel-chromium alloy wire inclosed in a seamless steel tubing filled with manganese oxide. After filling the steel tubing is swedged to a smaller diameter, thus compacting the magnesium and wire into one solid unit. The type R-1460 motor resistor heater, for mounting in a duct along the sides of the car, consists of a motor resistor unit and a regular car heater unit in the same case. This is the type used in the Cleveland cars.

The Consolidated Car Heating Company, Inc., is also showing an improved design of safety switch for car heaters. Fuses for the different circuits are mounted in a compartment of the switch box, the cover of which can be opened only when the switch is in the open or "off" position. The switch is of the toggle type and the mechanism is designed to open the contacts without depending on a spring. The arc chute is hinged and can be swung up easily, exposing the contacts for inspection.

A relay designed to cut off the heater load during acceleration is

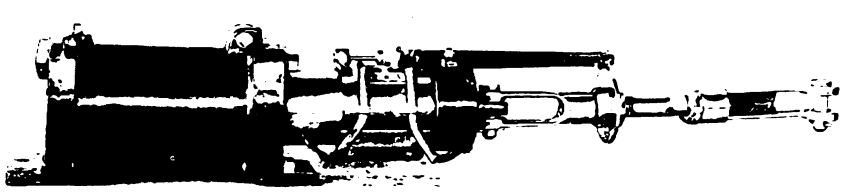


Light-weight door engine. Consolidated Car Heating Company

another improvement shown by the Consolidated Company. The relay coil is in series with one of the motors. When current reaches the value for which the relay is calibrated, contacts will close the circuit and open the magnetic switch which controls the heaters in the car.

An improved inclosed type element for electric heaters is a feature of the exhibit of the Gold Car Heating & Lighting Company. This company stresses the value of interchangeable elements in electric heaters, and shows improvements in switches, ventilators and automatic temperature regulating devices. The Railway Utility Company is featuring its Chromalox strip heater. Improved features for the car rider's comfort shown by this company include heat regulators, ground detectors and ventilators. The company is a strong advocate of the value of having heaters with underwriters' labels.

The lightest trolley base that the R. D. Nuttall Company has ever built is featured by that company. This is built of aluminum and weighs but 67 lb. It has double race Timken roller bearings, hardened steel wearing parts and other features. An-



Door switch mounted on differential door engine. National Pneumatic Company

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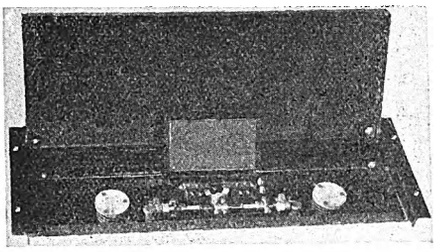


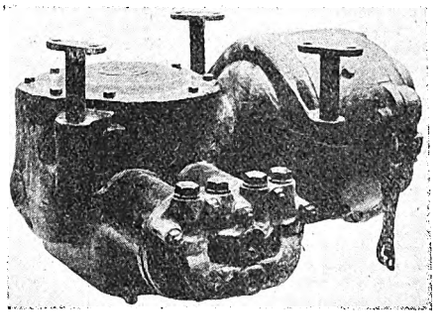
Treadle switch mechanism. Consolidated Car Heating Company. Treadle plate raised to show construction and rubber stops

other type, the U. S. 20-A roller bearing trolley base, weighs only 104 lb. It has tapered roller bearings, a grease reservoir which requires filling but once in each six-month period, a dust guard to eliminate the possibility of dirt getting into working parts and a bronze shunt for conducting the current around the roller bearings. This company also has an interesting array of trolley poles, harps and wheels. A light weight trolley base is also shown by the Ohio Brass Company. The standard Shelby seamless steel trolley pole is reinforced by a new method so that the reinforcement becomes practically integral with the body of the pole. Trolley harps are designed with a view toward light weight, strength and toughness, and wheels to stand the severe usage of electric railway service.

The White Manufacturing Company has an interesting design of trolley harp and axle. The harp is made of high-grade malleable iron with screw-attached phosphor bronze contact springs. Trolley catchers and retrievers in operation are shown by both C. I. Earll and the Eclipse Railway Supply Company. This latter company is also showing a new model retriever for sliding shoe service with light pole tension.

Known widely for its snow scrapers, the Root Spring Scraper Company has a full line of these on exhibit. In addition, it is showing an improved lifeguard for use by railways in their modernization program. The Eclipse Railway Supply Company also has a full line of improved car fenders and life guards.

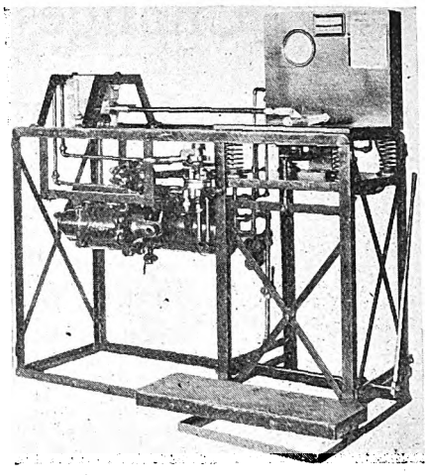
Differential door engines with new features are a part of the exhibit of the National Pneumatic Company. This type of engine is suitable for operating light-weight folding doors and steps. A substantial door switch designed for mounting on this engine is capable of completing two circuits when the door is opened and two additional circuits when the door is closed. A light-weight aluminum door engine is a feature of the exhibit of the Consolidated Car Heating Company, Inc. Adjustments for



Center gear type air compressor with T-bolt suspension. General Electric Company

controlling the engine speed are made in the cylinder heads. These are accessible from the side, which is desirable when the engine is mounted in door compartments. Although aluminum is standard, this engine is also furnished in cast iron when extra weight is not objectionable.

Automatic treadle controls for doors are features of both the Consolidated and National Pneumatic Companies' exhibits. One of the features of the Consolidated design is that the treadle plate stops on rubber. This eliminates noise. The treadle switch, mounted in a steel box, is a unit by itself. One of the features of the switch design is that the finger makes a sliding contact on the underside of the contact bar. The full floating type of treadle is featured by the National Pneumatic Company.

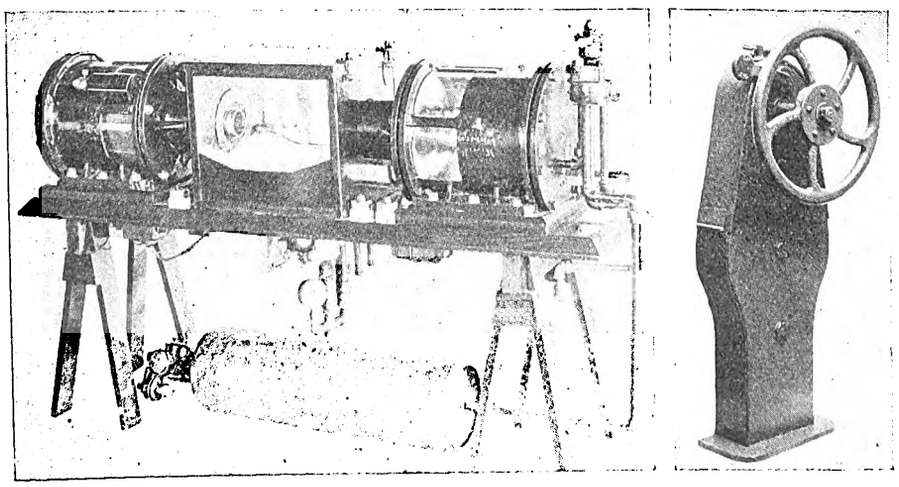


Demonstration rack of variable load brake equipment. Westinghouse Traction Brake Company

A new type of sliding door track containing a renewable bearing surface for door-hanger rollers is shown by the National Pneumatic Company. Other types of improved ball bearing door hangers of the diamond type and special door fittings are included in the exhibit of the Ellcon Company. Aluminum and steel doors with improved features are also shown as a part of the Morton Manufacturing Company's exhibit.

Various types of floor coverings and materials for floor construction form interesting displays for officials advocating improved cars. Tuco-Flexolith composition flooring for cars is shown by the Tuco Products Corporation, aluminum and steel flooring by the Morton Manufacturing Company and standard Diamond and Diamondett floor plates by Alan Wood Iron & Steel Company. Improvements have been made in step treads and in standard forms of folding steps for trolley cars.

Several new products are shown in materials for wainscoting, headlining, car insulation and roofing. The Pantasote Company, Inc., long a pioneer in this field, is showing Agasote and Pantasote in a multitude of uses. Car insulation and Masticoke flooring are shown by



At left, demonstration rack of brake cylinder protector. Westinghouse Traction Brake Company. At right, heavy type Peacock brake of National Brake Company, Inc.

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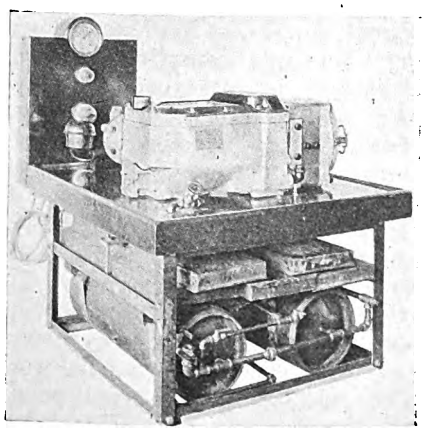
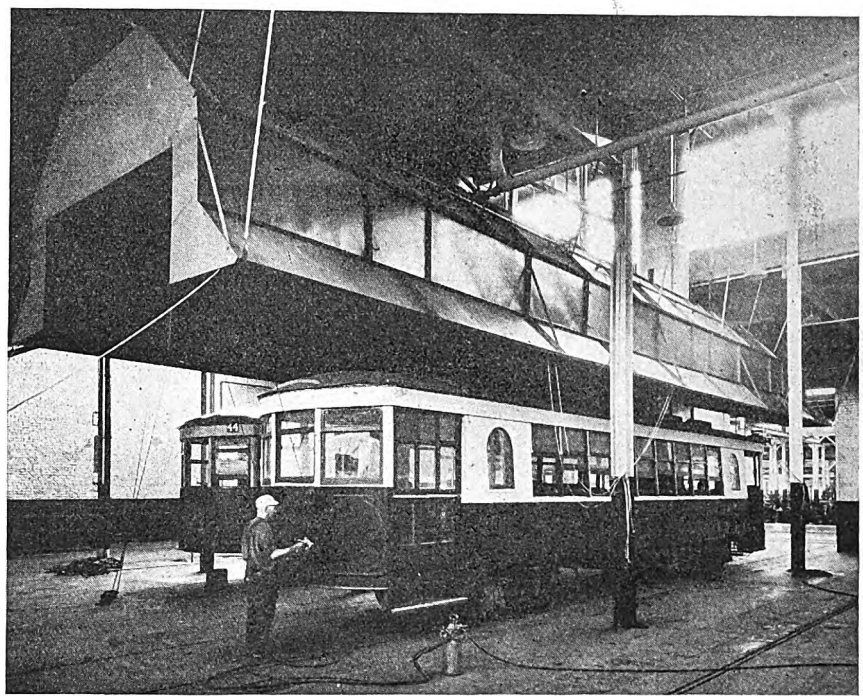
Johns-Manville. A new headlining and side material in the form of porcelain enameled sheets is featured by the Ellcon Company. It is hard, durable and stays clean and bright. The Adams & Westlake Company also show a full line of curtain material. Haskelite, Plymetl and Aluminum-Plymetl are demonstrated and uses shown in the Haskelite exhibit.

Improvements in metal sash, window fixtures, weather stripping, sash balances, anti-rattling devices, screen holders, door locks, hinges, etc., are interesting displays of O. M. Edwards Company, Inc., and the Eberhard Manufacturing Company.

Brake parts show many improvements. A feature of the Westinghouse Traction Brake Company's exhibit is a DH-20 bungalow type air compressor of aluminum. This compressor is operative and has a glass top in the crankcase and gear case cover to permit ready inspection of the method of lubrication. A governor for motor-driven air compressors shown by this company is of advanced design. New structural features have been introduced. Another feature of this company's exhibit is a demonstration to show the effectiveness of its brake cylinder protector. Two brake cylinders having glass windows permit observation, one equipped with a protector, the other without. These are mounted on a base with their non-pressure heads projecting into a dust chamber. When the brakes are applied and released and dirt is agitated in the chamber, it is drawn into the cylinder upon the return stroke of the piston. In one, however, it is prevented from reaching the cylinder walls by the protector. Another rack is used to demonstrate how air brake cylinder pressure is adjusted automatically with the variable load brake as car weight changes.



Lightweight bungalow type air compressor, arranged with glass to show operation. Westinghouse Traction Brake Company



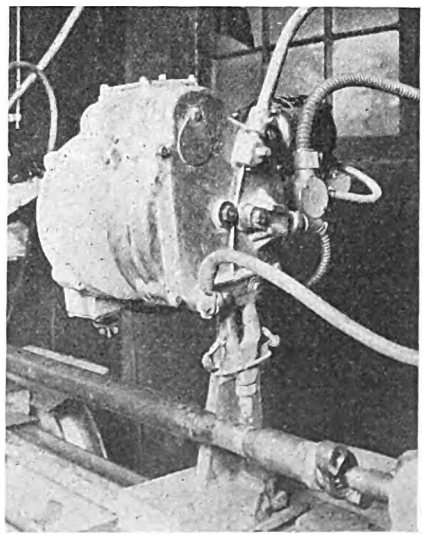
Forced draft and ventilating arrangement used by Cincinnati Street Railway and furnished by the De Vilbiss Company

An improved type of hand brake developed particularly for electric locomotives is shown by the National Brake Company, Inc. This has a 16-in. wheel and will develop a braking force of 8,800 lb. on the chain. A special ½-in. chain is used to withstand the heavy duty.

An exhibition rack containing air brake equipment is a feature of the General Electric Company's display. The equipment shown includes aluminum alloy castings for the frame, frame head, crank chamber cover, oil distributor and cylinder head of the air compressor. It is shown in operation with a glass cover. The weight of the compressor is 28 per cent less than one made of cast iron. A second innovation is rubber-cushioned suspension bolts where rubber in tension is used to reduce vibration and noise. A flexible discharge pipe prevents transmission to the carbody of the noise and vibration. The air intake strainer is of the centrifugal type which tends to throw the dirt and dust to the outside of the strainer body from where it drops out by gravity.

An exhibition table in this exhibit contains a motorman's valve piped to a pneumatic contactor. This is part of the electro-pneumatic brake equipment furnished the Boston, Revere Beach & Lynn Railway. The motorman's valve is similar to the standard valve for automatic variable release air brake equipment except that it has additional parts for operating the pneumatic contactor. This latter controls the action of magnet valves mounted on the triple valves throughout the train. A display of compressor parts illustrates the precision with which these parts are manufactured, the generous proportions of the bearings and such details.

Demonstrations of paint and spray painting equipment are interesting. A working model of the new car exhaust system for spray painting as installed in the shops of the Cincinnati Street Railway is shown in the



The Una-Goodspeed automatic welding head gives uniform feed to electrode wire

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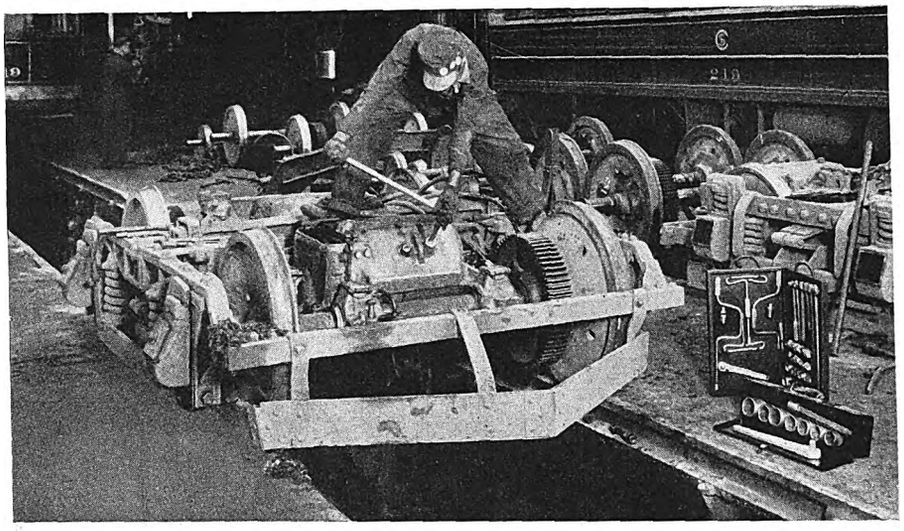


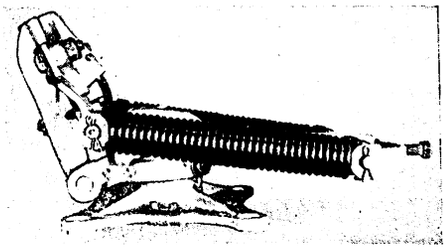
Using a Snap-On wrench set for truck overhauling

exhibit of the De Vilbiss Company. Constant increase in the use of lacquer paint and of high-speed spray guns has brought about a need for an improved exhaust system. The control of air currents is so delicate that considerable research work has been required to develop this exhaust system. Both blowers and exhaust fans are used with this exhaust equipment. Draft is induced from outside and forced up from the floor where it collects the spray vapor as it passes up the side of the car. The air is picked up from this point by overhead suction fans which force it out through the roof to the outside of the building. The input air ducts in the floor are parallel to the track and are arranged with vents and baffles so that the air is distributed evenly on both sides for the full length of the car. The arrangement is such that the air is forced out in a direct line along the side of the car, forming a wall of clean fresh air taken from the outside atmosphere.

The canopy exhaust overhead is provided with special 42-in. exhaust fans and is equipped with sprinklers. Both the closed head and the open head types are used. The latter is for flushing. The hinged panels on the under sides of the canopy can be moved by small ropes and pulleys, so that the operator can work on top of the car with the same protection as when working on the sides.

Railway enamel, roof enamel, headlining enamels, inside finishes and late developments in G.M.F. and Ripolin systems are demonstrated by the Glidden Company. The latest developments are shown for finishing cars and buses with this company's product. In addition, panels show many other types of finishes.

The Binks Spray Equipment Company shows a complete line of spray finishing and ventilating equipment.



Light-weight, aluminum trolley base of R. D. Nuttall Company

An improved spray gun, inclosed type window fans and motor agitated pressure material containers are featured.

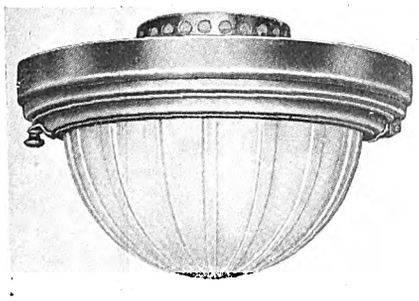
Speed in application and drying of a new oil-base undercoat system is demonstrated by the R. F. Johnson Paint Company. This is claimed to have the economies of old-time processes with the speed of pyroxylin added and uncertainties eliminated.

Among the maintenance tools shown are several by the Martindale Electric Company. This includes a commutator slot cleaning outfit with a heavier shaft and sheath, one foot longer than previously supplied. The Growler is a new Martindale product. It is used to test small motor armatures for shorts and grounds. A hinge at the base permits it to be opened and closed to fit various armatures, and the amount of iron and winding also may be varied. Its windings are inclosed in a metal case and protected from mechanical injury. All live metal parts are inclosed. The commutator-slotting equipment shown by this manufacturer includes several improvements. Armature repair tools shown include rawhide mallets and hammers, wedge drivers, insulation scrapers, feeler gages for armature air gaps, and a coil tamping tool.

There is a tremendous amount of wrench work in connection with the maintenance of car equipment. To provide for speeding up this work, the Snap-On Wrench Company shows its complete line of socket wrenches for hand operation. This includes a new line of thin-walled sockets designed for work in close places. Some railways report a particular saving in time through the use of this type of wrench, and the company also stresses the importance of the safety features of these tools. When floors of shops are slippery, serious accidents sometimes occur from a wrench slipping off the nut.

A new self-contained 200-amp., one-man arc welding outfit shown in the Westinghouse booth is distinguished by its simplicity, compactness and ruggedness. Many parts that usually identify arc welders, such as the bed plate, truck frame, array of knife switches, and rheostat contacts have disappeared. Total inclosure of the top and sides protects the machine from dirt, drip and falling materials. The new line-start type of dual-voltage motor and starter are used. It is portable and its narrowness and short wheelbase make it easy to move in restricted places.

A head for automatically feeding the electrode wire in arc welding is shown by the Una Welding & Bonding Company. The Una-Goodspeed head, as it is called, consists of two single dry plate clutches driven by a constant-speed motor through a worm reduction gear. One of these clutches, which revolves in such a direction as to move the electrode wire away from the work is engaged constantly by three coil springs. The other clutch, controlled by a solenoid across the arc, revolves so as to move the electrode wires toward the work. The solenoid is connected permanently across the arc. Due to the balancing of one clutch against the other, the electrode wire is fed down with a steady movement.



Compensating-series lamp fixture shown by Electric Service Supplies Company

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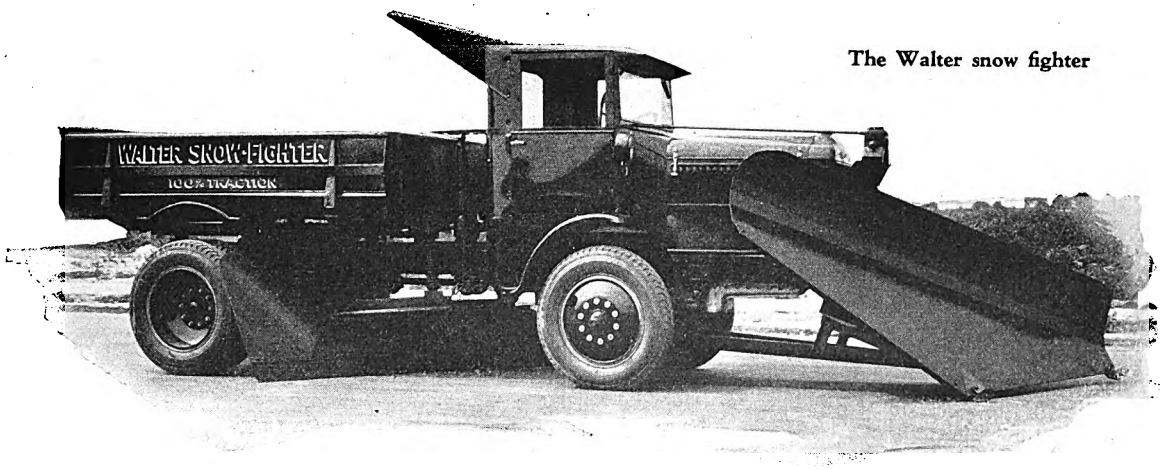

The Walter snow fighter

Bus Accessories and Garage Equipment

Many new devices for reducing operating and maintenance costs have been developed. Parts for buses are shown by a number of manufacturers

SECOND only in interest to the bus bodies and chassis, in so far as bus operators and maintenance men are concerned, are the exhibits of the accessory manufacturers, covering a wide range of apparatus displayed in a most interesting manner. A number of new and unusual developments are shown and it is quite evident that substantial progress has been made in many departments.

Bus front and rear axles, both bevel and worm gear, and in a variety of sizes, are shown in the exhibit of the Timken-Detroit Axle Company. An interesting feature of the display is a worm gearing that is said to have been operated for 585,000 miles in bus service and which, apparently is good for many additional miles.

Multiple-disk clutch facings, brake lining, fan belts, waterproof straps, webbing, hood lacing and tow lines are included in the display of the Russell Manufacturing Company.

The Johns-Manville Corporation is displaying its full line of woven and molded brake lining, clutch facing, packings, asbestos ebony for control panels and electrobestos.

The model KU-10 transmission set up in the booth of Fuller & Sons Manufacturing Company cut away to show full operation of clutch and transmision, is designed for trucks of 1½ to 2-ton capacity, maximum chassis weight 4,000 lb. when used in connection with six-cylinder engines of 249 cu.in. piston displacement.

A complete line of heavy-duty spring bumpers and body guards, designed especially for use on buses and taxicabs is being shown by the C. G. Spring & Bumper Company.

In the exhibit of Continental Motors Corporation a sectional bus engine will be shown in operation, so arranged as to afford a clear view of all moving parts. This company is also showing its latest and stock model engines designed for buses, trucks and a variety of industrial purposes.

Waukesha Motor Company is showing two bus engines of 75 hp. and 120 hp. rating, a recently developed high-powered six-cylinder engine, together with parts and accessories for all its standard equipments.

The wide uses of aluminum are illustrated by the extensive display of products exhibited by the Aluminum Company of America. Of special interest to bus men are the various cast and forged parts incorporated into the bodies and framework of the Versare and Twin Coaches, and an all-aluminum chassis, built in 1920 and now driven over 200,000 miles in service.

Included among the three heavy duty six-cylinder L-head engines exhibited by the Hercules Motor Corporation is the one recently developed by this company for the Twin Coach Corporation and used in the latest buses produced by that company. This exhibit is supplemented by crankshafts, pistons, bearings and connecting rods.

The Robert Bosch Magneto Company has a comprehensive display of spark plugs, voltage regulated generators, horns, windshield wipers and spot lights. The type FD horn, made in 6-volt and 10-volt sizes, is said to have an unusually clear and penetrating pitch and tone, and to be free from troubles arising from vibration.

The Willard Storage Battery Company is exhibiting a standard line of heavy and medium plate bus batteries as well as batteries for oil switch operation, power and signal work.

The actual operation of and lighting effect produced by its Tilt Ray headlamp, as well as a practical demonstration of the proper aiming and focusing of headlamps is a feature of the exhibit of the Guide Motor Lamp Manufacturing Company. Illuminated displays are used to demonstrate the company's dome lamps, marker lamps and tail lamps.

Those who are interested in ball and roller bearings will find much to interest them in the several displays in the exhibition hall. Both in street

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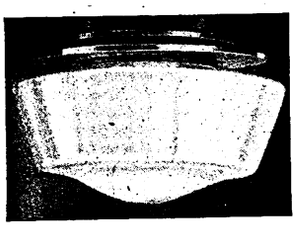


Electric Service Supplies Company's Keystone-Ivanhoe bus lighting fixture

car and in bus service it has long been recognized that to the precision and delicacy with which bearings are adjusted much of the success of the transportation industry is due. The display of the Timken Roller Bearing Company consists of a mountain scene with a city street in the foreground, showing a miniature electric train in operation, with toy buses, autos and trucks moving up and down the streets. It bids fair to be one of the distinctive features of the exhibition.

The Norma-Hoffman Bearings Corporation is showing its precision ball and roller bearings in a variety of open and closed types, suitable for use on buses, trucks, street cars and steam railroad cars or in electrical machinery of various kinds. Working models stress the importance of protecting the bearings against dirt and grit.

A complete line of ball bearings in double row, single row, radax and magneto types is being shown in the booth of the New Departure Manufacturing Company. The double row bearing, a patented design, is of particular interest, with two rows of balls and two sets of ball raceways, mounted in such relation as to sustain loads and stresses from any direction. The magneto type bearing is designed to carry end thrusts as well as radial loads.

The exhibit of the Ahlberg Bearing Company will feature a display known as the "One Ball" demonstrator, which shows the accuracy of ball and race grinding which goes into the make up of their bearings. The exhibit includes the CJB master ball bearing and the Ahlberg ground bearing.

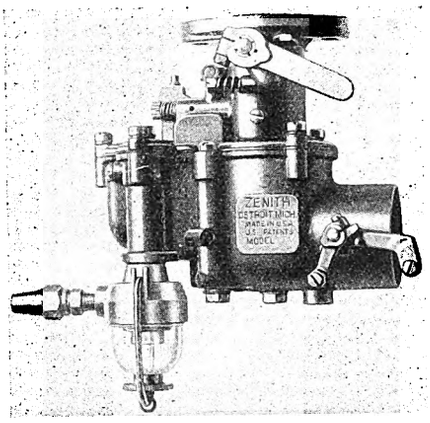
The Hannum Manufacturing Company is represented by a display of bus and motor truck steering gears, with working models illustrating the various features by which the product of this company are distinguished. The Hannum steering gear uses the Timken tapered roller bearing instead of the ball thrust assembly and has a variable ratio which is claimed to permit of faster and easier steering in normal driving range and increased leverage in the extreme steering position. The models also demonstrate how adjustments can be made without removing shims or the gear from the chassis.

The paint and varnish division of the Pittsburgh Plate Glass Company has on display a set of panels showing decorative effects and color schemes for street car painting. The glass division is featuring its Duplate glass, a clear, non-shattering glass for automobile and street car windshields and windows.

Among the new apparatus being shown for the first time by the Electric Service Supplies Company may be enumerated the type DBG-918 Golden Glow Headlight, a bus combination rear and stop light, new types AK and SK Keystone-Ivanhoe bus lighting fixtures, and a number of new types of Hunter illuminated signs. This company has also adapted many of the appliances long familiar in the street railway field to use on buses.

Branding irons operated by electricity, gasoline, and gas and air, as well as blow torches and soldering irons are to be seen in the booth of the Everhot Manufacturing Company. This company has also brought out and is exhibiting a combination interchangeable route sign for buses or cars.

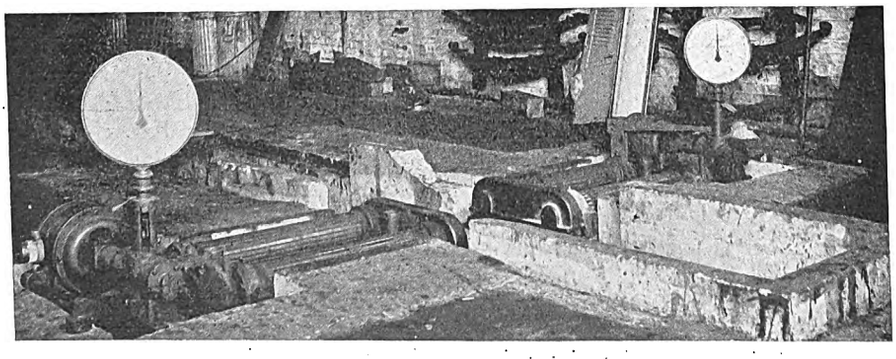
A new model brake drum lathe, demonstrated by expert mechanics in the exhibit of the South Bend Lathe Works, is of interest to bus and truck fleet operators as it is said to eliminate the common forms of brake drum and wheel truing troubles. The self-centering mandrel is credited as being the key to this accuracy. The wheel or drum when mounted on this mandrel and placed between centers of the lathe will run true, and all machining will be concentric with the axis of the hub. Bearing adapters and mandrels are made in sizes to fit any type and size of front wheel of bus or truck.



Carburetor and fuel filter exhibited by Zenith Detroit Corporation

Carburetors and fuel filters of various styles and designs are on exhibit by the Zenith-Detroit Corporation. A filtering element made up of spacers and washers is held together on a stem, each stem representing one filtering element with an equivalent fineness of 120-mesh wire gauze. It is said to be easily cleaned and adjustable and is adapted for use on heavy duty trucks, buses and marine engines. Among the carburetors displayed are the 70 series, made in $1\frac{1}{4}$-in., $1\frac{1}{2}$-in. and 2-in. sizes. This is a heavy-duty type with concentric float mechanism, which enables it to be operated on angles up to 40 deg. without interfering with carburetion. The 910 carburetor is the heavy-duty type, made in the $2\frac{1}{2}$-in. size only.

The Westinghouse Traction Brake Company is exhibiting both types of its automotive brake—the pressure type and the new vacuum type. Among the improvements embodied in the pressure brake apparatus is a compressor having better oil distributing system, centrifugal air cleaner, and unloader head with automatic governor. The vacuum type automotive brake was developed for buses and the lighter type of commercial vehicles to meet the need for eas-



Cowdrey brake testing apparatus in position

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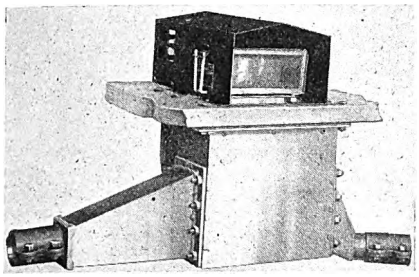


Nichols-Lintern floor-type auto heater

ier and more effective control than is possible with the ordinary foot brake. The brake unit comprises an operating piston, a simple valve mechanism, and an ingenious leverage system. The force actually applied to the brake drums is a combination of foot pedal pressure and power generated in the brake unit. In addition to the detached units and sectioned model of the vacuum brake there is a demonstration chassis by means of which it can be effectively shown how this brake reduces the physical effort of braking.

The Bragg-Kliesrath Corporation is showing its vacuum booster brake which utilizes vacuum of the intake manifold for power application.

Bus, truck and trailer air brakes and vacuum air brake apparatus is also being shown by the Christensen Air Brake Company, while the Bendix Brake Company is featuring its Bendix Four Brakes. The American Brake Materials Corporation is represented by a line of its thick and thin types of brake blocks for heavy automotive vehicles and industrial machinery.

Developed with the idea of making brakes better the apparatus of the Cowdrey Brake Tester Organization is used not only by a considerable number of bus and truck fleet operators but has been installed on the production lines of many of the large automobile manufacturers. The apparatus, of which a No. 11-A model dynamic tester is exhibited, is said to be of great value in determining the retarding force in brake sets and in eliminating the uneven wear in brake lining and tires. The device is designed to chart mechanically the relationship between motor vehicle weight, retarding force and retardation.

The National Railway Appliance Company displays a number of the products which it handles, among them being the NSD gong ringer, the Godward gas generator, Garland ventilators, the Bell fare box and Tapley brake-testing meters.

Brake drums of furnace gun iron are being shown by the Hunt-Spiller Manufacturing Corporation.

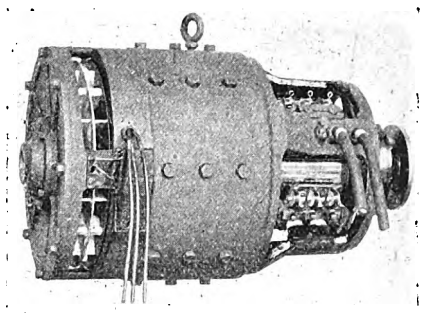
The Gunite Corporation also has an interesting display of brake drums, clutch plates and gears cast of its gunite metal or graphitic steel. The manufacturers assert that the use of this alloy metal in brake drums not only gives a smoother wearing surface but one that will show unusually long wear.

A complete line of heavy-duty electrical equipment for bus service including generators from 220 to 800-watt capacity, starting motors, ignition units of all types of drive, motor driven and magnetic horns,

Spoksteel dual rear bus wheel, exhibited by Motor Wheel Corporation

voltage regulators and junction boxes is being shown by the North East Electric Company. They are also displaying an arrangement which illustrates how the electrical system of a bus functions. The exhibit includes service and test equipment for electrical maintenance.

The Walter snow fighter on display is mounted on a special motor truck with positive drive to all four wheels from a 100-hp. six-cylinder motor. The units have dump bodies or wrecker bodies, as desired, so that they can be made available for serv-



DT-1121 generator for electric drive, exhibited by General Electric Company

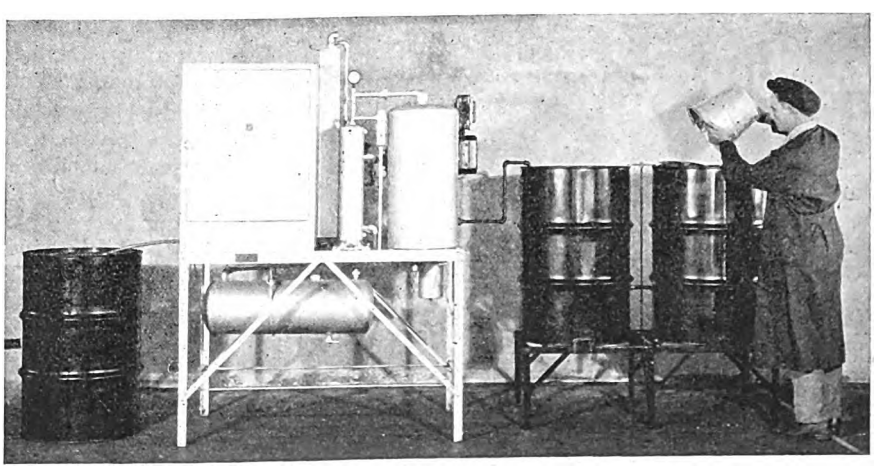
ice in construction work throughout the entire year.

The Arco Company of Cleveland is demonstrating its process of coach body finishing by the Arcozon pyroxylin system, whereby a gloss finish is secured without polishing.

De Luxe light-weight gray iron pistons for bus engines are being exhibited by the De Luxe Products Corporation. The claim is made that these pistons will stay perfectly round under the heat of the engine and will keep cool under severe operating conditions.

Bronze-back babbitt-lined connecting rod, and main and crankshaft bearings, both standard size and undersize, bronze bushings, piston pin bushings, babbitt metals for shop maintenance and connecting rod work will comprise the display of the Federal-Mogul Corporation. Federal bronzes and bearing metals have been developed for a variety of uses. A number of boring machines produced by this company are also in the exhibit.

Appreciating that carbon monoxide is present in exhaust gases to a dangerous degree the Nichols-Lintern Company has developed a heater that is said to absolutely prevent any gases from entering the coach body. A high



The Skinner Automotive Devices Compan's oil reclaimer

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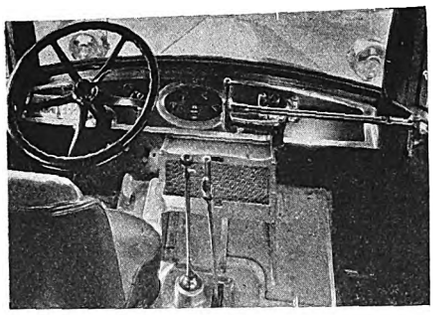


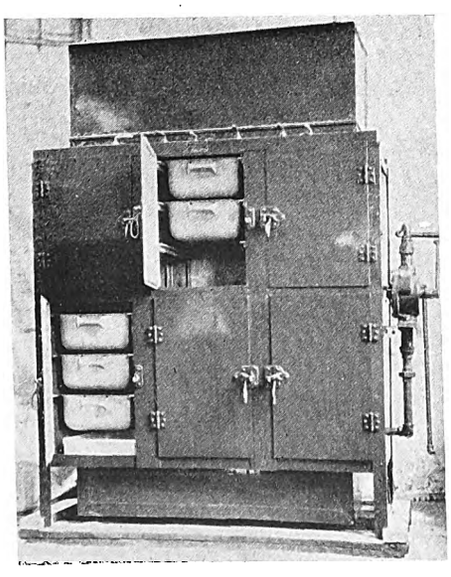
Tropic-Aire heating unit is located under instrument board in forward end of the bus

heating efficiency is obtained through the use of seamless-steel finned tubing which allows concentration of a large heating surface in a small area. The heater is intended for location near the center of the coach. Nichols-Lintern is also showing a cast aluminum "Stop" signal lantern for mounting at the rear end of a bus with the view of preventing rear end accidents, and a roof ventilator made of Armco galvanized iron, designed to provide a high exhaust at low speeds.

The Cleveland Pneumatic Tool Company is showing a complete line of Gruss and Westinghouse shock absorbers for use on buses.

The increasing weights carried on buses and motor trucks, has brought many problems to the wheel makers, and intensive research has been necessary in order to keep pace with the demands.

The Budd Wheel Company exhibit shows the method of mounting a 20-in. and a 24-in. diameter wheel on the same hub; also the double cap nut method of mounting which permits of clearance around the stud when changing tires.



The Johnston & Jennings Company's type F 6 Alten oil reclairmer

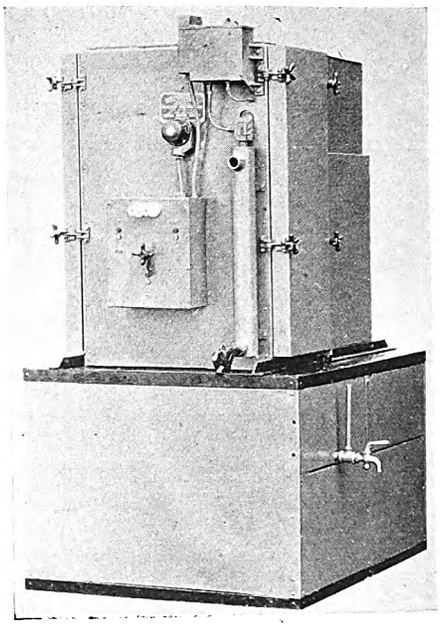
The Motor Wheel Corporation, whose product is marketed under the trade name of Spoksteel, has a display of bus and truck wheels both dual and single. The spider or spokes are of one-piece, high carbon, drop-forged steel. Various tire sizes can be mounted on the same hub, using the same brake drums, which should simplify matters where a quick change is necessary.

Both the Westinghouse and General Electric companies are exhibiting motor and generator equipment for the gas-electric drive of buses. The Westinghouse display includes a type V-92-F motor and type 177-F-2 generator. The General Electric exhibit includes a standard motor for dual motor drive where the engine capacity is 95 hp. This is the motor supplied for buses with the DT-1121 generator, and is in service on the Yellow coaches supplied to the Public Service Co-ordinated Transport and the Philadelphia Rural Transit Company. The DT-1130 generator and the GE-1140 motor, of light weight and intended for service on gas-electric taxicabs is also displayed.

Bonded asbestos brake lining, for use on buses and on street cars equipped with automotive brakes is shown in the exhibit of the Ferodo and Asbestos Company, Inc.

Those interested in the reclamation of crank case, shop and transformer oils will be attracted by the several appliances for this purpose that are included in the exhibit. The Skinner Automotive Device Company, Inc., is demonstrating an automatic electrically-operated oil reclaimer with a reported capacity of 5 gal. per hour at an expense of about 8 cents per gallon. The Johnson & Jennings Company has a working exhibit of its type K Alten and its type F-6 Alten oil reclaimers, as well as specimens of crank case, shop and transformer oils, new, dirty and reclaimed. The Hilliard Corporation is showing its Refineroil, an automatic electrically-operated apparatus for reclaiming used crank case oil, which was developed by the research laboratory of the General Electric Company and is manufactured under license from that company.

A motor-generator set and display stand showing a bus type of voltage regulated generator in operation constitutes a part of the display of the Leece-Neville Company. The generator is arranged so as to show the charging of a motor coach storage battery, using glass cells and demonstrating the harmful effects of a

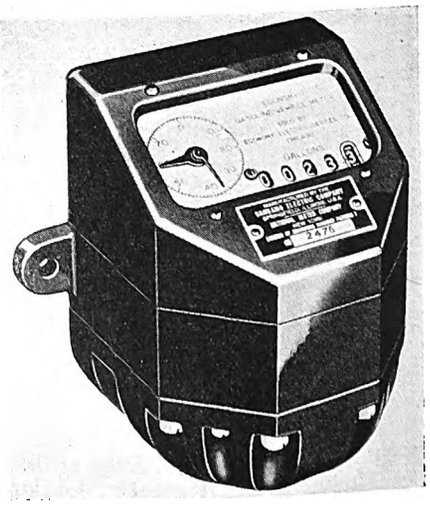


The Refineroil, an automatic electrically-operated oil reclaimer manufactured by the Hilliard Corporation

current-regulated generator, also the operation of a voltage regulated generator without storage battery. The company is also showing starting motors, ignition units, overload breakers and remote control starting switches.

An accurate device for measuring engine fuel consumption on motor buses is shown in the exhibit of the Economy Electric Devices Company. The meter has been designed to produce a rugged, dependable integrating meter registering and recording the actual fuel consumption of an engine to the nearest tenth of a gallon.

The exhibit of the C. H. Wills Motor Corporation shows the complete installation of a Tropic-Aire heating unit, including the rear end unit intended for installation in large capacity buses.



Recording gasoline meter developed by Economy Electric Devices Company

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MORE COMMODIOUS SEATS
In Evidence for Cars and Buses

Luxuriousness, comfort and durability are features of new products. Numerous developments are made in upholstery fabrics and leathers

DEVELOPMENTS in car and bus seats are keeping pace with the splendid strides made in body design. Attention has been focused on passenger comfort and has resulted in revisions in spring work and frame assembly details. Aside from comfort the designers of seats have paid particular attention to attractiveness and prolonged durability of their products.

The individual, special bucket type seats of the kind used in the Pittsburgh experimental cars, are displayed by Hale & Kilburn Company. This seat is almost semi-circular on the outside. The chair backs are covered on the front surface with canvas-lined rattan and on the rear with painted sheet steel. A round leather cushion in each seat is mounted on a formed steel pan, which in turn is fastened to the pedestal brackets at three points spaced on a triangle, so that when the cushion is worn on its front edge it can be mounted in two other positions to prolong its life by distributing the wear. Easy cleaning is made possible by a clearance of about ¾ in. between the cushion and the surrounding back frame. The cushions and back are pitched to a comfortable seating angle.

For interurban needs, Heywood-Wakefield has designed the new model 327-M seat. Incorporated in this design are deep, double-spring cushions which are shaped to allow more leg freedom. The mechanism rails are set in and the backs, which are individual, are pitched for comfort. Another interurban type of seat put out by this company, No. 55 PX, consists of a two-passenger chair mounted on the recently developed revolving base. This base requires no greater spacing than the stationary type. The chair revolves easily by pressing the pedal located on the base.

Two new parlor car chairs, patterns No. 16 and 35, have been brought out by Hale & Kilburn. No. 16 has a high back and side arm, giving unusual comfort. General improvements made in chairs produced by this company comprise certain changes in the spring work and frame assembly. Other interurban chairs shown in this company's exhibit include one of comfortable proportions with an intermediate arm rest and upholstered in combination leather and plush, a double rotating chair suitable for use in double-end interurban cars, a double rotating chair with collapsible division arm rest and upholstered in a combination of leather and plush.

At left, individual chair designed by Hale & Kilburn for the Pittsburgh Railways. At right, parlor car chair of the same manufacturer for interurban service

Heywood-Wakefield is exhibiting a luxurious chair of fine woven fiber. It has removable spring cushions over deep, built up springs. The shaped spring back pads are removable. This chair is made with only one arm rest to increase comfort and seating space without adding to the over-all length. On the back is a 10-in. deep kick pad of carpet. The frame is made of ash held with dowels and has double-clawed, malleable iron legs with shock absorbers. The 55-P special is a high-back, all leather chair built to stand up under hard usage. The chair is strongly braced with malleable iron castings at all points where strain is apt to come and is further reinforced with sheet steel. The high back affords more relaxation, a necessity on distance runs.

Cross seats made by this company include type 8C5 special, which has a double-spring cushion construction. The mechanism of the seat is made of pressed steel. By the supporting frame construction, from 1 to 2 in. have been added to the knee room available for the passengers. No. 8L5-A special rattan seat is designed for severe use. The cushion of this seat has a spring-edged front and well padded upholstering over strong heat-treated springs. The back is concave, with a riser in the center. Cross seats exhibited by Hale & Kilburn include Walkover car seats No. 392 for interurban service. This seat has a deep, double-deck, spring-edge cushion and a divided upholstery effect. No. 108 special bus seat of the cross type has a deep recess in the rear of the back to provide maximum knee space. The back is also cut in on the side, giving a wider aisle. The metal work is pressed steel with an oval pedestal base.

A special type of double motor-coach chair is included in this exhibit.

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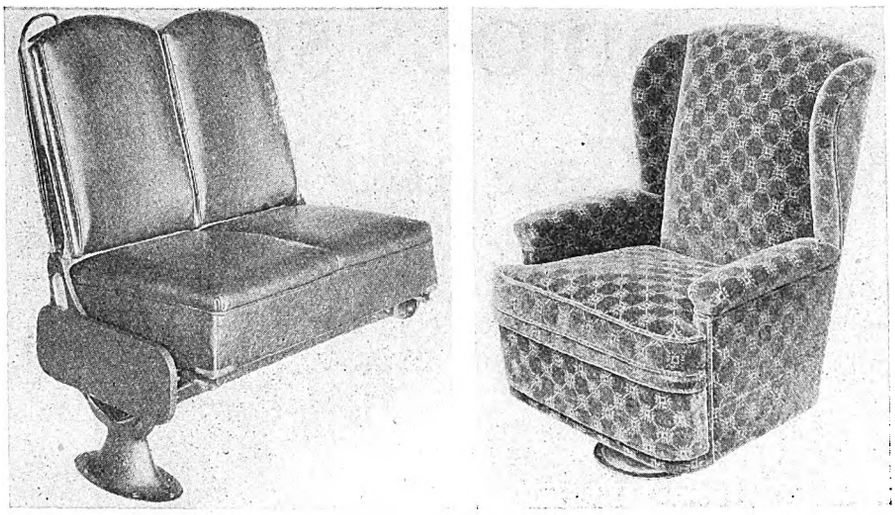

At left, Hale & Kilburn reversible cross-seat, city type. At right, a new Hale & Kilburn parlor car chair for interurban service

The rear back is also recessed and the aisle end of the back is offset to provide additional freedom in movement through the aisle of the bus. Other seats displayed by this company include chairs with light-weight steel supporting mechanism and a number in aluminum.

A number of the latest designs in bus seats are exhibited by the Art Rattan Works. Aside from wicker and fully upholstered parlor car and urban car seats, this company is exhibiting a new type of reclining back seat. This new seat has a simple toggle action, controlled by a short lever on the inside frame of the seat which releases the cams and allows the back to recline about 12 in. from full upright. The back has four positions which are regulated by full release of the lever, allowing the back to follow the passenger from full reclining to upright position by spring action. The back automatically goes to full upright when a passenger leaves the seat.

The frame is of cast, polished aluminum, all bushings being fiber to prevent rattle or metallic noise. A foot rest hinged at the top, lifts up, giving full leg room under the seat, and no cross bars or arms prevent free passage of heater pipes.

Upholstery is full leather, with deep cushion seats and backs.

That the street car and bus patron should have the same comfort while riding as he has in the easy chair at home is a tendency shown in the exhibit of the Sanford Mills. Here are seen for the first time many new developments in mohair upholstery fabrics. Likewise the staple year round grades are included. Due to the marked increase in luxurious bus and electric railway seat building, mohair has come directly to the foreground as one of the most permanent of travel fabrics. Chase Velmo, a fabric woven from the fleece of angora goats, is the leading mohair in this exhibit.

A leather-like upholstery fabric known as Chase Leatherwove is also exhibited by Sanford Mills. Some of the new showings in bus trim include seats with the sides and arms covered in Chase Leatherwove and the back and cushions of Chase Velmo. Adaptability of some of the lighter weights of Leatherwove for trimming within motor coaches or electric cars is also shown. These products are distributed by L. C. Chase Company.

Upholstering leathers for all mediums of transportation are shown in the exhibit by the Cleveland Tanning Company. The Eagle-Ottawa Leather Company shows in its exhibit a number of kinds of leather for motor coach trimming and upholstering. Kelton-Aurand Manufacturing Company shows in its exhibit a line of seating equipment for motor coaches and electric cars.

Radel Leather Manufacturing Company is showing a complete line of upholstery leathers in various colors and designs. Featured in this display are the new Calflyke leathers which are soft and pliable and are in unusual color shades.

Blanchard Brothers & Lane shows results of a new process which makes the leather uniform and insures a product which is especially pliable and of strong fiber.

The divided type backs of this Heywood-Wakefield seat are spring filled

Some of the recent seats developed by Heywood-Wakefield. At left, revolving interurban double chair. Center, double chair of luxurious design. At right, a high-back, all-leather chair built to stand up under hard usage

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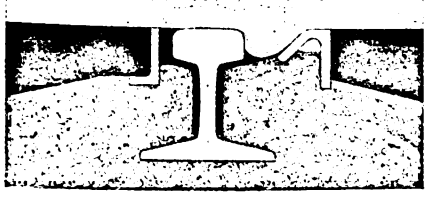
Notable Progress Shown in TRACK MATERIAL and DEVICES

New type of track structure, refinements in design of products of established reputation, and improved apparatus for construction and maintenance work are features of this year's exhibit

OF ALL the many factors involved in electric railway operation, none is more important than track. More than 25 manufacturers are exhibiting track material and equipment at the 47th A.E.R.A. Convention. Numerous new designs are being shown, as well as many refinements in the design of products already well known.

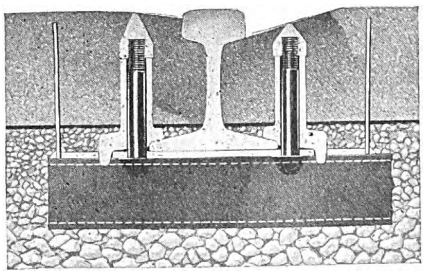
One particular significant development is a type of track structure for use in paved streets. This consists of International twin steel ties laid permanently in a concrete foundation, and equipped with long bolts and rail clips with long sleeves extending almost to the surface of the paving. Vertical steel strips parallel to the rail are welded near the outer ends of the ties. Thus each rail has its own individual paving strip. This rail channel can be excavated easily for putting in new rails by breaking out the pavement around the bolts. The latter are easily located by the lead tops flush with the pavement. Only the rail channel between the steel strips need be excavated, leaving the remainder of the paving intact. with this method of construction, concrete or asphalt can be used in the rail channels for sound deadening regardless of the pavement elsewhere in the street. If a rail works loose in service, it can be tightened down easily without disturbing the surrounding pavement. It is claimed, moreover, that track vibrations are confined to the rail channels and do not affect the adjacent road pavement.



Godwin paving guards are used in this track design to permit employment of low T-rail instead of 7-in. girder rail

Five types of steel twin ties for standard track construction are being shown by the International Steel Tie Company. The exhibit includes also a new heavy duty forged steel rail clip with a wide heel and high tensile strength bolt, as well as hot bent channels for canted type ties.

Another interesting type of track



New type track structure with International twin steel tie permanently imbedded in concrete. Rail clips with long sleeves are held in place by bolts extending upward from tie to paving surface. Vertical steel strips parallel to rail limit amount of paving affected by rail removal or other repairs

structure for paved streets is being exhibited by the W. S. Godwin Company. This involves the use of a low T-rail with the paving on each side strengthened and protected by a straight guard on the outside and a flangeway guard on the inside. This does not necessitate any change in construction below the base of the rail. It makes possible, however, a lessened height from the rail base to the paving surface. It is asserted that a saving of $5,000 per mile can be made in the construction cost of track in paved streets by the use of this method.

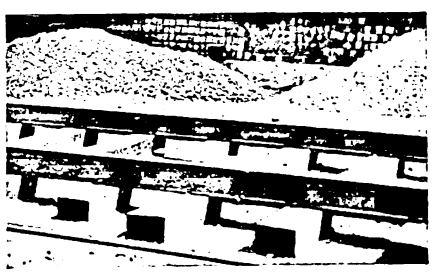
A different type of track structure is being exhibited by the Dayton Mechanical Tie Company. In this design the rail is supported on wood blocks held by the steel cross ties.

Wood ties preserved with ZMA are shown by the Curtin-Howe Corporation. This Zinc Meta-Arsenite preservative was developed by the Western Union Telegraph Company and is the standard material used for treating its pine poles, cross arms, etc. The Bethlehem-Keystone tie is being exhibited by the Bethlehem Steel Company. Elastite rail filler and track pavement are shown in the exhibit of the Philip Carey Company.

Recent developments in special trackwork design are being shown by a number of manufacturers. The Lorain Steel Company has a 200-ft. radius manganese steel tongue switch of the proposed American Electric Railway Engineering Association standard design. This is the first exhibit of a 200-ft. radius switch of this pattern. The same company is showing also a 100-ft. radius manganese steel tongue switch with the Taurman switch lock attached.

William Wharton, Jr. & Company are exhibiting the proposed standard A.E.R.A. tongue switch with 100-ft. radius. The exhibit includes also a solid manganese steel street railway over steam railroad crossing made according to the latest Beggs-Sayre design. Another interesting item is a manganese steel switch point similar to those installed by the Department of City Transit in the Broad Street Subway, Philadelphia. Other exhibitors of special trackwork include the Cleveland Frog & Crossing Company, the Buda Company and the Bethlehem Steel Company.

Rail bonds and bonding appliances feature the exhibit of the American Steel & Wire Company. Continuous



Track structure in which Carey elastite rail filler is used to damp vibrations

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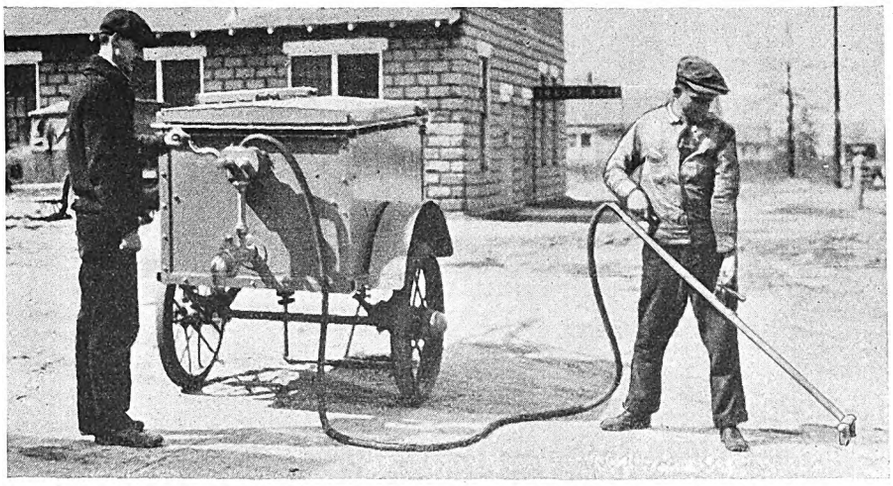

Kerosene-heated tar kettle of the White Manufacturing Company with hand pump and sprayer

joints and special plates of the latest design are being exhibited by the Rail Joint Company. A feature of the line of bonds being shown by the Electric Railway Improvement Company is a new gas weld bond with all-copper terminals for use on high-tension systems. The exhibit of this company also includes interesting welding and brazing equipment. Rail bonds of various types are being shown by the Ohio Brass Company. A tapered rail joint shim designed to remedy low joints is displayed by the American Fork & Hoe Company.

An a.c. and d.c. welder built on the dynamotor principle is being exhibited by the Una Welding & Bonding Company. This is intended for use on 60-cycle three-phase 220- or 440-volt alternating current systems. It is built in 300 and 500-amp. capacities. One of the special advantages claimed for this welder is that it will maintain any set current continuously for several hours. Automatic welding rods, die rods and a coated rod for welding high manganese steel are other features of this exhibit.

Material and equipment for thermit welding rail joints together with a complete layout showing the method of installing welds and examples of completed welds are shown by the Metal & Thermit Corporation.

Feralite rail welding portions complete with all accessories such as sand cores, thimbles, mold boxes, patterns, butt welding clamps, crucibles, etc., are contained in the exhibit of the Feralite Corporation. In addition to this is an interesting preheating apparatus mounted on rubber tires and designed to operate from any 550-volt d.c. power line.

Equipment for the construction and maintenance of track is shown in large variety. Based on field tests made after the last A.E.R.A. convention, the model A compression tamping machine, built by the International Steel Tie Company, has been carefully redesigned. The new machine has 19-in. standard electric railway wheels and a mechanism to raise and lower the two sets of tamping arms. The rack and pinion gear which does the lifting also provides for adjusting the tamping arms for rails from 5 in. to 7 in. height. The drive is from a 2-hp. 550 to 600-volt d.c. motor by means of a completely inclosed worm reduction gear running in oil. The machine is propelled along the track by means of a hand-operated chain drive to the rear axle. The latest model DSR track layer, a one-man machine for fastening twin steel ties to the rails, is also being shown by the same company.

Oil burning torches, tar kettles, concrete mixer heaters and switch heaters are being shown by the White Manufacturing Company. The tar kettles are equipped with self-generating vaporizing kerosene burners, which produce sufficient heat to make pouring possible a few minutes after lighting. These kettles are supplied with a hand circulating pump and sprayer.

Track greasing device designed by the Railway Track-work Company

An innovation in track department apparatus is a machine for greasing the rail. This device is made by the Railway Track-work Company. It consists of a pair of wheels, which follow the rail, a tank for the lubricant, and a handle to guide and operate the machine. A hand pump is provided to furnish pressure to force oil through the feed pipe and brush to the guard rail. The same company is also exhibiting reciprocating track grinders, the Eureka radial rail grinder, the Vulcan rail grinder, an improved Atlas rail grinder and the Ajax electric arc welder.

Miniature track spraying equipment is shown by the Reade Manufacturing Company, featuring its non-poisonous weed killer.

Dump cars and dump trucks are on display by the Differential Steel Car Company. Another item of this exhibit is the Clark concrete breaker.

An actual demonstration of a switch point being thrown electrically by the latest type Cheatham switch is the outstanding feature of the exhibit of this company. Improved and shorter type ground boxes, patented spring holding mechanisms, an improved circuit changer with or without locking attachment to prevent splitting of switch points, and an improved lightweight contactor are also shown.

The Nachod & United States Signal Company has a variety of signals on display. Among the new items in this exhibit are an annunciator signal, a turn-right signal, and a highway crossing signal with single-track car counting, or non-car counting control. Models of other signals are also shown, as well as headway recorders, flasher relays and overhead trolley contactors. The Union Switch & Signal Company is showing automatic block signals controlled by alternating-current track circuits.

Noiseless rail fastenings are a new development being exhibited by the Chase Appliance Corporation. These are designed particularly for use with steel ties. Two shaped blocks are welded to the tie, one on each side of the rail. Wedges shaped to fit the inside of the blocks and the fishing surface and base of the rail, are then inserted between the blocks and the rail. Other devices in this company's exhibit include silencers, rail insulators, and anchor tie plates.

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New Things in POWER and LINE EQUIPMENT

Numerous improvements in line materials have been made. Latest designs in supervisory and power apparatus are shown in the exhibits

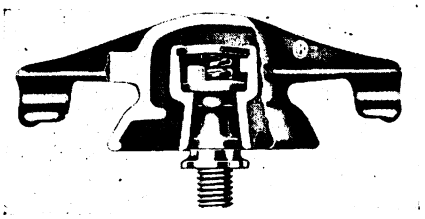
SEVERAL improvements in line apparatus have been made during the past year. Hangers have been made stronger, trolley ears have been made lighter and more durable, trolley frogs have been materially improved and outstanding changes have been made in insulator materials and design.

A departure from the usual practice of constructing trolley ears has been followed by the Westinghouse Electric & Manufacturing Company in producing the Champion ear. An alloy web and boss is die cast or hot molded on a runner punched and shaped from sheet bronze. With this it has been possible to obtain lips of uniform thickness and high conductivity. It is also lighter and is said to reduce arcing materially, with the result that it will outlast former types of ears.

The Scott ear is also a new design made by this company. As the trolley wheel comes in contact with the approaches at either end it travels on flanges constructed along each side of the ear. Thus the wheel does not ride the lips at any time. The life of the ear is thus considerably lengthened.

A new Westinghouse aligning trolley ear suspension is so constructed that the body which supports the ear is free to rotate while the yoke remains fixed to the cross span wires. This permits the ear to be in exact alignment with the trolley wire. A new molded material is used to hold the stud in the body of the suspension.

In a lock hanger made by the Ohio Brass Company there is always a tight joint between hanger and ear without the use of shims or other devices outside of the hanger itself. The ear is screwed on to the stud until it makes contact with the hanger and then is screwed still farther in the same direction until it lines up with the trolley ear. This is provided for by the limited vertical movement of the thread against a heavy spring inside of the hanger. The mechanism inside the hanger is materially



The joint is always tight between the hanger and the ear of this O-B lock hanger

stronger and there is a longer leakage path between the stud and the shell.

A new O-B duplex trolley frog with a renewable body has an overlapping runner suitable for any degree of turnout and a detachable suspension yoke and clamp which hold the trolley wire in a fixed position in the span independently of the frog body or pan. The suspension yoke and clamp becomes a permanent part of the overhead line. The body only is replaced when necessary. Quick replacement is made without disturbing the supporting span or trolley wire, and without losing the exact location of the frog being removed. This eliminates the necessity of adjustment. The suspension yoke of this trolley frog is supported by a cross span wire, for which two eyes are provided. To the yoke is bolted the clamp which holds both trolley wires in relative positions. The frog body or pan is in turn attached to the yoke by two bolts. Only the two bolts and the cam tips are removed when replacing the frog, the yoke and trolley wires remaining in position. The current is collected in the groove of the trolley wheel and not on the flanges. The frog body and suspension are made of Flecto malleable iron, hot-dip galvanized. The same yoke is suitable for both right and left hand frogs.

This Westinghouse Champion trolley car is light and materially reduces arcing

A new secondary rack is shown by the Oliver Iron & Steel Corporation. Its back is of one piece of rolled open-hearth steel, while the points are drop forged. The design of the back eliminates the need for washers under the bolt heads when mounting. The point is so arranged as to eliminate scoring of the line wires during their installation. All small parts are eliminated, thus giving greater resistance to rust.

A new cap and cone type insulator is shown by the Westinghouse Electric & Manufacturing Company. It is claimed that it will not chip or crack when handled by tools for installing, is not damaged when accidently dropped from the tower car, is not affected by heat and because a phenolic-resin binder is used in manufacturing, it does not absorb moisture and soften under intense heat. This company also shows various pin type porcelain insulators for use on 6,600, 11,000, 13,500, and 45,000-volt systems, also suspension type insulators for high voltage and several types of strain insulators for high voltage use.

A new feeder dead end clamp assembly for use with low voltage feeder cables, concentric or rope lay, of any size between 500,000 and 1,000,000 c.m. has been developed by the Ohio Brass Company. Its compactness permits installation from the pole, making use of ladders or staging unnecessary. The feeder cable may be cut off and dead ended in the clamp, or carried through for proper connection to another feeder, either below or on either side, or above the clamp. The clamp clevis is in line with the center of the cable. This permits a straight pull from the feeder to the pole or other structure and avoids any kinking or bending of the cable under strain. The insulator assembly of this clamp consists of two interlocked wet ware porcelain insulators, an eye fitting for attachment for clevis of clamp, an intermediate fitting between the insulators, and a clevis fitting for attachment to eyebolt in supporting structures. The clamp and fittings are of Flecto malleable

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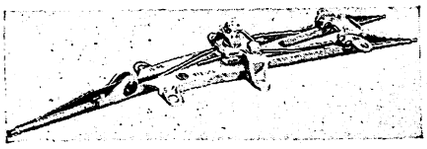


A renewable body is the feature of this duplex trolley frog made by the Ohio Brass Company

iron, hot-dip galvanized. The saddles are of bronze. The ultimate strength of the clamp exceeds 12,000 lb. Other new devices which are exhibited by the Ohio Brass Company are a renewable under run section insulator, spangrip clamps and lashings and new pole sleeves.

Catenary overhead materials furnished the Boston, Revere Beach & Lynn Railroad are included in the exhibit of the General Electric Company. The special feature of this material is that the castings are nonferrous. In addition, there is an exhibit of standard line material.

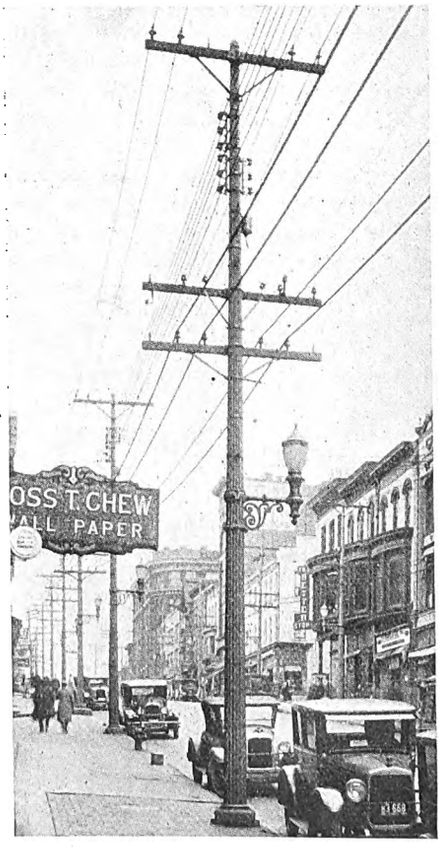
A new method of connecting composite cable is featured by the American Brass Company. A strong large cable of four layers is used, the first and second layers consisting of nineteen wires of Calsun bronze, and the third and fourth layers comprising 42 wires of Anaconda hard-drawn copper. The individual wires have a diameter of 0.1245 in. The weight of the complete cable is 2,920 lb. per 1,000 ft., its maximum breaking strength, 57,000 lb., and the outside diameter 1.121 in.

Two inner tubes are swaged together in the form of a double tube connector. This double tube connector is drawn on to the inner layers in one operation by a single die. The outer tube is drawn over the double tube connector, and also over the third and fourth layers. These Anaconda seamless connectors of the double tube or single tube variety may also be used on smaller composite cables.

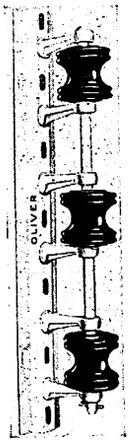
Anaconda preformed cable is another feature of this exhibit. The individual wires are formed into a helix prior to being stranded together. As a result the wires do not unravel or fly apart when the cable is cut. This is of special advantage when high-tempered alloy wires are made into messenger cables used for guying poles, or for cross spans on trolley lines and in the electrification of railroads. For such purposes the cable is cut into comparatively short lengths, and the stringy strands would fly apart unless tightly bound before cutting. The elimination of binding saves trouble and expense during installation. Anaconda hollow conductors and composite cable are other features of this company's exhibit.

The Okonite Company exhibits samples of rubber-covered and varnished cambric insulated wire and cable, friction and rubber insulating tapes and Okocord. A new process makes it possible to buy Okocord with the name or initials of any railroad molded into every foot, which positively identifies the property. The Okonite-Callendar Cable Company is exhibiting samples of impregnated paper and super-tension cables, splicing materials, junction boxes and splices.

Various types of fluted steel poles are featured by the Union Metal Manufacturing Company. These poles are of particular value in cities where beautiful appearance makes them a ready means of building good will. The shafts of these poles are fabricated from heavy open-hearth deep-drawn stock steel. There are no horizontal joints or splicings. The bottom end of the shaft is flanged with the flange extending under four foundation nuts. These poles are set directly on a concrete foundation, and secured by heavy anchor bolts. For ornamentation and additional protection against corrosion an ornamental heavy steel casting is used as a base. Removal of the screw holding one of the four ornamental leaves in position gives immediate access to the foundation bolts. Ventilation through the poles is provided by the base, thus eliminating inside condensation or sweating. Due to the foundation method of setting these poles it is a very easy matter to line up the poles after the loading has been applied, thus assuring positive alignment at all times.



On these Union Metal poles in Wheeling, W. Va., are mounted all of the wires formerly supported on several sets of poles, as well as the ornamental lighting system



A new rolled steel one-piece back and drop-forged points are combined in this secondary rack made by the Oliver Iron & Steel Corporation

An earth boring machine and pole setter is offered by the Highway Trailer Company. It is claimed that this machine will traverse and operate in thick underbrush, in ditches, knolls, hollows, embankments, and require no skids. It reaches and digs, as well as sets the pole in any kind of soil. In addition to digging straight holes it will dig at any angle suitable for all types of anchors. In actual line construction work an average of a pole in the ground every 5½ minutes is the record recently established by this highway earth boring machine. The feasibility of setting the pole at the time the hole is dug, also the possibility of dragging the pole to a position so it can be hoisted, is possible by using the cable from the winch which is controlled from the driver's seat. The winch is driven from the power take-off. The pole derrick of this machine is 17 ft. in length, and made of 3½-in. diameter 40-carbon seamless steel tubing, and is capable of setting poles 45 ft. long. The boring machine is largely used with a 20-in. auger, but is capable of handling augers from 8 in. to 24 in., the latter under favorable conditions.

A complete line of poles, line hardware, and construction specialties are

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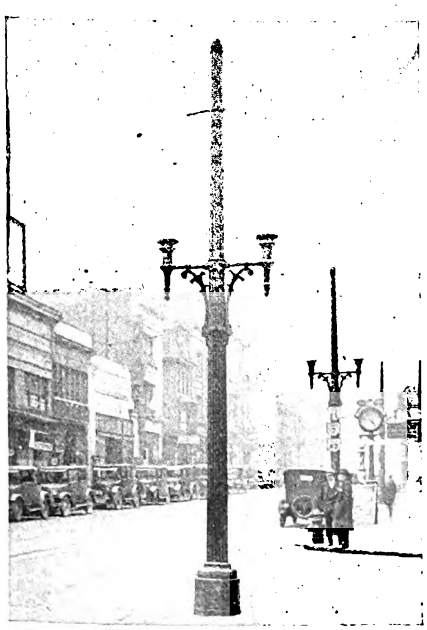
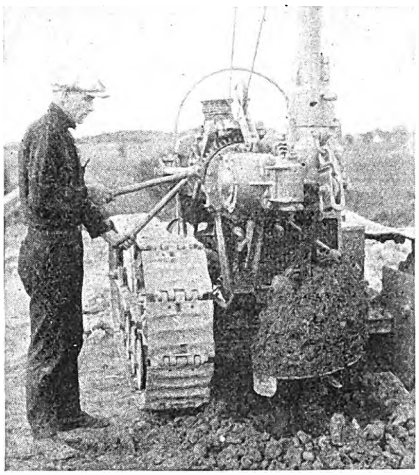
featured in the exhibit of the Oliver Iron & Steel Corporation. All line material is galvanized by the new exclusive Fassinger process of double dip hot galvanizing. This process gives a bright finish, uniform coating with no spelter to clutter up threads, great resistance to rust, and longer life. This exhibit includes anchors, anchor rods, braces, brackets, clevises, pins, and cross arm straps.

A cross section of a type LV autovalve lightning arrester is shown in the exhibit of the Westinghouse Electric & Manufacturing Company. This is an inexpensive arrester that gives protection and yet is light in weight and easy to install. It requires practically no attention after being installed, and furthermore, when something goes wrong the arrester will disconnect itself from the line. Permanence of the arrester element and housing is assured by a porcelain casing.

Supervisory equipment of the synchronous selector type is exhibited by the General Electric Company. This equipment provides a means of the control of various types of switching equipment at remote points, gives visible indication of the position of these devices, and draws attention immediately to any change in the status of the controlled apparatus. Its chief advantage is the co-ordination of any number of units under central supervision. This system is normally at rest. Any impulse either to actuate a device or to report an operation starts a sequence which is continued



These Union Metal fluted steel poles installed in Steubenville, Ohio, support traffic lights, the trolley line and the ornamental lighting system



This earth boring machine and pole setter made by the Highway Trailer Company digs holes in any soil or location

until the action is completed and the proper indication given, after which the equipment returns to its starting position ready for the next operation.

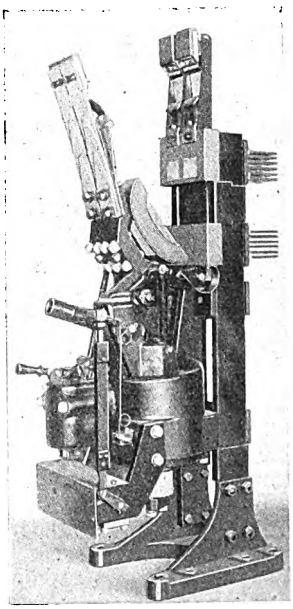
This supervisory system has been designed to operate over four wires extending between the dispatcher's office and each outlying station. In the exhibit this supervisory control has been arranged to operate a rectified current type of telemetering equipment arranged for selective reading of four current values, an MC-2 air circuit breakers, an FKR-55 oil circuit breaker, an RK-6 disconnecting switch and a JR-25 high-speed breaker.

Rectified current telemetering is a simple system for transmitting the readings of alternating current or voltage for a considerable distance over telephone lines, or supervisory control wires, without interfering with the use of the lines for other purposes. The alternating current or voltage is transformed to a suitable value, rectified to direct current, and transmitted over the line to be read by a milliammeter which is calibrated in terms of the alternating current or voltage which is to be read. The readings may be continuous, or as in this exhibit, transmitted by the supervisory equipment as desired.

The MC-2 air circuit breaker is a panel-mounted solenoid operated interrupting device. It is different from the ordinary switchboard breaker in that it is provided with an arc chute with blowout coil and metal arcing tips. Due to the light moving element, the heavy contact pressure used, and the efficient arc chute and blowout coil, it is said that this breaker is about four times as fast as an ordinary panel-mounted carbon arcing tip breaker. It may be arranged to trip on direct overload, rate of current rise, or a combination of both.

A complete new line of 7,500 and 15,000-volt 400 to 3,000-amp. high interrupting capacity indoor oil circuit breakers for moderate and heavy duty service at any altitude is formed in the type FKR-55. The essential features of these circuit breakers are the enclosing of three phases in a single sturdy, round tank, the positive alignment of all moving parts, and simple, compact construction which permits easy installation, inspection and maintenance.

A distinct advance in design of direct-current high-speed circuit breakers is made in the General Electris JR-25 high-speed breaker. Due to its high speed it affords protection



This Westinghouse carbon circuit breaker has been designed to meet the requirements of automatic and semi-automatic substations

to commutating apparatus, which has made possible many radical improvements in direct current switching. The breaker is self-contained and may be closed either electrically or pneumatically. It is held closed magnetically against the action of powerful springs. The breaker is tripped by the direct action of load current which reduces the holding flux. An additional feature is that the tripping circuits are so arranged that a lower value of tripping is obtained on rapid rates of current increase than with slowly increasing currents. The breaker is also trip free when closing against a short circuit or overload.

Two types of circuit breakers for

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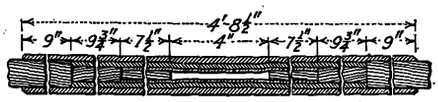
railway substations are exhibited by the Westinghouse Electric & Manufacturing Company. The type HS high-speed breaker is an air break switch of the contactor type. It is designed with a movable contact of solid copper bridging two stationary contacts and held closed by an electromagnet. When protecting conversion equipment in railway substations, it is connected in the machine circuit and differentiates between legitimate overloads and short circuits, provided the holding in coil of the breaker is excited from some force of fairly constant potential, preferably the machine terminals. The opening of the high-speed breaker keeps the current within the commutating capacity of the machine by cutting in resistance.

The transformer used in this Westinghouse oil testing outfit is of the three-legged cross type

The widely increasing use of automatic and semi-automatic substations has brought the need of a circuit breaker that is stronger mechanically and that will interrupt large overloads a greater number of times and still be in condition to carry a load without overheating or be in need of repairs or cleaning than any previous type of circuit breaker. These characteristics are embodied in the design and construction of the type CH carbon circuit breaker exhibited in the Westinghouse booth.

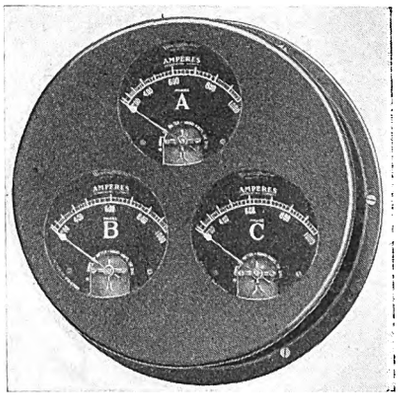
This breaker is mechanically trip free from the closing magnet or closing handle. A wide opening between arcing contacts, its high interrupting capacity, freedom from expansion for arc gases, pedestal or panel mounting, and a mechanically free trip are its distinctive features.



Sectional drawing showing the manner in which Anaconda seamless connector is applied to composite cable in making a splice

The difference in voltage and power conditions on the lines of the Cincinnati Street Railway brought about by the installation of nineteen automatic substations is shown on a map of the system by means of a miniature train and lamps in the exhibit of the Collier Construction Company.

Westinghouse is showing three types of indoor current transformers. Type KO, with a rated voltage of 4,600 volts, has a single watthour meter burden, and for higher meter burdens up to 12½ volt-amperes. A higher-degree of accuracy than with ordinary current transformers is obtained in the NA transformer, rated at 7,500 volts, due to the use of a new steel, Hipernick, in place of the usual silicon steel. Hipernick is non-aging, and therefore there is no change in the characteristics of the transformer over a period of time. The type KB current transformer shown is similar to the type KA, except that it is insulated for service up to 15,000 volts.

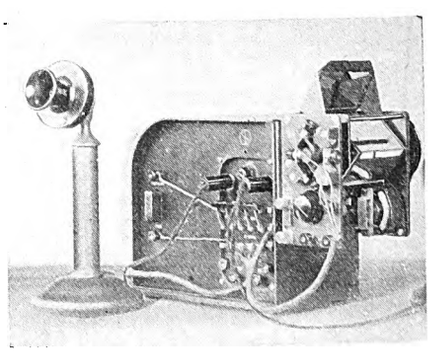


Triplex instruments arranged by Westinghouse for use on three-phase circuits indicate the load on each phase

The plug type current transformer shown is rated at a primary current which gives 5 amp. secondary. It is compensated for 12½ volt-amperes load at 5 amp. secondary. The coils in the primary can be connected in either series or parallel or in series-parallel by means of connecting plugs in order to obtain a suitable ratio. The transformer is insulated for use on 2,300-volt circuits and is contained in a covered wooden case with handle.

A portable oil testing outfit has been made by Westinghouse for use in periodically testing oils of electric equipment in outlying districts where a more elaborate testing outfit is not justified and eliminates the necessity of sending samples to a centralized laboratory. This set consists of a small testing transformer enclosed in a cast aluminum case, covered by a micarta panel which carries the voltmeter and control equipment. Two high-voltage bushings are brought through the panel and form the support for the oil testing cup. The voltmeter in the panel, which is calibrated in kilovolts, indicates the breakdown value of the oil.

Westinghouse is showing a complete line of a.c. and d.c. instruments for general testing purposes, including typical portable volt-ammeters, volt meters, ammeters and wattmeters. One of the features of this exhibit is triplex instruments arranged with three dials for use on three-phase circuits to indicate the load on each phase, or the voltage between the ground and the lines. By means of an instrument named the Osiso, a visible reproduction of an invisible phenomena is made possible. The novel arrangement of this practical mechanism actually shows how the voice looks when a person talks. It demonstrates how it is possible to see the invisible current chasing an unseen voltage in an electrical circuit. This portable instrument is valuable for recording system stability during a chance disturbance, and for other studies in connection with the power system.



The Westinghouse Osiso is a valuable portable instrument for recording system stability and for making studies of power systems

The Aluminum Company of America is exhibiting aluminum and its strong alloys in semi-fabricated condition and as fabricated by other concerns. The use of aluminum for bus bars is one of the many features.

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News of the Industry

Preparing for 7-Cent Fare in Los Angeles

The Los Angeles Railway Corporation, Los Angeles, Cal., has taken steps to put into effect by Sept. 22 the temporary 7-cent rate allowed by a recent federal court decision. Coupons are to be issued to passengers which may be redeemed for the difference between the advanced fare and the present 5-cent fare in the event the city and state succeed in having the temporary 7-cent fare voided. They have set in motion legal machinery necessary to block this rise.

Under the federal court decision the company is permitted to charge 7 cents for a single fare with four single fare tokens for 25 cents and free transfers and half fares for the school children. The federal court has just enjoined the State Railroad Commission from enforcing a recent order denying the railway company's petition for the proposed increase in its rates.

The first move for an increase was made in 1921. The commission steadfastly refused to grant the increase and the company started injunction proceedings in the federal court early in 1928, contending that the refusal for permission to increase the fare to 7 cents was tantamount to confiscation of the property. Attorneys for the railway told the federal judges that the company was operated at a loss of approximately $7,000 a day and was indebted to the Henry E. Huntington estate in the sum of $9,000,000 for moneys advanced by Mr. Huntington.

By unanimous vote the Los Angeles City Council has requested City Attorney Jess E. Stephens to appeal to the United States Supreme Court from the injunction restraining the commission from interfering with the proposal of the 7-cent rate asked by the railway. The appeal, which will be made by the city and state authorities, will be based upon the corporation's contract with the city which guarantees a 5-cent fare and upon the assumption that the only body that has jurisdiction to set aside the guarantee is the California Railroad Commission.

No Stay in Baltimore's Depreciation Case

The Maryland Publice Service Commission has been refused in its plea for a stay in rehearing the depreciation issue affecting the United Railways & Electric Company, Baltimore. The case was heard by Justice Brandeis of the United States Supreme Court. He held that the commission should hear the case, in compliance with the decision of the Maryland Court of Appeals. This portion of the case was remanded by the Maryland Court holding that the commission should have based the annual depreciation allowance for the company on the present value of its property instead of the cost of this property. The United claims a $2,200,000 annual depreciation allowance. In its original decision granting a fare increase from 7½ cents to 8⅓ cents the Public Service Commission allowed a depreciation reserve of only $883,000.

Nov. 15 has been set by the commission as the date to open hearings on the disputed point. In the meantime H. Carl Wolf, chief engineer of the commission, is making a survey of the company's property in order to have the figures ready by the time the hearing opens.

Increases on Certain New York State Lines

Authorization was given the New York State Railways on Sept. 12 to make certain increases in its various fare rates connecting Forest Park, East Utica city line and Little Falls. The rates are to remain in effect until Nov. 1, 1929, and thereafter until otherwise ordered by the commission. According to the order the company may sell strips of ten tickets for 75 cents for transportation between points in any two connecting zones between stops 11 and 36. Further provision is made for round-trip tickets and one-way cash fares.

A memorandum by Commissioner Brewster and approved by the commission stated it was clear from the evidence that the petitioner was not earning an adequate return on the value of its property. A return of less than 7 per cent on $1,000,000 of valuation was realized in 1927. Even allowing the contention of the communities that no depreciation should be charged against income the return would still be inadequate on any possible valuation.

Big Crowd in Broad Street Tube

THE number of passengers carried on the new Broad Street subway, Philadelphia, totaled 564,460 in the first week of operation, Chairman Ainey, of the Public Service Commission, announced on Sept. 16. The number includes all riders—cash fares, tokens, exchanges and free transfers.

The peak load of the week was carried on Saturday, Sept. 8, when 101,110 passengers used the subway. On the first day, Sunday, Sept. 2, the number was 62,507.

Golden Brown Favored in Color-Conscious Nebraska

In a local beauty contest which elicited 35,000 opinions on color design the "Nebraska" obliterated its competitors and established itself among the residents of Omaha and Council Bluffs as mechanically reliable and esthetically satisfying. Down to defeat went the "Fontenelle" of pigskin brown body, light cream sash and gray roof; "Ak-Sar-Ben" of green body, yellow sashes and red roof; "American Legion," red body, white sashes and blue roof, and the "Omaha," the present yellow car now in use. As a result of the majority vote in favor of "Nebraska" all cars of the Omaha & Council Bluffs Street Railway will strut a golden-brown body, cream sashes and gray roof. While the cars are gradually being repainted, they will also be equipped with modernized safety devices.

The public as a jury had been inspecting the four new color designs during the summer when the cars ran for several days at a time on every Omaha line, first for exhibition purposes and later in regular passenger service. The four competing cars were reconditioned in the car shops and, besides the color changes, featured a number of safety and convenience devices such as sun visors for motormen, automatic safety stops and automatic air gongs.

The street car color vote is just another step in the company's policy to take the public into its confidence, manifested recently when the skip-stop election was held. However, 10,000 more registered their ballots on the color question than on the former question.

This program, stimulating good feeling for the local management, has been projected by J. N. Shannahan, who went to Omaha from Newport News, Va., several months ago and has already done much to sell street car service as a commodity essential to the life of the city. He not only changed the token rate from six for 40 cents to a basis of three for 20 cents, but he even made the token "smile" at the buyer. So "Service with a Smile" became more than a slogan. Recently in *Street Car Topics*, the company pamphlet, the railway pledged to continue to be governed by the car riders' wishes in giving ample and efficient service in the two cities.

New York & Queens Hearing to Be Continued

The hearing on the application of the New York & Queens County Railway for a 7-cent fare on its so-called Steinway line will be continued Sept. 24, an adjournment having been taken by Transit Commissioner Leon G. Godley

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to allow both the railroad attorneys and the city to submit memoranda on the case. Michael J. Shugrue, Commissioner of Public Works in Queens, represented Borough President Patten at the hearing, and voiced opposition to the application. Mr. Shugrue asked that the hearing be adjourned so that Mr. Patten might have a chance to appear personally to oppose the higher fare move, but Commissioner Godley told him that the hearings would last long enough for the borough president to have ample opportunity to be heard.

Joseph A. Devery, assistant corporation counsel, claimed the commission lacked jurisdiction in the fare question.

Increased Service Sought in Southeast Kansas City

An appeal has been made to Powell C. Groner, president of the Kansas City Public Service Company, for increased service in the southeast section of Kansas City, Mo. According to W. H. Launder, president of the South Troost Development Association, 90 per cent of the residents of this section are small home owners or renters, and are present or future street car patrons. They request additional railway service and a bus line which would connect with four other lines.

Higher Fare on New Jersey Line

Application of the Cumberland Traction Company, Millville, N. J., to increase its fare from 7 cents a zone or four tickets for 25 cents to 10 cents a zone or three tickets for 25 cents has been approved by the New Jersey Board of Public Utility Commissioners. The increase carries with it a decrease of from five to four in the number of zones between Bridgeton and Millville, where the company operates. In asking for the increase it was contended that the company never had paid a dividend and that there was an accumulation of current bills amounting to $19,000 which could not be met except from an increase in operating revenue.

Oklahoma Employees Called It a Joy Ride

Passengers boarding Oklahoma Railway cars and buses in Oklahoma City, on Sept. 13 found lids on the fare boxes and were handed a card. One side said: "Good Morning! No fares collected this trip. Your ride is with the compliments of Rorabaugh-Browns, whose thirteenth anniversary celebration begins today. Be sure to drop in and see Oklahoma's greatest store in action." The reverse side of the ticket read: "The value of our service to you as a shopping convenience is increasing daily —it pays to save. Ride the street cars and buses. You will save the difference. Oklahoma Railway, H. R. Hudson, president."

Trainmen said the smiles of the public made each trip a sure-enough joy ride.

Something New in Outdoor Advertising by North Shore Line

An attractive innovation in outdoor advertising has been introduced by the Chicago, North Shore & Milwaukee Railroad, which has erected at important traffic points on its lines artistic statues as a medium for carrying its message of service to the public.

These statues present the figure of a town crier of early American days striding along with a bell in one hand and a scroll in the other. On the scroll are inscribed in large letters the words:

Town crier has new calling

"Did you ever travel 80 miles an hour?" —emphasizing the high-speed operation of all-steel North Shore Line trains between Chicago and Milwaukee. The figure of the town crier is 7½ ft. and appears to be carved out of marble. It stands on a 7-ft. base, which is finished to represent light gray granite. On the four sides of the base are large North Shore Line emblems in bas-relief, and placques telling of the territory and leading communities served. The statues are constructed of a solid composition that will withstand the elements.

Ten of these statues are being erected by the North Shore Line, and eight are already completed. The accompanying illustration shows the statue at Briergate Station on the Skokie Valley Route.

Traffic Survey for Cincinnati Suggested and Approved

The Cincinnati Chamber of Commerce approved a majority report of its rapid transit committee on Sept. 12 calling for a comprehensive survey of the entire traffic of the city, including study of a project for a downtown underground belt line or loop to serve the congested area and to relieve heavy traffic.

The report was written by John Weld Peck, former U. S. district judge; Charles A. Bosworth, local bank president, and Charles J. Nelson, wholesale jeweler. They found the future success of a rapid transit system in Cincinnati "uncertain." They said:

> The margin between success and failure as disclosed by the Beeler report (an earlier survey) is so narrow that your committee is unwilling to advocate the expenditure of $13,000,000 additional necessary to complete the system and carry it through the first five years of operation, until there has been a complete study not only of the proposed route but also of the entire city by a disinterested local engineering board. In the meanwhile, no substantial loss is incurred by allowing the work to stand as it is.

The committee commended the Rapid Transit Commission for having provided a boulevard to Brighton, a suburb, over the tube that is ready for the rails, and urged its extension.

In his minority report D. C. Keller recommended prompt completion of the system in accordance with the Beeler report. Another survey would result in more disagreement among experts. Any new rapid transit project could not be expected to be profitable at once. Traffic comes only from opportunity.

The Chamber of Commerce committee has been at work several months studying the feasibility of completing the system. A score of hearings have been held at which city officials, railway experts and interested citizens advanced their views.

Seattle Survey on Paving Problem

Demanding that immediate action be taken by the City Council on the problem of paving between the tracks of the Seattle Municipal Railway, Seattle, Wash., community club leaders in the city, backed by the Seattle *Daily Times*, have appealed to Mayor Frank Edwards for help. The Mayor has announced that he will immediately order a survey to determine how the pavement may be financed, and also to hasten its beginning. There are miles of unpaved street car trackage all over the city. Mayor Edwards calls attention to the fact that the railway system, held responsible for this paving, has not the funds with which to do it, but declares that "this must not deter the city from seeing that it is done."

Two widely different but almost equally definite plans have been offered. Robert B. Hesketh, president of the City Council, advocates completion of the paving at the expense of the city's general fund. Roy E. Furse, assistant superintendent of the Seattle Municipal Railway, declared that if the City Council would authorize a sufficient bond issue for rehabilitation of the railway system and Seattle citizens would buy the bonds the street cars would soon pay their own share of the paving. He declared that with a bond issue of $4,000,000, the entire Seattle street railway system can be put on a well-paying modern service basis, and be enabled to handle its share so that at least a majority of this unfinished paving could be completed.

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More Parking Plans Under Consideration in Chicago

Further relief from traffic congestion in downtown Chicago, Ill., is contemplated in a plan now being considered by the City Council committee on traffic regulation which would bar all motor trucks from the Loop district between 4:30 and 6 p.m. daily except Sunday. According to sponsors of the project, it will not be accomplished by legislation, but by inducing transfer companies and other large truck operators to arrange delivery schedules which will eliminate the necessity of their trucks being in the Loop during the evening rush hours.

A no-parking ordinance has been in effect in the downtown district since Jan. 10.

Counting School Rides in Baltimore

School pupils in Baltimore, Md., will take more than 3,500,000 5-cent car rides during the present school year, according to the United Railways & Electric Company. The company sells the 5-cent fare tokens for pupils between the ages of twelve and twenty years who attend public, private, parochial and night schools. In the last school year, according to the United, the day school pupils took a total of 3,613,577 of these 5-cent rides and 71,852 were taken by pupils of night schools.

Would Have Subways Handle New York Mails

The planning and research committee of the postal service, of which Joseph Stewart is chairman, probably will take up with postal officials in New York City the question of using the train service of the Interborough Rapid Transit Company for the transportation of mails, it was stated orally at the Post Office Department recently.

This committee was recently appointed by the Postmaster General, Harry S. New, to study improvements in the postal service. The committee has no program mapped out for it, but the statement was made that because of congestion of traffic in New York City, the postal service must find other means than those at present in use for transporting its mails. While he was Second Assistant Postmaster General, Mr. Stewart had this question up with New York postal officials, but no progress was made toward obtaining a mail contract with the companies operating subway train service.

According to some members of the committee, the department should renew negotiations for a new system of transporting mails in New York City. The committee has in mind a plan for the construction of its own subway system in New York City, but because of the great cost it is more than likely that its plan will be abandoned, it was said. The committee, however, is going ahead with its plans for increasing its mail facilities in New York City and no doubt will attempt to make a contract for the carrying of mails on the subway routes, it was stated.

New Decoration for St. Louis Cars

A new monogram to take the place of the two-letter combination used by the United Railways, the predecessor to the St. Louis Public Service Company, St. Louis, Mo., is now being placed on all cars in service. The company called upon the artists and student artists in the Art School of Washington University to enter a contest to produce the new monogram. Following the announcement of the awards the management adopted the design submitted by Miss Grace Nelson, shown in the accompanying picture. However, Miss Nelson did not win the first prize. That was won by Miss Florence Boeffer. Both received the same reward of $75. Under the rules of the contest the management reserved the right to make the final selection regardless of the prize winners agreed on by a contest committee. Thus the management after the first, second and third prize winners were named by the committee gave preference to the Nelson drawing as the one best suited to its purpose. The names of the prize winners, accompanied by a reproduction of the Boeffer design, were published in the March 31 issue.

Cars in St. Louis carry this decoration

Further Discontinuance Pleas of New York State Railways

A hearing was held before the Public Service Commission on Sept. 4, on the application of New York State Railways for consent to the further discontinuance of the operation of its cars upon a portion of its Auburn Avenue shuttle car line in Utica, N. Y. Discontinuance of this operation has been permitted for temporary periods heretofore and the present request is for an extension of the non-operation period to July 1, 1929. The territory covered by the application is now being served by a bus line of the Utica Railways Co-ordinated Bus Line, Inc.

A public hearing will be held on the application of the New York State Railways for permission to discontinue the operation of cars on its railroad in North James Street in the city of Rome until Sept. 1, 1929. Temporary discontinuance of this service to Sept. 1, 1928, was authorized. Bus service is now being furnished by the Utica Railways Co-ordinated Bus Line. Inc.

Chicago Report Expected Oct. 1

Michael J. Faherty, president of the board of local improvements at Chicago, Ill., has announced that the committee of engineers and architects that has been working out a general scheme for a subway would submit its report about Oct. 1. Thus Mr. Faherty hopes to be able to have the other committees begin work immediately afterward, so that the detailed plans may be ready within the following three months. The board of local improvements will then hold public hearings and begin the spreading of assessment rolls.

Ernest R. Graham, architect, is the chairman of the committee that was named at a conference in the offices of the Chicago Plan Commission several weeks ago.

Ban on One-Man Cars in Oakland to Be Reconsidered

Postponement of reconsideration of the one-man car ordinance, defeated at final passage recently, was voted by the Oakland City Council, Oakland, Cal., on Aug. 24 over the opposition of Mayor John L. Davie. Reconsideration of the ordinance, which would permit operation of one-man street cars by the Key System Transit Company, is to come before the Council.

Eugene K. Sturgis, commissioner of revenue and finance of the city, who proposed the ordinance, told the Council:

There seems to be considerable misapprehension as to the purpose of this ordinance. The effect will be to increase the number of cars operating and increase the service on certain lines without additional cost and thereby gain additional passengers and revenues for the company. The purpose is not to lay off men. I was and am in favor of this ordinance because I believe it will make for better service to the people of this city, because practically every large city in the country has such type of service and because I do not believe in a receivership which will foreclose a large number of small stockholders to the benefit of a few large bondholders and to the further benefit of large fees to a few receivers.

Among a series of questions which the company answered was the following: Will a permanent solution of the financial problem of the Key System result from the operation of one-man cars?

It replied:

Such operation will be a very large step toward a permanent solution. It is in the opinion of the present management extremely desirable that permanent, and hence necessarily sound, solution should be found.

The present management has evolved a program (in which one-man car operation is an important step) which it believes will be a permanent solution. It therefore asks an opportunity to demonstrate the effectiveness of this program.

Experience has shown that the solution furnished by bankruptcy and the wiping out of securities is not permanent, is unjust to innocent investors, and would deter the investment of new capital in these communities.

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Talk of Maine Project Revived

Events which have been the subject of record previously in ELECTRIC RAILWAY JOURNAL are reviewed by the editorial correspondent of the New York *Times* in Boston, who asks whether they are the forerunner of a new railroad for Maine. As the writer in the *Times* sees it, the warrant for the project is the enormous area of untouched timber lands which thus might be brought into the market, said to be the largest such area east of the Rocky Mountains.

The vehicle to this end would be the Quebec Extension Railway, frequently called the Gould Railroad, for which Senator Arthur R. Gould some years ago obtained a charter to build across northern Maine from Washburn, a point common to the Bangor & Aroostook and the Aroostook Valley to the Canadian border, a distance of about 112 miles. Recently Senator Gould turned over all his rights in the Quebec Extension Railway including the charter, to R. H. Wheeler of Sanderson & Porter of New York City, and affirmed his faith in the construction in the near future, at a cost estimated at $4,000,000.

To eliminate the fire hazard in the timberlands the road would be operated by electricity. At one time the Bangor & Aroostook opposed the construction of the new line, but a decision by the Interstate Commerce Commission removed its main objections and thus far the way is clear. After hearings on the application of Senator Gould for the required certificate of "public convenience and necessity," the I.C.C. "allowed the road," with the condition that the Bangor & Aroostook must be given the same joint rates, as favorable freight divisions and car supply, and be treated in all other ways on a precise equality with the Quebec Central. The latter is a subsidiary of the Canadian Pacific and with it the projected Quebec Extension would connect at the Canadian border. For years there has been speculation in Maine as to whether this road will be built; today there is more talk about it than in a long time before.

Are the Insull interests, now strong in the water power development of Maine, about to acquire possession of the Maine Central Railroad? This also is a subject just now of extensive speculation in the Pine Tree State. One fact of general knowledge is that the Central Maine Power Company, which is an Insull corporation, endeavored to induce the railroad to electrify the whole or a part of its system, and that experts were employed to investigate and report on the proposal.

Ohio Village Favored in Improvement Dispute

That the village of Eaton, Ohio, had the right to prescribe the conditions under which certain improvements were made, and which concerned, among other things, the paving of part of the line of the Dayton & Western Traction Company, is held in a recent decision of the Court of Appeals. The railway was operating on a franchise allowed by the county, but when the village extended its lines, the trackage was included and affected by some paving improvements. Judge E. P. Middleton, hearing the issues at trial, decided in favor of the village, and the Court of Appeals, in rendering its decision, sustained him.

Tokens Replace Tickets in Binghamton

In place of the paper tickets metal tokens are in use since Sept. 2 on the lines of the Binghamton Railway, Binghamton, N. Y. They are sold at the same price, that is, four for 30 cents, or thirteen and a carrier for $1. The change in the method of collecting fare on the railway lines is not effective on the buses.

Recent Bus Developments

Rehearing on Pacific Electric Petition Refused

The California Railroad Commission has denied the petition for rehearing of the application of the Pacific Electric Railway for authority to discontinue railway service on its Upland-Ontario line in the city of Ontario, and to substitute motor coach service. This rehearing was sought by certain protestants against the commission's action. An extension of time until Oct. 6 has been granted to the company to make the substitution.

Another Bus Line in New Rochelle

The Westchester Electric Railroad on Aug. 30 applied to the Public Service Commission of New York for approval of the substitution of buses for trolley cars on its East Main Street line in New Rochelle under a consent of the city dated Aug. 15. The company says the change is for public benefit.

Change in Bus Service in Salt Lake City

Application to discontinue bus service to the Val Verda district, north of Salt Lake City, has been filed with the Public Utilities Commission of Utah by the Utah Light & Traction Company. The application states that this line is being operated at a considerable loss. Discontinuance would not affect service to Centerville and Bountiful.

Court Approves Grant for Seattle-Everett Highway

After a previous reversal for an error of facts by the Department of Public Works at Olympia, Wash., Judge John M. Wilson of the Thurston County Court recently affirmed an order of the department granting a certificate to B. Krakenberger for passenger and express service by bus over the new Seattle-Everett Pacific highway, and denying the application of the Northwest Traction Company. Judge Wilson flatly disagreed with the reasoning of the department, but declares it has wide discretion in such matters, and that there was not sufficient evidence that the department had acted arbitrarily or capriciously.

Hay Ride of Yesterday Becomes Bus Trip of Today in Buffalo

The International Bus Corporation, a subsidiary of the International Railway, Buffalo, N. Y., reports that increased use is being made of its rent-a-bus service for private parties. A pamphlet has been issued under the title, "Remember the Ol' Straw Ride," in which attention is called to this service for picnics, athletic contests, real estate trips, historical tours, school and church services, conventions, lodges and clubs, transporting workmen, parades, sales conferences, industrial tours and theater parties. For this service, the International Bus Corporation is using its city type gas-electric buses.

Contrasting this service with the old hay rack parties of twenty years ago, the company says in part:

We have learned that it is not necessary to put up with the hardships that prevailed before the turn of the century. With a full knowledge of the demands made by the public on modern travel, Mitten Management now operates a de luxe bus service which can be rented at a low rate and which answers the needs of all types of group movements.

St. Louis Company Offers to Supply Service

The St. Louis Public Service Company has applied to the Missouri Public Service Commission for a certificate of convenience and necessity for the operation of a bus line between Maplewood and Kirkwood in St. Louis County, Mo. A 30-minute schedule would be maintained on the proposed route.

The De Luxe Bus Company now operates buses between Maplewood and Kirkwood. In recent weeks complaints have been made that the service offered by this company was neither satisfactory nor dependable. Formal charges against it were filed recently with the commission.

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Financial and Corporate

$1,188,960 Net Income on Brooklyn City

Revenues from transportation on the Brooklyn City Railroad, Brooklyn, N. Y., were $11,428,812, a decrease of $31,772 compared with the year ended June 30, 1927. Other operating revenues decreased $7,496, the total operating revenues being $39,269 less than last year. These facts were disclosed in the annual report of the company for the year ended June 30, 1928. Operating expenses for the year decreased $4,630 despite the fact that the cost of operation of cars increased $109,677, this additional cost being almost entirely due to the 5 per cent wage increase effective April 15, 1927. A special provision of $45,500 from income credited to the reserve for legal expenses, caused the general and miscellaneous expenses to increase $43,852. During the previous year no provision for this purpose was made. Other items of operating expense decreased $158,160.

The accident prevention bonus plan put into effect in August, 1926, whereby motormen and conductors receive cash awards for the operation of their cars without accidents, has substantially reduced the number of accidents. The past year showed a decrease of $241,291 in the actual cost of accidents compared with the previous year and the actual expenses were $203,993 less than the amount set aside for this purpose and charged to operating expenses. As of July 1, 1927, the tax levied by the state of New York on the gross earnings of the company was reduced from 1 per cent to ½ of 1 per cent which accounts for the saving in taxes.

INCOME STATEMENT BROOKLYN CITY

	Fiscal Year Ending June 30, 1928	1927
Passenger revenue	$11,428,812	$11,460,569
Other car revenue	.....	15
Total transportation revenue	$11,428,812	$11,460,584
Advertising and other privileges	100,833	99,999
Rent of land and buildings	17,754	19,153
Rent of tracks and terminals	49,042	53,402
Sale of power	15,333	17,784
Miscellaneous revenue	714	834
Total operating revenue	$11,612,490	$11,651,759
Operating expenses		
Maintenance—		
Way and structures	$1,339,462	$1,361,543
Equipment	1,087,203	1,177,232
Power	1,111,077	1,119,829
Operation of cars	4,416,416	4,306,739
Injuries to persons and property	816,859	854,157
General and miscellaneous expenses	550,406	506,554
Total operating expenses	$9,321,426	$9,326,056
Total operating revenue	$2,291,064	$2,325,702
Taxes assignable to operations	661,376	714,541
Operating income	$1,629,687	$1,611,161
Non-operating income	73,643	72,493
Gross income	$1,703,330	$1,683,654
Income Deductions		
Interest	$467,453	$512,492
Rent of cars and tracks	24,433	25,044
Other deductions from income	22,483	25,529
	$514,370	$563,066
Net income	$1,188,960	$1,120,587

Increase in Brooklyn Net Income

For the two-month period ended Aug. 31, 1928, total operating revenues of the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., were $8,032,408 against $7,813,429 for a similar period ended Aug. 31, 1927. Total operating expenses increased from $5,325,525 to $5,414,027 in 1928. After the consideration of income deductions the net income for the 1928 period was $869,496 against $775,929 for the two months ended Aug. 31, 1927.

Stone Mountain Line Discontinued

Following an order from the Georgia Public Service Commission service on the Stone Mountain interurban line between Atlanta and Decatur, Ga., has been discontinued and Decatur has been made the terminus of the line. Under the new schedule, cars leave at 5:27 in the morning from Decatur and run at hourly intervals to Stone Mountain until 11:27 in the evening, when the last car leaves. Passengers on inbound cars are given transfers over the two Decatur lines to Atlanta.

Canadian Control for British Columbia Company

Net profits of the British Columbia Electric Railway, Vancouver, B. C., for the fiscal year ended June 30 last after the payment of all charges, including bond interest, British income tax, etc., are understood to have been sufficient to pay a dividend of $2 a share on the 1,000,000 shares of Class A stock of the British Columbia Power Corporation, the newly formed Canadian company which secured control last spring.

The annual meeting of the company takes place in London during the second or third week of December. It is possible that at the meeting proposals will be brought forward to dissolve the British company. This will eliminate the heavy income tax payments of the British Columbia Electric to the British Government, thus enabling the company to make a larger return to British Columbia Power. It is not known what method will be adopted to dissolve the British Columbia Electric Railway, but the simplest would be the transfer of all assets and undertakings of the company to the British Columbia Power Corporation. This being done, the charter of the old company could be surrendered and the whole enterprise become Canadian.

Another Owner of St. Paul Southern

The much sold St. Paul Southern Electric Railway, Minneapolis, Minn., has changed hands again. Its latest buyer is B. W. & Leo Harris Company, a firm of that city which deals in construction machinery. The purchase was made from Paper, Calmenson & Company, St. Paul, who bought the road in August at receiver's sale in Hastings, Minn., southern terminus of the line. By order of the court the line is out of commission but its final disposition has not been announced.

Toronto System Does Well

Municipal system serving metropolitan district of Canadian city makes good showing. Modern methods contribute

RESULTS of operation by the Toronto Transportation Commission, Toronto, Ont., Canada, for the year ended Dec. 31, 1927, were satisfactory, according to D. W. Harvey, general manager of the commission. Revenue increased and operating expenses were still further decreased. In the sixth annual statement of the commission Mr. Harvey stated that in accomplishing the reduction in operating expense, an important factor was the extended use of one-man cars, which resulted not only in operating economies but in improved service. The class of transportation chiefly responsible for the increase in gross revenue was emphasized. General Manager Harvey explained that year by year it is becoming increasingly obvious that city transportation services

COMPARATIVE STATEMENT OF REVENUE ACCOUNT OF TORONTO TRANSPORTATION COMMISSION

Income:	1927	1926
Passenger earnings:		
Railway and bus transportation	$11,640,481	$11,362,690
Motor coach transportation	568,275	300,811
Income from sundry other sources	426,562	386,802
Gross income	$12,635,320	$12,050,304
Expenditure:		
Cost of electric current, including operation and maintenance of substation	$1,181,634s	$1,173,581
Expenses of operation, maintenance, repairs, administration and taxes, including accrued charges and operation of motor coaches	6,424,446	6,335,334
Total expenditure	$7,606,080	$7,508,915
Net income available for fixed charges	$5,029,239	$4,541,388
Fixed charges:		
Interest, less interest on idle funds	$2,180,458	$2,233,494
Reserves on capital account:		
Redemption of debenture debt	1,086,717	1,039,550
Reserve for replacements	1,323,708	998,911
Reserves on operating account:		
Reserve for unredeemed tickets	50,000	.....
Reserve for workmen's compensation and public liability	125,000	132,480
Reserve for contingencies	138,000	60,000
Reserve for doubtful debts	8,700	.....
Organization expenses	.....	.....
Total fixed charges and reserves	$4,912,583	$4,464,437
Net income carried to surplu	$116,655	$76,951

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REVENUE PASSENGERS OF TORONTO TRANSPORTATION COMMISSION
(City Fare System)

Year	
1921 (four months)	61,870,213
1922	187,145,261
1923	189,143,145
1924	185,203,698
1925	180,779,925
1926	183,494,076
1927	187,757,023

Month	1927	1926
January	15,941,098	15,687,830
February	15,207,363	15,067,733
March	16,556,470	16,487,826
April	15,182,565	15,177,829
May	15,401,978	15,224,681
June	15,026,336	14,588,118
July	14,188,658	13,930,141
August	15,042,437	13,976,569
September	16,111,085	15,616,925
October	15,884,572	15,423,929
November	16,074,967	15,504,898
December	17,139,494	16,807,597

are no longer a local problem only; that if the commission had adopted the policy of providing transportation only for those citizens of Toronto who desire to be carried from one part of the city to another, the gross passenger revenue in 1927 would have been less than it was in the year 1923 instead of (as a matter of fact) exceeding the revenue of 1923 by approximately $565,000.

Motor Coach Development Exceeds Expectations

The development of motor coach transportation exceeded all expectations. In 1925 a revenue of $132,080 was obtained and in 1927 the gross revenue had increased to $568,275. All of this revenue is additional to the normal street railway revenue. The commission adopted the method followed by many of the larger railways operating buses and coaches and in June, 1927, created a company known as Gray Coach Lines, Ltd., with an authorized capital of $1,000,000. The commission then transferred to this company the existing investment in motor coaches. Use of the name "Gray Coach Lines," it is believed, has a distinct commercial value in advertising and publicity for this branch of transportation.

After providing for all operating expenses and depreciation on the coaches and other reserves the Gray Coach Lines returned 5 per cent interest on the investment as shown in the revenue account for 1927. The great expansion in motor coach transportation is seen in the commission's statement. Total operating expenses for 1927 were $7,606,080, an increase of $97,164 compared with the expenditures in 1926. An analysis of these figures shows, however, that this increase in operating expenses is due to the great expansion of motor coach transportation and that the expenditures for operating the street railway and buses of the commission were actually less than in 1926 by approximately $100,000.

Record of Revenue Passengers Satisfactory

The mileage operated by street cars and buses, but not including motor coaches aggregated 25,970,091 miles in 1927, an increase over the mileage in 1926 of 436,198. Extensions of track built in 1927 totalled 3.105 miles and the net addition to trackage was 0.799 miles.

The accompanying table sets forth the number of revenue passengers carried on the street railway and buses of the commission for each year since 1921, exclusive of the passengers carried in motor coaches. The number carried in 1927 was 187,757,023, a gain of 4,262,947 passengers compared with the previous year. The record of 189,143,145 revenue passengers established in the year 1923 still stands as the highest for the commission.

Suggest Names of Interborough Directors

At a meeting of voting trust certificate holders of the Interborough Rapid Transit Company, New York, for the purpose of nominating directors, nominations did not take place because of the lack of a quorum. It was recommended, however, that Frank Hedley, president and general manager, and H. M. Fisher, secretary and treasurer, whose terms expire this year, be re-elected.

A second meeting of the Interborough took place, at which bondholders were to nominate a director. This meeting also lacked a quorum. Bondholders present, however, suggested re-election of Frederick H. Ecker. Other directors whose terms expire this year are Abel E. Blackmar, one of the public directors, and Bertram Cutler, representing the Manhattan Railway.

Traffic Increase in Edinburgh

The total revenue for the year ended May 15, 1928, on the combined electric and bus systems of the city of Edinburgh, Scotland, Transport Department, was £880,788, compared with £874,055 for the year previous. Passengers carried numbered 152,077,901 compared with 143,836,772 for the year ended May 15, 1927. The number of railway passengers carried for the year increased 4,380,002. These facts were disclosed in the report and analysis of income and expenditure for the year.

R. Stuart Pilcher, Transport Manager, states that the success of the transport industry should not be judged by the amount of available balance or the total receipts earned, but rather by the number of passengers carried and the charges made for travel. Despite the fact that during the past year the department carried more than 8,000,000 additional passengers, the operating costs per car mile was reduced over the similar cost that was recorded for the previous year.

The net surplus on the year's working was £4,027. This being a disposable balance the committee resolved that this be appropriated as a special contribution toward the liquidation of debt. The surplus on the bus operation was £4,576.

Improvements during the year included an order placed Oct. 27 for 23 buses, the change in a number of cars to upholstered seats on the upper deck and the treatment of 2¾ miles of track with the "in situ" process.

Hearing Closed on Plan to Take Philadelphia Underliers

The underlying companies of the Philadelphia Rapid Transit Company fixed the value of their holdings at $151,000,000 at a hearing before the Public Service Commission on Sept. 5, and the city's petition for appraisal was taken under advisement.

The Mackey Administration has accepted the $136,000,000 valuation of the underliers fixed by Charles C. McChord, utilities expert, as a basis for its program of acquisition, and doubt was expressed that the city would proceed to condemn if the commission in its appraisal upholds the increase of $15,000,000 in the contemplated purchase price.

The city plans to take over the underliers' holdings and substitute itself as franchise lessor to the P. R. T., which pays those companies more than $8,000,000 annually in rentals. Under the McChord plan, it was estimated that the city, by elimination of tax payments and other charges, could save $4,500,000 a year by such an arrangement.

Counsel for the underliers argued that the theory that the underliers had no tangible property and only franchise rights was illusory. It was pointed out that the Philadelphia and the Union Traction Companies have provisions in their leases to the P. R. T. whereby, in the event of default of rentals, the underliers can take possession of the lines leased to the P. R. T.

Mayor Mackey said after the hearing that the appraisal decision and the agreement between city and company on that figure, or a compromise amount, would have to be concluded in time to have the proposal placed before the voters at referendum in November. He is quoted as follows:

> Otherwise the administration will abandon the entire project. There will be no appeal from the commission's valuation on the part of the city. If the figure is feasible, economical and acceptable to both parties we shall proceed. If the underliers balk at the appraisal rendered and take an appeal from the commission's decision to a higher tribunal, then we shall withdraw.

As a first move on the part of the leased lines to block condemning and purchasing the underliers of Philadelphia Rapid Transit Company suit was filed on Sept. 10 by the Thirteenth and Fifteenth Streets Passenger Railway, which alleges the city is without legal power to condemn the underliers. It is the first action of the kind. A permanent injunction to restrain the city from condemning and purchasing the company's property is sought in the suit filed in Court of Common Pleas No. 4.

Revenue Passengers on Decline in St. Louis

The St. Louis Public Service Company, St. Louis, Mo., carried 1,147,923 fewer revenue passengers in July than during the similar month in 1927, but gained $10,896 in revenue, due to the increase in fare from two tokens for 15 cents to 8 cents straight for adults. In

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July the railway system transported 19,362,810 revenue passengers, compared with 20,499,824 in July, 1927. Revenues for July were $1,507,364 compared with $1,496,467 in July last year. During the month the number of car-miles was reduced 75,483, the system operating 3,451,361 car-miles against 3,526,844 miles in July, 1927.

Railway Net Earnings Consistent in Salt Lake City

The electric power, light and gas properties of the Utah Light & Traction Company are leased to the Utah Power & Light Company for 99 years from Jan. 1, 1915. The Utah Light & Traction Company operates its street railway property. The company's service thoroughly covers Salt Lake City and extends into all the important suburbs and suburban towns. The statement of earnings of the company contained in the annual report of the Electric Power & Light Corporation is given in the table above.

The estimated population served by the Utah Light & Traction Company at Dec. 31, 1927, and certain traffic data for the twelve months ended on that date, compared with the two previous years, follow:

COMPARATIVE STATEMENT OF EARNINGS OF UTAH LIGHT & TRACTION COMPANY FOR YEARS ENDED DEC. 31

	1927	1926	1925	1924
Gross earnings from operation of railway department	$1,865,661	$1,871,689	$1,841,060	$1,852,762
Operating expenses, including taxes, of railway department	1,459,356	1,483,450	1,447,310	1,479,155
Net earnings from operation of railway department	$406,305	$388,239	$393,750	$373,607
Other income (including rentals from lease of electric and gas properties)	595,782	585,191	560,080	536,755
Total income	$1,002,087	$973,430	$953,830	$910,362
Interest on bonds	841,765	841,765	841,765	841,765
Other interest and deductions	175,838	147,170	123,261	82,757
Balance	*$15,516	*$15,505	*$11,196	*$14,160

*Deficit

	1927	1926	1925
Population served	156,000	155,000	153,000
Passengers carried during twelve months	30,613,897	32,191,522	34,750,262
Car-miles	6,016,105	5,959,358	5,887,653
Car-hours	586,915	590,491	605,562
Average number of cars operated	81	81	83
Miles of street railway (single track equivalent)	*121	*135	146

*Decrease due to abandonment of certain track in suburban districts in Davis County and Salt Lake County.

Traffic Increase in Brazil

The tramway department of the Brazilian Traction, Light & Power Company carried 584,055,133 passengers in 1927, compared with 552,078,727 in 1926, and 526,240,551 in 1925. The car-miles (tramways) run totaled 51,249,269 in 1927, compared to 48,968,857 in 1926. In spite of a continuance of depressed industrial conditions, throughout the greater part of the year there were substantial increases in all departments of the business, with consequent increased receipts in Brazilian currency. These facts were brought out in the annual report of the board of directors for the year ended Dec. 31, 1927.

During the year, 1927, the sum of $11,955,309 was expended by the company in meeting the current capital requirements of its subsidiary companies. Of this amount, $2,975,046 was used for transportation purposes. In both São Paulo and Rio de Janeiro, proposals include the construction of rapid transit lines partly underground and partly on private right-of-way, the extension of the service to new districts, double-tracking of single-track lines, additions to rolling stock, substitution of closed for the present open type of passenger cars, and other improvements on the tramway and bus systems. All these are dependent upon receiving substantial increases in fares and various modifications in the concessions.

During the year, 16.37 miles of track were constructed and approximately 44 miles of track were reconstructed. Additions to the rolling stock comprised 43 cars of the closed type.

The number of competing buses increased during the year, but many of these have since been withdrawn from traffic, the number now in operation being approximately 130. In São Paulo the company acquired ten buses from the competing concern, but otherwise no additions have been made to its fleet. The future of this service is mainly dependent upon the decision to be taken by the Municipal authorities on the company's proposals dealing with the traffic problems.

Merger of Ohio Companies Planned Under Allied Power

Announcement was made on Sept. 17 of a plan to merge the Penn-Ohio Securities Corporation and the Northern Ohio Power Company with the Penn-Ohio Edison Company, controlled by the Allied Power & Light Corporation, as a measure to simplify the corporate structure of this public utility group. An offering of rights to stockholders of Penn-Ohio Edison to purchase new stock to the extent of 10 per cent of their holdings is an important part of this proposal.

At the present time Penn-Ohio Edison is controlled by Penn-Ohio Securities, and in turn the Edison company controls the Northern Ohio Power Company. By completely merging the three properties the capital structure of the system will be greatly simplified and the management co-ordinated.

The news of the merger is contained in a joint letter to stockholders of all three companies, signed by R. P. Stevens, as president of Penn-Ohio Edison and Penn-Ohio Securities, and by B. C. Cobb, as president of the Northern Ohio Power Company.

The outstanding 7 per cent bonds of the latter company in the amount of $3,283,100 will be retired, removing all funded debt except that pertaining directly to the Penn-Ohio Edison Company.

Personal Items

L. Wainman in Porto Rico

Lon Wainman has been promoted to the position of superintendent of distribution of the Ponce Electric Company, Ponce, Porto Rico, from that of assistant superintendent of distribution of the El Paso Electric Company, El Paso, Texas. He had advanced through various positions with the latter concern from Aug. 11, 1921, when he was first employed in the distribution department. At one time he was connected with the Texas Power & Light Company, the San Joaquin Light & Power Company and the Department of Public Service, Los Angeles, being connected with the bureau of power and light on substation work.

Named on New Jersey Commission

Governor Moore has named William F. Hoffman, of East Orange, and John Mantell, of Jersey City, to the North Jersey Transit Commission. They succeed James O. Bettelle, of Newark, and Daniel A. Garber, of Ridgewood, resigned. The term of office is for three years.

Sixty Years With Louisville Railway

Col. Jacob Fishback, one of the pioneers in the Louisville Railway organization was sketched recently in one of a series of interesting interviews with prominent men, as run in the Louisville *Times*. Colonel Fishback, in this interview, tells of the early days when there were three railways in Louisville, and a fight for supremacy in which many miles of duplicate track was laid, a condition from which the present company is suffering. The management has discontinued some of the parallel lines the past few years in trying to reduce operating expenses. Among other things the *Times* said:

Colonel Fishback has worked for the Louisville Railway nearly 60 years. In

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point of service he is its oldest employee. He takes a month's vacation every year and travels as far as possible. He has covered the United States from Boston to San Francisco, the Canadian line to New Orleans, and his observations have led him to the conclusion that the entire country progresses in pretty much the same way. He has seen businesses which commenced modestly in one-room establishments grow to successful and tremendous landmarks and says the same thing is true of the railway.

Through many years of effort from motorman, assistant night foreman at one of the carhouses to foreman, and finally to assistant superintendent of the entire Louisville Railway, Colonel Fishback's record shows diligence and effort.

N. W. Bolen Will Wear Gold Service Button

Newton W. Bolen, executive assistant, Public Service Corporation of New Jersey, has completed 25 years of service with that organization. He started on railway work in 1883 with the Brooklyn City Railway as a hillboy at the Broadway Ferry, towing cars up the hill with horses. Mr. Bolen became inspector foreman of carhouses and later western division superintendent for that company. On Aug. 1, 1903, he went to New Jersey and was appointed superintendent of Hudson and Passaic divisions for Public Service. About three years after that he was made superintendent of transportation and in 1911 general superintendent of transportation. On Nov. 1, 1923, he became executive assistant in Hudson and later of the Bergen divisions.

W. S. Penfield has been appointed superintendent of the motor bus division of the Key System Transit Company, Oakland, Cal. This new post was made necessary by the recent organization of a separate bus department to handle the increase in that branch of the company's service.

C. N. Posegate, former railroad engineer of the Illinois Commerce Commission, has been appointed chief engineer. He succeeds C. G. Bennett, resigned.

Henry Cordell, master mechanic of the Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., has been elected chairman of the Transportation Section of the Wisconsin Utilities Association.

Obituary

Hartford T. Brobeck, superintendent of the transbay division of the Key System Transit Company, Oakland, Cal., died recently. He entered the employ of the company as a motorman in 1902 and advanced through various positions being appointed superintendent of the transbay division in 1924. Mr. Brobeck was born in Rochester, Pa., 54 years ago. He was a brother of the late W. I. Brobeck, San Francisco attorney and formerly chief-counselor for the railway.

Manufactures and the Markets

Timken Steel & Tube Company Formed

Announcement has just been made by the Timken Roller Bearing Company, Canton, Ohio, of the incorporation of a new company, known as the Timken Steel & Tube Company, which will take over the manufacture and selling of Timken steel and tubing. The headquarters and mills are in Canton, Ohio, with sales offices in Chicago, Los Angeles, Detroit and New York. The officers are: H. H. Timken, chairman; M. T. Lothrop, president; J. W. Spray, vice-president; A. J. Sanford, vice-president in charge of sales; J. E. Daily, vice-president in charge of operations, and J. F. Strough, secretary and treasurer.

Ellcon Company to Handle Peacock Brakes

Under an arrangement which becomes effective immediately the Ellcon Company of New York City will be general sales representative for Peacock Staffless Brakes in the United States, Canada and foreign countries. Announcement to this effect has been made by Frank D. Miller, president of the National Brake Company of Buffalo, N. Y., manufacturer of the Peacock brakes. The addition of this device extends the field of activity of the Ellcon Company which since its organization in 1910 has specialized in passenger car equipment devices. The Peacock brake, although widely used on passenger cars, is used also on freight equipment. William Wampler, president of the Ellcon Company will devote particular attention to this phase of the company's activity.

Coated Abrasive Products Simplification in Effect

Following the approval of a tentative simplified practice recommendation for coated abrasive products, by a general conference of all interested elements of the industry, the Division of Simplified Practice of the Bureau of Standards, U. S. Department of Commerce, circularized the producers, distributors and users of the commodity for signed acceptances to the recommendation.

The Division of Simplified Practice has just announced that this project is now in effect, as of Sept. 1, 1928, since a sufficient number of signed acceptances, representing at least 80 per cent by annual production, have been received from the industry. At the time the project was considered by the general conference, it was stipulated that industry would have until Jan. 1, 1929, to get rid of stock manufactured previous to the promulgation of the simplification, which is known as simplified practice recommendation No. 89, coated abrasive products.

Manufacturing Production Higher

Manufacturing production in July, after allowances for the usual seasonal variations, was greater than in either the preceding month or July, 1927. The output of minerals likewise recorded advances over both comparative periods. Pig-iron production, though showing a decline from June, making no allowance for differences in working time or seasonal conditions, was greater than a year ago. The output of steel ingots was also lower than in June but larger than in July of last year. Automobile production showed a slight decline from the preceding month but was considerably larger than in July a year ago.

The output of crude petroleum showed a decline from last year. Bituminous-coal production was larger than in either the previous month or July a year ago. Copper production showed gains over both periods. The production of cement showed practically no change from either the preceding month or the corresponding month of 1927.

Sixteen Buses for Louisville

Kentucky Carriers, Inc., a subsidiary of the Louisville Railway Company, Louisville, Ky., has just purchased sixteen new 21-passenger buses, fourteen of which are Studebakers, the other two being Macks. These buses have been purchased in connection with the plan under which buses will be used for local stops on Broadway, the electric cars operating under an express service, and only making stops at the crosstown intersecting lines, other than in the congested downtown district. This service is to be started on Sunday, Sept. 23.

Westinghouse Sales Up

Sales of Westinghouse Electric Manufacturing Company, Pittsburgh, Pa., are greater than a year ago and reports from all branches indicate continued improvement in volume during the remainder of the year. The company has spent $40,000,000 on plant improvement in past six years. This expansion will make it unnecessary to make additional plant investments for some time. Greater efficiency is making it possible to secure a larger output from production units.

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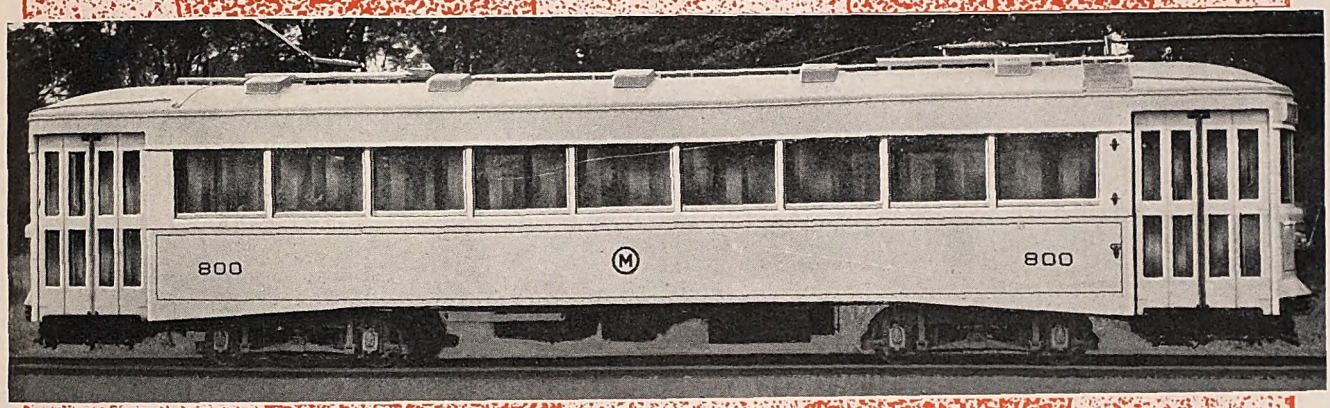


Brill Convention Cars Bear the Mark of Progress

The Brill Cars which are being exhibited at the Convention bear the mark of progress and represent the accumulated skill and experience of many years' activity in the car building industry.

You will discover numerous improvements which have been developed to meet the new-day demand for pleasing appearance, added comfort and safety. Features which contribute to economical operation have also been given careful consideration.

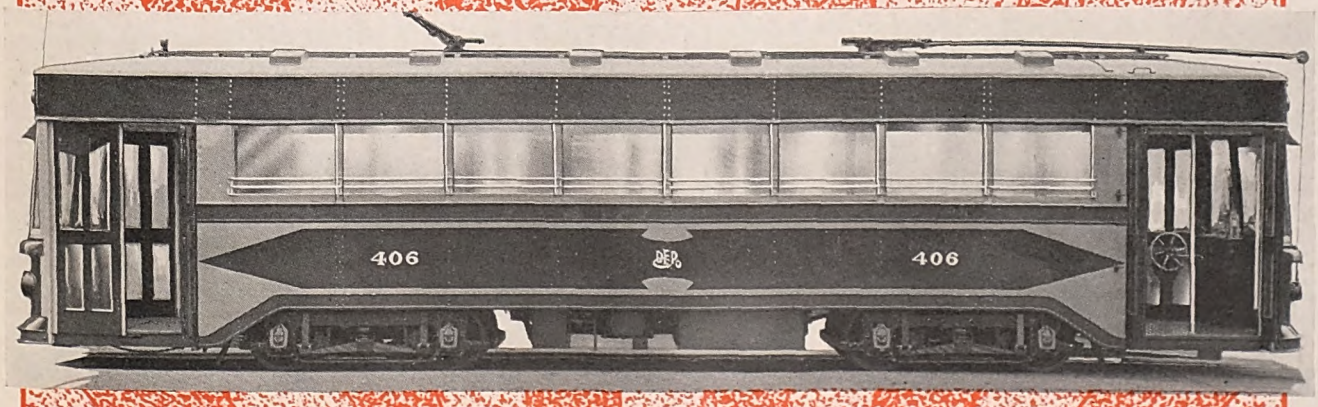
Seemingly, these new cars for Wilmington, Delaware and Fairmont, West Virginia, were purchased because the operating companies could not afford or did not choose to experiment with untried construction principles yet they were in accord with the modernization program which was planned with the aid of Brill engineers.

Inspect this new equipment on Track "D."

Indoor exhibit—space 120

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.



BRILL MODERN CARS

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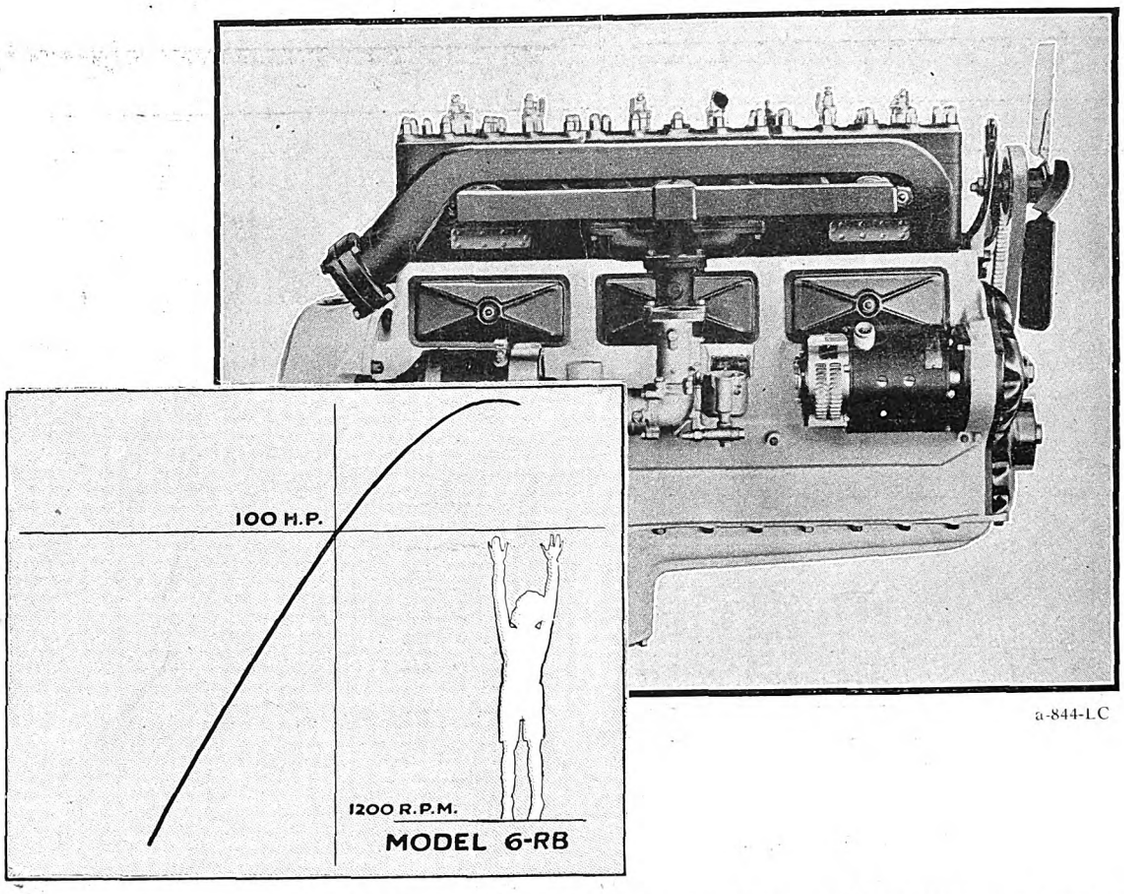

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100 H. P. Easy

Engines that must always stretch to reach the normal power demand are like men constantly on tip toe--they soon get flat feet. Motor coaches equipped with engines that don't need to stretch can cover more miles on faster schedule, and haul more passengers in vibrationless comfort, with less lost time and at lower operating cost, than the over stressed variety. And that's that!

These big, low-speed Waukesha Six-Cylinder Motor Coach engines have been proved by months of continuous night and day testing at way over 100 H. P. These tests demonstrate conclusively the merits of the genuine "Ricardo" cylinder heads, dual-cast, "truncated," non-rocking cylinder blocks, filtered oil lubrication, 3½" chrome nickel crankshafts, and super-rigid "girder" type crankcase. If your engines have flat feet you should write for new special bulletin No. 681.

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AUTOMOTIVE EQUIPMENT DIVISION

WAUKESHA MOTOR COMPANY

Waukesha *Eastern Sales Offices* — *Eight W. 40th Street* — *New York City* **Wisconsin**

Exclusive Builders of Heavy Duty Automotive Type Engines for Over Twenty Years

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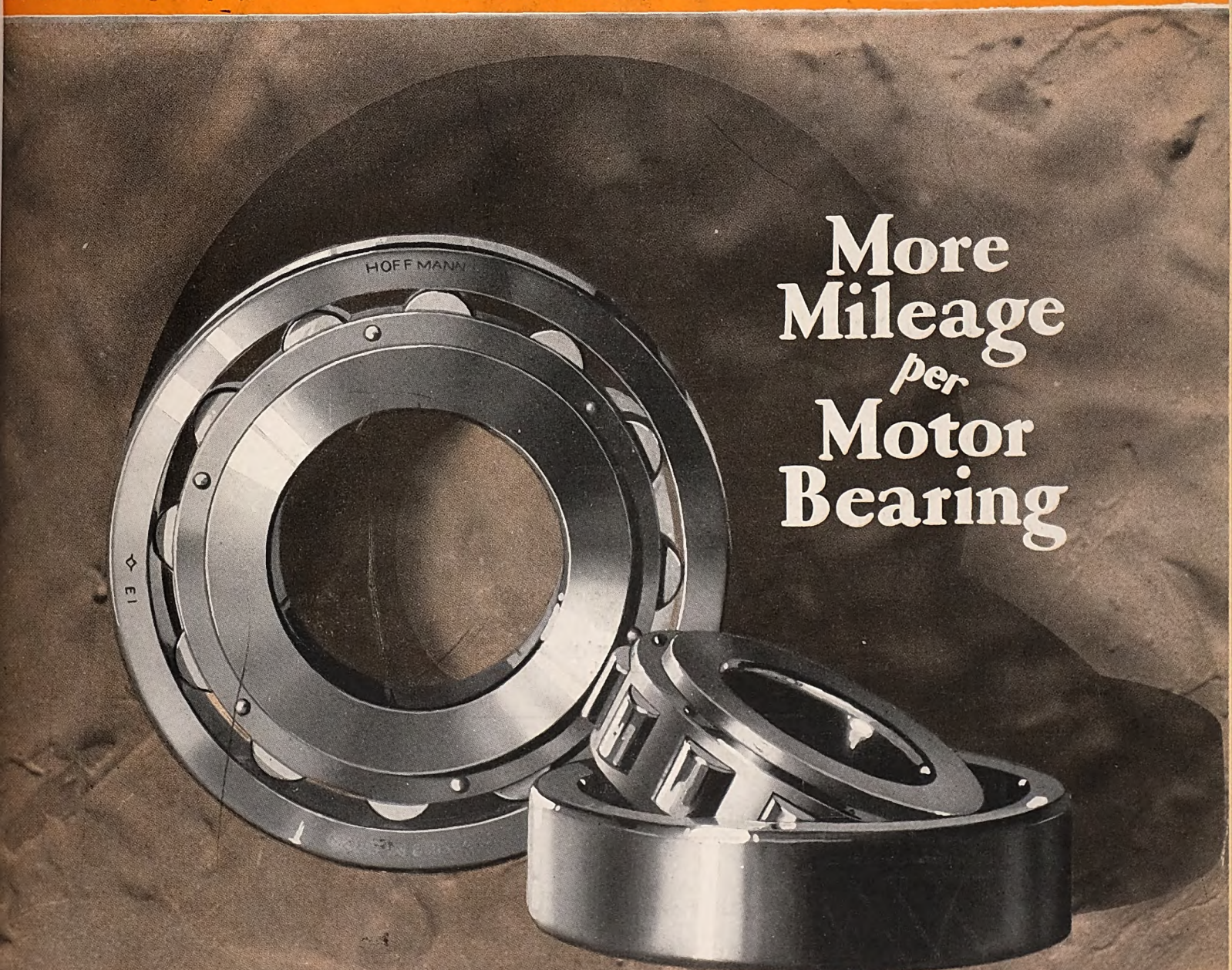
CONVENTION REPORT NUMBER

ELECTRIC RAILWAY JOURNAL

Graw-Hill Publishing Company, Inc. SEPTEMBER 29, 1928 Twenty Cents Per Copy



More Mileage per Motor Bearing

HOFFMANN

PRECISION ROLLER BEARINGS

NORMA-HOFFMANN BEARINGS CORP'N, STAMFORD, CONN., U. S. A.

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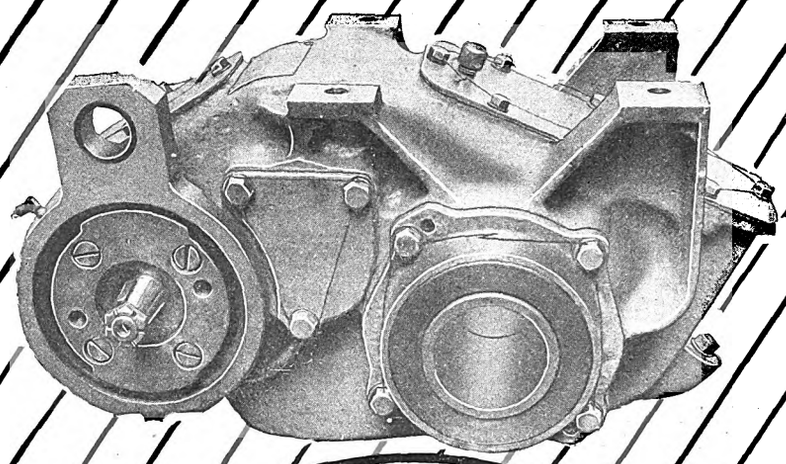

Today's equipment to meet tomorrow's competition

Modern cars today are successfully meeting competition of other forms of transportation. But how about tomorrow? Will electric cars continue to win out against automobiles which have still to offer models yet unborn?

This means that railway companies must look far into the future and adopt advanced types of equipment, if they would reap the benefits of the investments that they make today.

For transmitting power from the motor to the wheels, the new W-N Drive represents the latest development offered to the field to meet tomorrow's competition.

A compact steel encased unit of heat-treated hardened helical gears with Timken Roller Bearings, revolving in a continuous bath of oil, it gives a high ratio of speed reduction, permitting the use of light-weight, high-speed motors, with their higher efficiency, high acceleration, smooth starting and quiet operation.

Because of the construction and the materials used, this unit will be giving the same efficient service ten years from now as it does when first installed.

All Westinghouse-Nuttall Products are sold through the Westinghouse Electric & Mfg. Co. district offices. Refer your inquiries to the nearest Westinghouse Office.

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of Street Railway Journal and Electric Railway Review
CHARLES GORDON, *Editor*

LOUIS F. STOLL, *General Manager*

Volume 72 New York, Saturday, September 29, 1928 *Number 13*

Action!

YESTERDAY the 47th convention of the American Electric Railway Association came to a close. Today it has become history. We can therefore for the first time look back upon this memorable week in Cleveland and see in bold relief some of the high spots that stand out from a busy routine of meetings, conferences, discussions and inspections of new ideas in equipment.

The general program was built around three central topics, and a day was devoted to each. First was the subject of economics. Then came modernization, and finally a serious attempt to get an outside viewpoint of the industry. This covers a wide range of thought. When to the American Association program are added those of the four affiliated associations, the many topics at the luncheon conferences and the varied ideas suggested by inspection and discussion of equipment developments, one gets some conception of the varied angles from which the industry's problems were approached.

Regardless of the starting point, however, all currents of thought seemed to lead to one central idea. As the sessions progressed on the first day it seemed a strange coincidence that there should be this general agreement of thought. On the second day the apparently inevitable trend toward a common conclusion became more striking. This continued and persisted as speaker after speaker expressed his views until at the final fall of the gavel there no longer could be the slightest doubt but that the road to the solution of the present local transportation situation had been exhaustively surveyed and definitely charted.

There was almost universal agreement that the road to recovery and increased usefulness for the local transportation industry is that of service improvement. The slack in public transportation development resulting from the strangling effects of restrictive public control in the face of greatly increased costs must be taken up to avoid collapse of this essential community service under the pressure of increasing competition from the private vehicle. Definite evidence of the possibilities for making common carrier transportation attractive to the public must be provided before a full measure of public co-operation and patronage can be expected.

Testimony was given by those who have tried them of the operating economies, increased revenue, improved public attitude and strengthened employee morale to be obtained through the replacement of obsolete cars with modern equipment of types now available. There seemed to be general agreement that it is a hopeless struggle to continue fighting 1928 automobile competition with cars that have become antiquated through several decades of hard service. There was indorsement likewise of the advisability of utilizing equipment of types now available instead of holding up improvement programs to await the outcome of the several promising design experiments now under way.

All of this interest in cars did not detract from the realization of the importance of the many other factors that enter into improved service: smooth track, reliable power, loyal and well-drilled employees. There was no diversion of attention from the improvements being made in buses, or of interest in the progress being made in finding their proper place in the general scheme of transportation. If anything, interest in these many other phases of service improvement was augmented rather than decreased by the quickening of the pulse of transportation men who finally begin to see light ahead for their properties.

But there was something more in this convention. There was agreement beyond passive indorsement of the route to be followed toward recovery for the industry. There was general insistance on the need for immediate movement. There was a common warning of the dangers of delay. There was a call to action. This was repeated again and again by speaker after speaker, until it echoed and re-echoed through the ranks of delegates with an effect not unlike the bugle's strident notes piercing the quiet of morning's early hours to arouse an army ready for a general advance.

Action! Enough of waiting; let's go! Enough of discussion! Enough of debating the future! Success lies ahead if we will but follow the route established by those pioneers who have shown the way. There was no mistaking this call to the local transportation industry that comes from the 47th convention. There was no mistaking, likewise, the warning that unless the past five years of thought and study are now translated quickly into definite progress there is danger that there will be little left to save.

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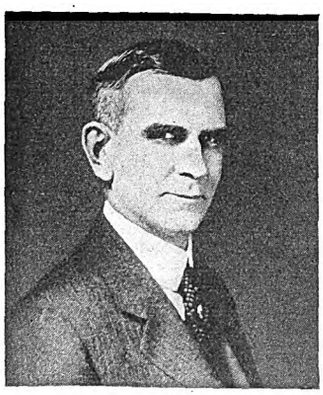
Newly Installed Officers of the

American Electric Railway Association

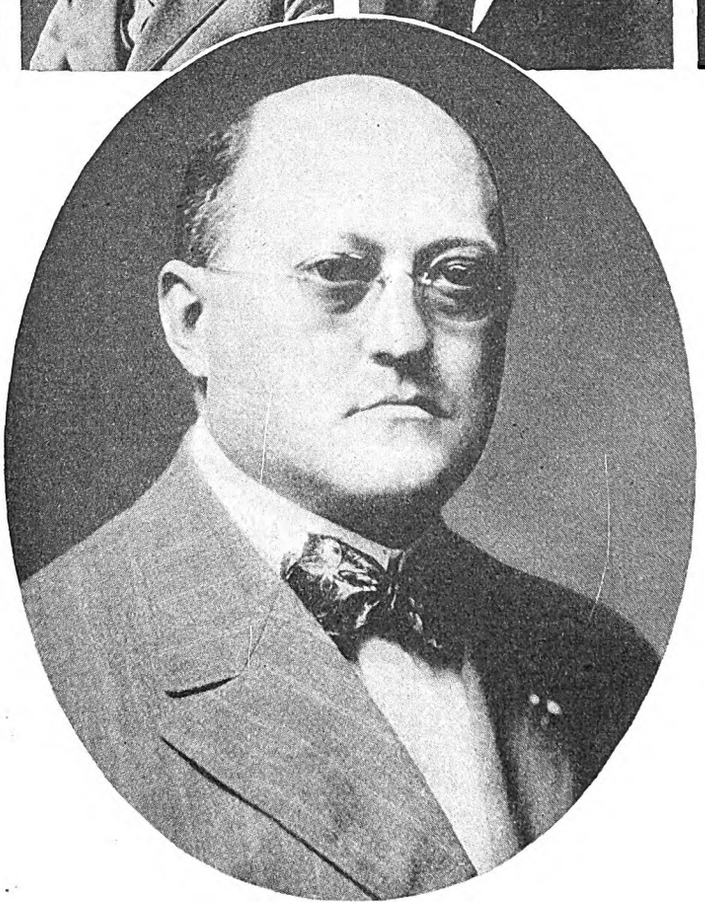
Paul Shoup,
First Vice-President



J. H. Hanna,
Second Vice-President

C. E. Morgan,
Third Vice-President

G. A. Richardson,
Fourth Vice-President



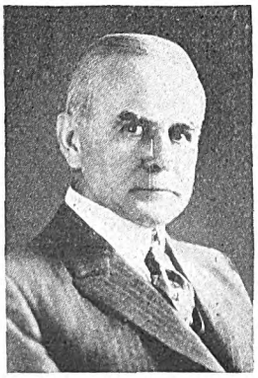
Barron Collier,
Treasurer

J. P. Barnes,
President

J. W. Welsh,
General Secretary

New Members of the Executive Committee

W. A. Draper



W. M. Wampler

Carroll Burton

E. D. Kilburn

H. B. Potter

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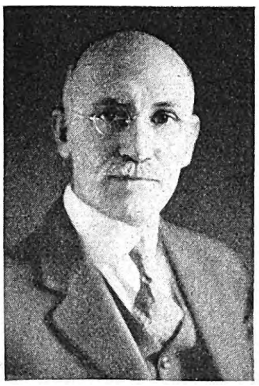
Luke C. Bradley



A. S. Grenier

E. F. Wickwire

Edwin B. Meissner

T. W. Casey

CONTINUING MEMBERS OF THE A.E.R.A. EXECUTIVE COMMITTEE

47th Convention Most Successful

Addresses, discussions and work of committees show change of thought from wishing to doing. American sessions replete with excellent addresses

ONCE more the American Electric Railway Association has held a notable convention at Cleveland —the third in succession—and has shown the material progress as well as the growth of faith and confidence in the ability to perform. Last year the plan of eliminating the committee reports from the American Association program was carried out successfully. This year the same plan was adopted, but in addition the session of the executive committee held last Saturday, at which these reports were presented, was made open to the delegates, so that they were able to review the work of the committees if they so desired.

The plan of opening the exhibits Saturday was continued, but they were all in place and the doors were thrown open at 9 a.m. instead of at noon. This materially increased the opportunity for inspection by those particularly interested in the developments of the year.

The formal opening of the convention took place Monday morning. Since the north wing of the Auditorium has been completed, it was possible to hold the meetings in a new ballroom on the third floor, doing away with the confusion and delay of past years, when opening exercises were held previous to the Monday morning session.

President R. P. Stevens, in opening the convention, called on City Manager W. R. Hopkins, who for the third time welcomed the delegates to Cleveland. Mr. Hopkins brought out that we are now living in the age of research, and up to the present time we have only touched the possibilities. This convention was particularly welcome, he said, not only because it represented an industry that gives great service to the public, but it was one that gives great promise of advancement. He expressed a hope that the convention would do much to strengthen the confidence of the public in transportation.

Mr. Stevens, in his presidential address, brought out the point that under the banner of public service we have carried on for many years, even though the industry has had to change greatly the conception of the nature of its business.

During the morning session the delegates listened to three other significant addresses. Henry I. Harriman, chairman of the Metropolitan Planning Board of Boston, spoke on the economics of and the need for public participation in city transportation.

Lewis E. Gettle, chairman of the Railroad Commission of Wisconsin, spoke on the regulation of transportation and its aims and trend. He went into great detail in

Joseph H. Alexander

D. W. Snyder, Jr.

J. G. Barry

Wm. F. Cutler

James R. Fitzpatrick

CONTINUING MEMBERS OF THE A.E.R.A. EXECUTIVE COMMITTEE

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expounding the principles of regulation which apply to public transportation companies.

The final address of the morning was on the problems of urban transportation rates, by Judge William M. Wherry, Jr., of Wherry & Wight, New York City. Mr. Wherry pointed out that for some time the public transportation industry has been in something like the position of one of the famous characters in "Alice in Wonderland." It has had to run hard to stay where it is. There is no agreement, no contract, he believes, that is fixed for all time. With the great changes in conditions and in money value it is necessary to make adjustments.

Modernization the Theme

Wednesday morning the American Association listened to a group of exceedingly significant papers. The general trend, modernization, was carried through the addresses of all the speakers.

Managing Director Lucius S. Storrs reviewed in his annual report the progress that has been made in the past five years and the change in sentiment the industry has undergone in that time. The briefs submitted in the Coffin Award competition, he said, give concrete evidence that the neutral attitude of electric railway executives which was evident at that time has completely changed. From a digest of the presentations it is apparent that the excellent results are obtained from a careful study of all elements of the problem. No one panacea stands out pre-eminently. Without exception the companies have carried to a conclusion merely those things that all have emphasized.

As a result, continued Mr. Storrs, these efforts have included the entire range of the activities of the industry. First, favorable public opinion has been obtained; second, cordial relations exist between employees and the corporation; third, constantly improving income statements are resulting. Fundamental customs and methods have been completely revolutionized. Track conditions have been improved and considerable mileage of unprofitable rail-car operations has been supplanted by bus services. Old types of rolling stock have been replaced either with new cars or by renovating the better class of existing cars. Service betterments have been made possible and operations conducted at noticeably lower costs. Balance sheet improvements have been made that have resulted in obtaining the necessary new money at more attractive rates.

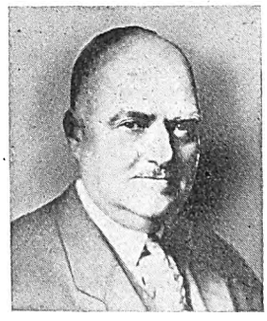
There are still plans that have not received broad acceptance which are bringing satisfying results where operated, said the speaker. The value of an interchange of experience between companies in connection with technical methods is startlingly portrayed in that group of companies whose equipment officials exchange monthly figures and meet frequently for free discussion of their problems. This method of exchanging ideas has brought about economies that are running at an annual figure of about $500,000. At the same time the number of miles operated by each car without necessity of removal from service is so startling as to be almost unbelievable. There is no question but that a similar effort at getting combined experiences for serious adoption on individual properties should be directed to other branches.

The one place where most saving can doubtless be effected, in the opinion of Mr. Storrs, is the transportation department. The failure to increase the average speed of cars is one of the major factors in preventing an increase in business. With higher speed as the goal several properties have made outstanding records even in these days of congested traffic arteries, reaching schedule speeds of more than 11 m.p.h. When one realizes that the average speed in most cities is as low as 9 m.p.h. the incentive for improvement must be apparent, both from the standpoint of economy in lessened car-hour requirements to fill schedules, but even of greater importance, in the increased use of the service. Mr. Storrs concluded:

> It seems to me that we have all been fact-finders, a function of the engineer, until now most if not all the essential facts have been quite clearly defined. Is it not, therefore, time for us to undertake the final constructive task that will lead to the complete solvency and stability of our vitally essential utility? Let us all return to our appointed tasks determined that 1929 shall see us rolling up a still greater record of accomplishment.

Frank R. Coates read the report of the committee on nominations and the convention proceeded to the election of officers.

James P. Barnes, president Louisville Railway, was elected president of the American Electric Railway Association for the coming year. Other officers elected



N. D. Cochran

E. H. Sniffin

were Paul Shoup, San Francisco, first vice-president; J. H. Hanna, Washington, D. C., second vice-president; C. E. Morgan, Brooklyn, New York, third vice-president; G. A. Richardson, Chicago, Ill., fourth vice-president, and Barron Collier, New York, treasurer. J. W. Welsh, New York, was appointed general secretary. R. P. Stevens of New York, the retiring president, becomes junior past-president, vice W. H. Sawyer of New York.

Executive Committee: Operating members, three-year term: H. B. Potter, vice-president United Railways & Electric Company, Baltimore, Md.; W. A. Draper, president Cincinnati Street Railway, Cincinnati, Ohio.

Manufacturer members, three-year term: Carroll Burton, president Lorain Steel Company, Johnstown, Pa.; E. D. Kilburn, vice-president Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; Wm. M. Wampler, president Ellcon Company, New York, N. Y.

In the absence of H. G. Bradlee, his address was read by George H. Clifford, the subject being, "What Are the Financial Results, Achievements and Future Needs of Modernization?" Following this Alonzo R. Williams spoke on the justification of modernization and its financial results so that the addition of capital can be secured for this purpose. Mr. Williams pointed out forcefully that railway men must do aggressive work in modernizing if they are to keep up with the times. W. T. Rossell considered the opportunities of modernization and economies to be effected by mass production. He showed how tracks can be built, overhead line reconstructed and vehicles repaired with the assistance of quantity methods.

Applying modern merchandising and sales methods to

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transportation was the subject of a paper by Charles Gordon. He laid stress on the necessity for modernizing our conception of the nature of our business, but he indicated that no merchandising or advertising can succeed unless the product justifies it. It is futile, he said, to expect that the growth of congestion will serve as a means of driving the public back to the street cars. It is necessary for the railways to provide service of a character the people will be glad to use.

C. F. Kettering spoke on the subject of prosperity and the automotive industry. The term "Modernization," he held, is just a way of saying that changes have not been made in keeping with the normal growth of the demands on the industry. The speaker cited the present status of the automobile industry as illustrative of the value of research in modern business methods, and stated that the purpose of research was to provide ideas a few years in advance of demand for them by the public.

What Others Think of the Industry

The viewpoint of others on the electric railway industry was the general subject of the closing session of the American Association program. The addresses at this session, however, also included the views of a number of men prominently identified with the industry.

Speaking as the head of the editorial activities of the Scripps-Howard newspapers, N. D. Cochran, editor-in-chief *Scripps-Howard News,* outlined the viewpoint of this group of newspapers relative to the general problem of transportation. He dealt particularly with the relations between municipal political governments and public utilities and pointed out that the newspaper, in the interest of the public it serves, attempts to get all the interests to co-operate. He said, in part:

> I believe that any municipality's transportation problem can be solved with justice to all concerned if they go about it in the right way. But some of the old methods will have to be abandoned. Instead of dealing with the public through lawyers, politicians, lobbyists and so-called publicity experts, the transportation system should use practical operating officials in trying to adjust public relations; and their best weapons are candor, fairness, honesty and open-and-above-board dealing. I know this is the best way to approach the average newspaper, and feel just as confident that it is the best way to approach the public. Knowing that transportation experts are human beings like all the rest of us, I think they would prefer to tackle the job in that manner.

Another approach to the general problem of improving transportation service and putting the industry on a sound business basis was made by E. H. Sniffin, assistant to the vice-president, Westinghouse Electric & Manufacturing Company. Mr. Sniffin held that it rests with the street railways of the country to manage the transportation business of their communities. Their money was invested for that purpose, and it is to the interest of all the people and of all business, that this capital be conserved.

The street railways must not remain fixed and isolated from the universal character which city and interurban transportation has acquired, but must embrace it and make it their own. The present competition and duplication and general inefficiency of this service in our cities is a heavier burden on the public than it realizes. In New York City there are something over 20,000 taxicabs, two-thirds of them individually owned and operated. The individual who owns and operates his own cab works twelve to fifteen hours to eke out a bare living.

Mr. Sniffen believes the present seems like a very auspicious time for the railways to take the leadership on this question. The traffic congestion of our streets makes it imperative that a far reaching plan be laid down that will embody something different from the present haphazard and unrelated methods of moving people about. This condition is common to all our cities. The average citizen wonders, as he sees it becoming worse, how much longer we can tolerate it, and is today receptive to a plan of relief. That solution, in his opinion, must come from electric railway experts whose business it is to work it out.

When the railway man is fully prepared to go before his community with a definite plan that will afford adequate service, showing what he can do, and making it plain what the community must do, he probably would have quite a little to tear up before he had a property whose quality and character fitted the modern necessities. When his company is no longer the one that runs some street cars and maybe some buses, but is the transportation company of the town or district, one should expect to see the talent and skill of his organization, no longer shackled and depressed as it now is by its present anomalous condition, rise to its great opportunities.

Other speakers during this Thursday session included E. F. Wickwire, vice-president Ohio Brass Company; P. S. Arkwright, president National Electric Light Association and president Georgia Power Company, who heads the large street railway properties in Atlanta and vicinity. Mr. Wickwire, speaking as the chairman of the committee on co-operation of manufacturers, expressed his views on "some phases of the electric railway situation from the manufacturers' viewpoint." Mr. Arkwright talked on the opportunities for improving the quality of local transportation service. Both of these addresses are abstracted elsewhere in this issue.

The high spots of the association's functions and service to the industry, from a national aspect, were outlined by W. H. Sawyer, past-president and president of Stevens & Wood, Inc., New York City. Mr. Sawyer's address is likewise abstracted elsewhere in this issue.

The Chicago, North Shore & Milwaukee Railroad was designated as the winner of the *Electric Traction* speed contest by G. A. Richardson, vice-president in charge of operation Chicago Surface Lines, who presented the committee's report. In accepting the award for his property, J. R. Blackhall, general manager, expressed his appreciation of the honor conferred and of the effort to stimulate higher operating speed. He said that the public has in recent years been brought to a new conception of speed and that electric railways, if they would grow in public favor, must improve their performance in this as in every other respect. Mr. Blackhall emphasized the part which the employees of his company had played in improving the performance of the property and pointed out that the effort to increase speed on the North Shore property had by no means been made at the sacrifice of safety. On the contrary, he said, the effort to operate faster had been an inspiration to greater caution, with a result that the accident record during the past two years has been markedly superior to that of previous years.

President-Elect Barnes Installed

New officers of the association for the ensuing year were invited to the platform by President Stevens, who in turning over the gavel to President-Elect J. P. Barnes. acknowledged the work that had been done by the several committees of the association and particularly by the group of committees which had handled this 47th convention.

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Themes of Convention Luncheons Momentous

Importance of employee contact in public relations stressed. Merchandising methods discussed—Car financing, traffic, education and safety among other important topics

UP-TO-THE-MINUTE discussions of important subjects made the Round Table Luncheon Conferences a vital part of the A.E.R.A. Convention. Among the outstanding developments in these conferences was that derived from the discussion of employee contact in public relations. Offer the best service you can provide, secure the confidence and the support of every employee and you are certain to develop a friendly public. This was the general feeling expressed by delegates who attended the public relations luncheon, sponsored by W. E. Wood, president Virginia Electric & Power Company.

An unusual contribution was a talk by Mr. Payne, a motorman of the East St. Louis & Suburban Railway, who was called on to give the views of the platform men in public relations work. By request Mr. Wood told of his company's experiences and gave two important points to be remembered in public relations, "first, don't brag about your service unless you have service to brag about; second, get the confidence of your employees."

Closely supporting the developments of the public relations luncheon were the thoughts expressed at the luncheon conference on education, sponsored by Edward Dana. Several speakers obtained best results by getting the men acquainted with problems outside their daily work, but a discussion of operation problems as encountered is most essential. For trainmen the handling of passengers quickly, the use of courtesy and caution and familiarity with equipment are necessary.

Barron G. Collier, original sponsor of the merchandising luncheon, was not present at the convention, but his place was ably filled by W. H. Boyce, commercial manager Pittsburgh Railways. E. B. Sanders, manager commercial department Kansas City Public Service Company, the first speaker, outlined at length the extensive advertising program carried on for the past two years.

J. L. Alexander, general manager Houston E'ectric Company, took charge of the new cars luncheon. It was quite apparent from the experiences related that the public wanted comfort and speed and that if they could not get it from the street railway they would supply their own transportation.

Executive heads of the several principal car builders, together with electrical and air brake manufacturers, participated in the luncheon conference on car financing. Charles Gordon, editor ELECTRIC RAILWAY JOURNAL, acted as sponsor. Discussion by the manufacturers indicated that favorable terms of financing are now available.

G. H. Clifford outlined the experience of the Stone & Webster properties which have installed new equipment during the past two years to replace heavy rolling stock. The effect of the new cars upon riding and upon gross receipts has also covered the carrying charge in some cases. Mr. Clifford said that the installation of this new equipment has helped to convince the public that electric railways are not decadent.

The consensus of opinion at the luncheon devoted to management appeared to be that the time had arrived when more railway properties should undertake the purchase of one or more of the newest cars in order to make of their properties a laboratory for experimenting. The experience of the Brooklyn City Railroad in setting aside in its budget a predetermined amount for research work in co-operation with car manufacturers, was related by C. E. Morgan.

J. P. Barnes, president Louisville Railway, declared that he had been impressed all through the convention with the fact that all discussions seemed to get back to the car problem. If any one department of the electric railway industry has fallen down it has been on vehicles.

General agreement as to how street traffic can be regulated most effectively was evident among the delegates attending the luncheon conference on traffic. Opinion appeared to be unanimous that the progressive type signal is most advantageous, although the reversed synchronous sometimes may be satisfactory.

What is greatly needed now is to convince the public and the municipal authorities of the necessity for adopting traffic regulations and installing efficient control signals. G. A. Richardson explained how this had been done in Chicago.

Discussion at the bus luncheon conference, sponsored by A. M. Hill, developed in lively fashion. Several speakers raised the question of the need for a ticket clearing house, not only in the interest of the operating systems themselves, but for the benefit of their passengers.

Street Railway Commissioner C. M. Ballou of Cleveland said that the original idea was to keep rail and bus lines in Cleveland separate, but that was impossible and unfair. Mr. Sawyer agreed with Mr. Ballou that it was not fair to say that a bus line was a failure where it had replaced a street car line that did not pay.

The fares luncheon was sponsored by W. W. Holden, general superintendent San Antonio Public Service Company. The topics selected were the weekly pass, the nickel pass and zone fares. They were introduced respectively by A. C. Spurr, vice-president and general manager Wheeling Traction Company, W. H. Burke and G. H. Clifford, both of Stone & Webster, Inc. Professor A. S. Richey summed up the discussion by giving a dissertation on the economics of fares.

That electric railway operation in the smaller cities and towns presents problems altogether different from those encountered in the large cities was clearly brought out at the "Small Town" luncheon conference under

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Luncheon Conference Sponsors

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Leslie Vickers
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W. W. Holden

W. A. Jackson

E. J. McIlraith

A. C. Spurr

W. E. Wood

L. M. Brown

Charles Gordon

A. M. Hill

the sponsorship of A. C. Spurr, general manager Wheeling Traction Company. How one small property was revived and made profitable was told by H. E. Wayman, general manager Levis Tramways, Levis, Quebec.

Active discussion was called for by the topics presented at the luncheon conference on manufacturers, at which E. T. Wickwire was the sponsor.

J. P. Barnes, president Louisville Railway, presided at the safety luncheon, at which C. S. Springer of the National Safety Council briefly outlined the program that had been prepared for the annual convention of the council which is to be held next month in New York City. He was followed by Colonel W. V. Bingham, personnel director of the National Research Federation, who related experiences which had developed from a recent study of accident records in Boston and elsewhere.

Considerable interest was evoked at the taxation luncheon conference on the subject of the gross-net tax. After G. G. Brownell explained in considerable detail the provisions of the revenue act of 1928, Chairman W. A. Jackson called on F. W. Doolittle for a discussion of the gross-net tax, particularly as to the bill which was introduced in the Wisconsin Legislature, but which was not enacted. Leslie Vickers spoke briefly on attempts to enact a somewhat similar law in California.

The situation of the interurban lines is desperate, but by no means hopeless in the opinion of a number of representative interurban operators at the interurban luncheon. D. W. Snyder, Jr., vice-president Illinois Traction System, presided. A. W. Brady, receiver Union Traction Company of Indiana, spoke briefly on the efforts his company had made to retain its passenger business and build up its freight. C. H. Jones, general manager Chicago, South Shore & South Bend Railroad, told of the success that had attended the modernization methods that his company had put into effect.

James P. Griffin, vice-president Texas Electric Railway, has modernized the service on his line but this has not stopped the decline of passenger business. Recently an intensive drive for freight has met with considerable success. J. R. Blackhall, general manager Chicago, North Shore & Milwaukee Railroad, stated that on his property modernization of passenger equipment had reduced operating expenses and pulled the road out of the "red."

Pick-up and delivery was the principal topic at the freight luncheon, presided over by L. M. Brown, vice-president Interstate Public Service Company, Indianapolis. He called on H. A. Nicholl first, general manager Union Traction Company of Indiana, who explained how the competition of motor trucks had cut deeply into the business. M. B. Lord, vice-president and general manager York Utilities, Sanford, Me., described a successful store-door delivery system in effect on that property. James P. Griffin, vice-president Texas Electric Railway, told of the pick-up and delivery service on his property which had resulted in a substantial increase in revenue.

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Virginia Electric & Power Company Wins Coffin Award

1928 prize goes to Stone & Webster property in old Virginia, at Advisory Council meeting. B. C. Cobb, chairman, reviews industry's situation. Owen D. Young stresses economic and social importance of solving the local transportation tangle

PERHAPS the most coveted honor in the electric railway industry, the Charles A. Coffin Award, was presented for the year 1928 to the Virginia Electric & Power Company, in recognition of its accomplishments toward improving local transportation for the convenience and well-being of the public and for the benefit of the industry. The award was presented by President R. P. Stevens at the Advisory Council meeting at the Cleveland convention on Tuesday night. W. E. Wood, president of the winning property received and acknowledged the award in the name of his company and employees.

B. C. Cobb

In its report, the Coffin Award Committee epitomized the accomplishments of the winning road. Through demonstrated efficiency and confidence won by fair dealing, this property converted a former bitter public in several closely associated communities to an attitude of friendly co-operation. As a result, extended and complicated franchise controversies that had existed for a number of years were settled. Bus and trolley service was co-ordinated, extended improvements were made in facilities, and an intensive merchandising program was conducted which, in turn, led to an increase in the number of passengers carried by both street cars and buses, increases in gross and net revenue, and in the return on the investment in the property.

Accomplishments by this property extended beyond merely operating improvements. Through corporate consolidation the number of subsidiaries was reduced. The financial structure was simplified and strengthened, and local financing was made less expensive. With capital thus available new and modernized equipment was provided; and finally employee co-operation was enlisted and favorable financial results achieved for the entire program.

Six Contestants in 1928 Competition

A total of six properties competed for the 1928 award. This was the sixth successive annual contest for the medal which is donated annually by the Charles A. Coffin Foundation, established by the General Electric Company, "To that electric railway company in the United States which during the year has made the greatest contribution toward increasing the advantages of electric transportation for the convenience and well-being of the public and for the benefit of the industry."

In addition to the medal to the winning property, the award includes the sum of $1,000 for its employees' benefit or similar fund.

The committee pointed out in its report that during the six years that this contest has been in effect its benefits have been far-reaching. It has been the means of bringing to the attention of the entire industry the step by step improvements made by individual properties in their readjustment to meet the far-flung changes in the conditions under which the industry's operations are conducted. The successes achieved by each property have served as stimulating examples to others, with the result that since this contest was established there has been a marked acceleration in the entire industry's progress.

During the six years of the Coffin contest, a total of 64 briefs have been submitted by 48 different companies. In 1923, the first award was won by the Chicago, North Shore & Milwaukee Railroad. In succeeding years the winners were as follows: 1924, the Northern Texas Traction Company; 1925, the Pittsburgh Railways; 1926, the Pennsylvania-Ohio Electric Company; 1927, the Grand Rapids Railroad.

The six contestants this year included the El Paso Electric Company; Gary Railways; Northern Texas Traction Company; San Antonio Public Service Company; Shreveport Railways and the Virginia Electric & Power Company, the winner. The Northern Texas Traction Company, of Fort Worth, Texas, which was the winner in 1924, has continued to be a contender each year. The El Paso Electric Company participated in the contest for 1923, 1925, 1926 and 1927. The Shreveport Railway was a contestant in 1924 and the winner in 1927.

Five of the six contesting companies listed are located in the South, three being in Texas. It is noteworthy that of these six companies, three are under the executive managment of Stone & Webster and one of them was a previous winner in the contest.

Several of this year's contestants showed evidence of major accomplishments which were cited by the committee in its report. The El Paso Electric Company succeeded in developing satisfactory service under the difficult conditions presented by the requirement of dealing with people of two nations and two languages. It increased its net revenue in the face of severe automobile competition under climatic conditions favorable to maxi-

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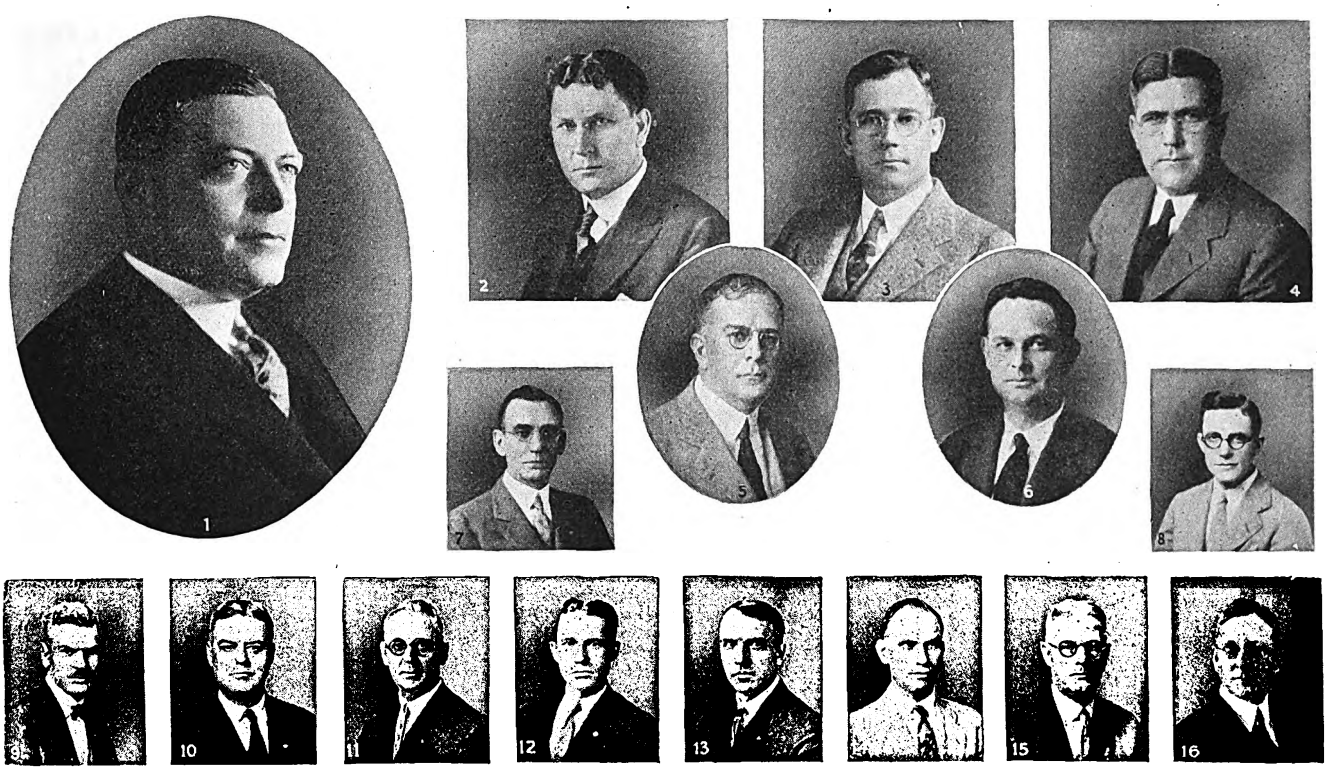

Executives and Departmental Chiefs of the Virginia Electric & Power Company

1—W. E. Wood.
2—G. H. Clifford
3—Tom P. Walker
4—J. Frank McLaughlin
5—T. Norman Jones
6—J. M. Penick
7—V. W. Berry
8—A. H. Herrmann
9—J. B. Hayes
10—H. Pollard
11—E. A. Bishop
12—F. Carter Womack
13—J. C. Newman
14—J. T. Porter
15—T. W. Madison
16—John Y. Bayliss

mum automobile usage. Improved service was established through the operation of new and modernized rolling stock. In its safety work the record of 1926 was bettered, in which year it won the Anthony N. Brady Safety Medal.

Feasibility of one-man cars was successfully demonstrated by the Gary Railways. This property succeeded in bringing its operating costs down to a low figure despite a relatively high wage scale. Improved service was developed through the application of new rolling stock and the modernization of older cars. Rail and bus service was co-ordinated. Public relations were improved, and a simplified and strengthened financial structure developed. Employee morale was built up and 100 per cent of the employees are owners of the company's stock.

A winner of one Coffin Award and a competitor six times, is the enviable record now established by the Northern Texas Traction Company. This property increased its revenue through a new and equitable fare structure. Operating costs were held at a low figure.

In the city of San Antonio, the San Antonio Public Service Company co-ordinated car and bus service for serving a population of 265,000 spread over 65 square miles. In this process it established sound economic principles of transportation merchandising as the basis for rendering a complete transportation service to a growing community. A well-worked out zone system combined with tickets and a nickel pass provides an example of scientific fare structure almost unusual in the industry. Service was improved with higher car speed and by close supervision of operation by a telephone dispatching system which permits a central dispatching office to keep in close touch with every operating unit on the street. All of these activities increased revenue and public satisfaction.

New and modernized cars operated on good tracks in Shreveport, and maintained on frequent and regular schedules, helped the Shreveport Railways to develop improved service. The accident cost on this property is very low. Public co-operation was won through demonstrated efficiency and friendliness. Jitney competition was eliminated.

One of the important events of the evening meeting of the Advisory Council was the report by B. C. Cobb, its chairman, abstracted elsewhere in this issue. He held that the greatest immediate need of the industry is increased travel and was hopeful that this would shortly be the result of the efforts to stimulate traffic which have been made during the past seven years.

An outstanding feature of this year's Advisory Council program was an address by Owen D. Young, which is also abstracted elsewhere in this issue. Mr. Young held, first, that the business of local transportation should be a monopoly, publicly regulated as to rates and service, with a fare adequate to attract private capital if such fare can be obtained. The second principle enunciated by Mr. Young regarding the local transportation industry was that it should be conducted under private ownership in all cases where it can meet the needs of the community. Finally, the local transportation company, whether it be publicly or privately owned, should use the means best adapted for the most efficient and economical transportation of the public which it serves. The speaker declared that he held no brief for the use of electricity. Research and engineering under the impetus of a new spirit in the light of a pressing need, should be drafted into service to redeem an industry and an art which has been able to survive during the last fifteen years only by reason of the courage and determination of the men who have administered it.

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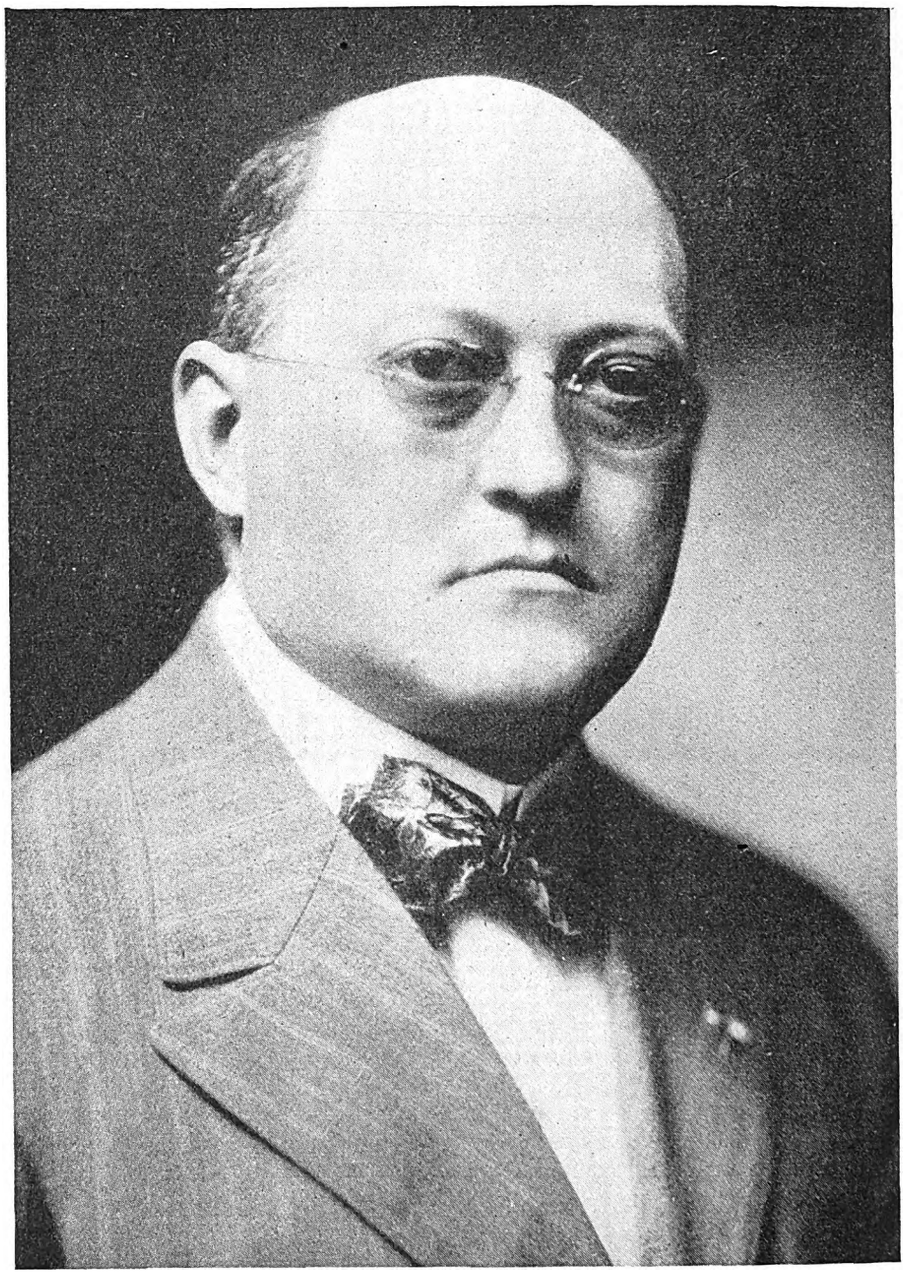
James P. Barnes

Newly Elected President A.E.R.A.



JAMES PHILIP BARNES, newly elected president of the American Electric Railway Association, has long been an active worker in the interests of that body and various state and sectional associations. Before his election to the presidency of the American Electric Railway Association at the convention just ended Mr. Barnes served for four years as vice-president, advancing successively from fourth vice-president to first vice-president year by year. He has served on many of the important committees of the association, including the executive committee and the committees on policy, Coffin award, convention contract, convention location, subjects and meetings, public speaking and industrial relations. He has also served as president of the New York Electric Railway Association in 1916. In 1923 he was president of the Central Electric Railway Association. Two years later he was elected president of the Kentucky Association of Public Utilities.

Mr. Barnes assumed his present post of president of the Louisville Railway in 1920. He has had to contend against tremendous odds there, but the record of his accomplishments stands well revealed in the rehabilitation of the physical property there, the return of the company as a dividend payer, the co-ordination of car and bus, the passage of a modified operating grant, the organization of the "Cardinal Flyers" and the winning by his company of the Brady safety award. While he and his associates in the company were doing all these things, Mr. Barnes has made himself a real factor in local community activities.

Mr. Barnes was born at Syracuse, N. Y., Jan. 26, 1881, and was educated in the public schools of that city. After he was graduated from high school he attended Syracuse University for two years as a special student in music. Then he entered the Massachusetts Institute of Technology from which he was graduated in 1905 with the degree of bachelor of science in electrical engineering.

Following his graduation from M.I.T. he spent nine months with Pass & Seymour in Syracuse, as a designer of electrical apparatus. The lure of transportation soon caused him to leave that occupation, however, and he joined the engineering staff of the Oneida Railway. During the six years he spent with this company he took an active part in the electrification of the West Shore Railroad between Utica and Syracuse. In 1908 he became electrical engineer for the Syracuse Rapid Transit Railway. While associated with the latter company he was responsible for the layout and construction of its Wolf Street shops. When the New York State Railways took over the Syracuse Rapid Transit Railway in 1912 Mr. Barnes remained as chief engineer of the consolidated lines.

In 1913 he transferred his activities from the engineering to the operating end of the electric railway business and became general manager of the Syracuse & Suburban Railroad, operating an 18-mile line to Fayetteville and Manlius. Subsequently, he occupied the position of general manager with the Buffalo, Lockport & Rochester Railway and with the Schenectady Railway. As stated previously his connection with the Louisville Railway began on July 1, 1920.

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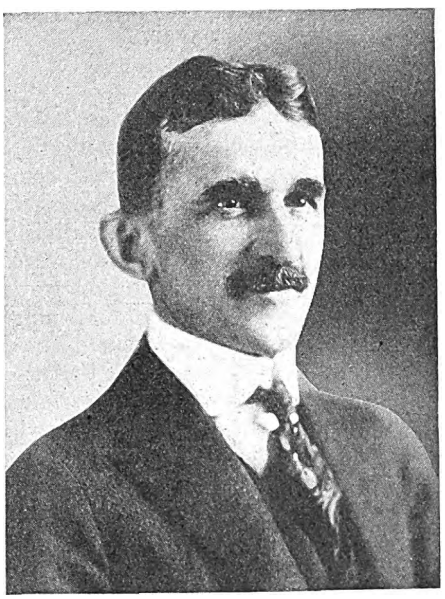
Engineers Are Seeking More Efficient Methods

Speeding up track construction, improving design of bus garages, economies of labor saving machinery in shops, energy saving by resistance heating and dynamic braking were subjects of lively discussion

BETTER engineering methods were the prime consideration of the delegates and speakers at the 47th annual convention of the American Electric Railway Engineering Association, held at Cleveland Sept. 22-28. On Monday and Wednesday separate meetings were held by the power, way and structures, purchases and stores and rolling stock divisions. On Thursday a general meeting of all engineering divisions was held. While the topics discussed by the various committees and speakers covered a wide range of subjects, the dominant note was the necessity of attaining greater efficiency in the work of the power, track, rolling stock and stores departments.



R. H. Dalgleish

The present year is the first during which the Engineering Association has functioned in four divisions. A start was made in this direction in 1926 by the creation of the standing committee on way and structures with numerous special committees to study individual subjects. Last year a similar change was made in the rolling stock division. The same plan has now been extended to the entire association. From the experience of the last three conventions, it appears that this reorganization has been eminently successful. The present method of voting on standards by letter ballot, inaugurated at the same time as the new committee system, eliminated much of the routine work which formerly occupied valuable time at the convention sessions.

New officers of the Engineering Association were elected at the Thursday afternoon session. They are:

President, Frank H. Miller, vice-president and general manager Louisville Railway.

First vice-president, W. W. Wysor, chief engineer United Railways & Electric Company of Baltimore.

Second vice-president, L. D. Bale, superintendent of power Cleveland Railway.

Third vice-president, Charles H. Jones, general manager Chicago, South Shore & South Bend Railroad.

In addition to these the executive committee will consist of P. V. C. See, superintendent of power and equipment Northern Ohio Power & Light Company; F. McVittie, electrical engineer New York State Railways, Rochester; E. M. T. Ryder, way engineer Third Avenue Railway, New York; Howard George, superintendent of research, Cleveland Railway.

Economies to be effected by the use of labor-saving machinery was the theme of the general meeting of all engineering divisions held Thursday afternoon. A paper on this subject by W. T. Rossell, general manager Pittsburgh Railways, is published in abstract elsewhere in this issue. W. G. Gove, superintendent of equipment Brooklyn-Manhattan Transit Corporation, opened the discussion of Mr. Rossell's paper. He told of the methods used by the rapid transit companies in London, Paris and Berlin and also described in considerable detail the new shops recently built by his company. It was his contention that inspection and maintenance work should be done better than is customarily the case and that there should be less tampering with equipment after it has been overhauled and placed in service. A viewpoint somewhat different from that of Mr. Rossell was presented by J. B. Stewart, general manager Cincinnati Street Railway, who expressed the opinion that line production methods for maintaining street railway rolling stock are not altogether satisfactory.

In opening the meeting President Dalgleish complimented the busy men of the association for the attention they had given to the solution of the many perplexing problems confronting the industry. The reports of the committees this year, he said, contain much interesting information that is of value to all. He also congratulated the program committee on its excellent work. According to the president, new types of equipment and new drives for street cars are steps in the right direction that eventually will produce a car that is not only attractive and comfortable, but that will operate quietly over the well-built track now being installed by many of the railway companies. Power and distribution have also shown improvements. The work of the association he feels is of benefit to the railways as it is enabling them to make riding on street cars more popular. Attention also was called to the motor bus and the problems it has brought with it in order to secure the maximum advantage.

"We have a great deal to learn about buses and their operation," said Mr. Dalgleish, "and it is only by the

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hearty co-operation of all of us that the best results can be obtained. I cannot too strongly recommend your co-operation with the association in an effort to solve some of the problems in connection with bus operation."

The reports of the executive committee and of the secretary-treasurer were read. In the absence of W. W. Wysor, chairman, F. H. Miller presented the report of the committee on constitution and by-laws. An abstract of this report is published elsewhere.

The report of the committee to co-operate with the American Engineering Standards Committee was read by G. C. Hecker. This outlined briefly the changes which have been effected in the organization of the American Standards Association during the past year.

A resolution was passed by the meeting extending the sympathy of the Engineering Association to Past-President L. C. Datz, on account of the recent tragic death of his son.

The meeting concluded with the installation of the new officers for the coming year and the presentation of the past-president's badge to Mr. Dagleish. Mr. Miller, the incoming president, expressed his appreciation of the honor shown him by the association and asked for the co-operation of all the members during the coming year He spoke particularly of the need of interesting young engineers in the work of the association.

Way and Structures Division

Presentation of the report of the standing committee and the reports of the various special committees were made at the Monday afternoon meeting of the way and structures division. H. H. George, chairman of the standing committee, outlined briefly the work that had been done by the division during the year and explained the status of the reports of the several special committees. The special committee on track ballast and drainage did not find it practicable to make any very definite recommendations. The results of its study were explained by S. Clay Baker, chairman. In the absence of Chairman Adrian Hughes, Jr., the report of the special committee on bus garage design was presented by A. J. Blackburn, architect, Boston Electric Railway. An abstract of this report is given elsewhere.

In discussing this subject, R. C. Cram recommended that careful consideration be given by the committee to the matter of garage lighting.

Co-operation between the special committee on track construction specifications and the American Society for Municipal Improvement was discussed by C. L. Hawkins, chairman. The reports of the special committees on alloy steel for special trackwork and track paving were not completed in time to receive the approval of the standing committee prior to the convention. For that reason they were not officially presented but the progress of the work was outlined by the chairmen, A. T. Spencer and A. E. Harvey. In the absence of L. A. Mitchell, chairman, Mr. George read the report on special trackwork foundations. C. F. Gailor, chairman of the special committee on arc welding, told of the work being carried on in co-operation with the American Welding Society. No reports were presented by the committees on joint railway and bus terminals and track checking gage.

A lively discussion followed the presentation of the report of the special committee on rail corrugation. In the absence of W. W. Wysor, chairman, this report was read by D. D. Ewing. An abstract of this report appears elsewhere.

The relative merits of the flat-head rail slightly canted and the round-head rail were discussed by C. H. Clark, R. C. Cram, A. T. Spencer, E. M. T. Ryder, J. H. Haylow, Roy Brokaw and H. H. George. There was general agreement as to the desirability of securing the greatest possible area of contact between the wheel tread and the rail head. No agreement was reached, however, as to the means by this object can best be accomplished.

The meeting was briefly addressed by R. H. Dalgleish, president American Electric Railway Engineering Association. He spoke of the enthusiasm with which the committees of the association have attacked their problems during the past year and of the good work accomplished. A resolution was passed extending the sympathy of the way and structures division to E. B. Entwistle, who was prevented by illness from attending the convention this year.

Way and Structures Division

Problems of track construction, particularly those connected with the maintenance of rail joints and special trackwork, occupied the attention of the members present at the Wednesday afternoon meeting of the way and structures division. Recent developments in arc welding rail joints were described by H. C. Heaton, superintendent of tracks United Electric Railways of Providence. An abstract of this paper appears elsewhere in this issue. The discussion was led by J. H. Haylow, who spoke of the experiences of the Memphis Street Railway. Use of the bolted rail joint in paved track was the subject of a paper by B. P. Legaré, engineer maintenance of way and construction Market Street Railway, San Francisco, which was read by Chairman H. H. George. Mr. Legaré's paper appears in abstract elsewhere. R. C. Cram, Third Avenue Railway, New York City, led the discussion.

Speaking on Reduction of Noise in Special Trackwork, P. B. Harris, manager engineering, Los Angeles Railway, said in part:

> The Los Angeles Railway has carried on numerous experiments and tests to reduce noise from special work. Either the rails were raised or other methods employed to give the car a through rail over special work. We have tried cushioning the intersections by having the centers made deep and not fastened but free to work up and down and at the same time resting upon a cushion of rubber or other shock absorbing material. Although we developed a very successful type we did not get the results desired.
>
> We have found that we can accomplish noise reduction best by: (1) using flange-bearing special work that is kept up in the very best possible condition; (2) allowing no loose or uneven joints; (3) allowing no low or beaten down centers. The arc welder has done much toward helping out this problem. Wheels with as wide a tread as possible should be used, as these save the wear on special work.
>
> Good conditioned special work and cars must go together if we are to get results. Poor special work will soon make noisy cars, and cars with bad wheels and loose trucks, etc., won't help your special work.

How track construction work can be speeded up was told in a paper by Oscar Williams, superintendent of way and structures Pittsburgh Railways. An abstract of this paper appears elsewhere. In discussing this subject, H. F. Merker, Brooklyn City Railroad, brought out the fact that it is frequently desirable to have track construction done by outside contractors.

Prior to the reading of these papers, reports were presented by three special committees; namely, those on engineering manual, wood preservation, and rail markings.

The report of the special committee on special track-

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work was not officially presented because the work of the committee had not been completed in time to be passed upon by the standing committee prior to the convention. E. M. T. Ryder, chairman of the special committee, briefly outlined what had been done.

Bus garage design evoked lively comment. A paper on this subject by H. M. Steward, superintendent of maintenance Boston Elevated Railway, was read by A. J. Blackburn of the same company. An abstract of Mr. Steward's paper appears elsewhere. John Ross, Department of Street Railways, Detroit, Mich., and C. R. Harte and A. D. Knox of the Connecticut Company, participated in the discussion of this subject.

President Stevens of the American Association dropped in at the meeting and spoke briefly on the good work being done by the Engineering Association.

The A.E.S.C. sectional committee on specifications for materials for use in the manufacture of special trackwork and design of 7-in. plain girder rails for use in paved streets presented a report to the American Electric Railway Association which is the sponsor body. This report contains specifications for special trackwork materials. The committee recommended that the specifications as presented be approved by the sponsor body, and following such approval the specifications together with the complete report be submitted to the American Engineering Standards Committee for approval as tentative American specifications.

Rolling Stock

Improvements in rolling stock that give promise of bringing back lost car riders were stressed particularly in reports and discussions at the first meeting of the rolling stock division of the Engineering Association. President Dalgleish said in his address that this was the greatest problem to be solved. Better lighting arrangements and increased illumination was reported as one means of attracting riders, the use of more comfortable seats was another, and a third and most important one that of reducing noise.

The report of the committee on noise reduction brought out a large amount of discussion showing the great interest that is being taken in this important subject. The committee reported on tests of one car where the noise as recorded inside the car was reduced 47 per cent by changes in gearing, use of padding on gear cases and under flooring, use of rubber mounting for trolley base and the substitution of resilient wheels for the standard rolled steel type. The reduction of noise on the same car was 18 per cent as observed from the street curb when the car was passing.

In addition to the written report, presented by various chairmen and abstracted elsewhere in this issue, a number of committees presented verbal reports of progress. These contained no recommendations for action and were received only as progress reports. One which was of particular interest was that of the special committee on car design. H. H. Adams, chairman, told of the work being undertaken in its study of different units of gearing. A number of these are now ready for testing by the Bureau of Standards in Washington, and it is thought that the first equipment will be tested during the next month. A sub-committee of this committee has been making a study of the economics of the high-speed motor. A number of installations with the new type of gearing are now in service and these are being studied.

Improved lubrication and trends in car design were discussed by the rolling stock division of the Engineering Association at its second meeting. Investigations and tests on lubrication as made on the cars of the United Railways & Electric Company, of Baltimore, were described in a paper by Dr. W. B. D. Penniman, consulting chemist, Baltimore, Md. He advocated the use of lubricants with low viscosity and high oiliness. An abstract of this paper will be published in a later issue.

In the discussion on lubrication, H. H. Adams, of the Chicago Surface Lines, told of tests made on his property during the past nine months with oil having a viscosity of 56. There was a decrease in general bearing temperature of 57.8 per cent and a decrease in kilowatt-hours per car mile of 7.15 per cent. He summarized the advantages of using a low viscosity oil as (1) more free moving of equipment; (2) lower bearing temperatures; (3) less wear of bearings; (4) better and longer life for waste; and (5) less energy consumption. Mr. Adams recommended trial installations of low viscosity oil before changing over an entire system.

John Lindall, of Boston, referred to some things that increase power consumption in cold weather. He said that dragging of brake shoes is more prevalent at low temperatures. Air brakes function slower, curve friction and wind friction is greater, and more passengers are carried. He considers the development of a bearing seal as described by Dr. Penniman as an important development, as it is very essential to keep dirt and water out of bearings.

J. S. McWhirter, of the Third Avenue Railway, New York, emphasized the necessity for keeping oil and bearings clean, and provision so that oil would be applied at the proper points. He referred to the splash method of lubrication which has been tried out on some European properties and to a design which he has worked up which consists of a wedge key to tighten and hold the bearings.

Future rolling stock must be quiet in operation, smooth and pleasant to ride in. It must be comfortable, convenient and easy to use. It must meet the automobile on its own ground. Charles Gordon, editor of Electric Railway Journal, thus summed up present trends in car design in a paper distributed at the Wednesday session of the rolling stock division but not read due to lack of time. An abstract will be published in a later issue of this paper.

Power

More than 80 power and line engineers assembled on Monday afternoon for the opening session of the Power Division, presided over by W. E. Bryan, superintendent of power St. Louis Public Service Company. The meeting was characterized by the prepared and lively informal discussions of the several reports. Following the report of the standing committee on power, presented by Chairman Bryan, the reports of the following special committees were presented: mercury vapor power rectifiers, power contracts (progress report), trolley wire wear, radio interference, overhead vs. underground feeders (progress report) and trolley voltage in congested districts (progress report). A feature of the program was an address by the president of the Engineering Association, R. H. Dalgleish, who referred to the great interest being shown in the various Engineering Association divisions and urged that all members who are asked to serve on committees accept the assignments.

Three important papers and five committee reports were presented at the meeting of the Power Division of

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the Engineering Association held Wednesday afternoon. "Automatic Substation Installations in Cincinnati" was the subject of a paper by Harley L. Swift, superintendent of substations Cincinnati Street Railway. He described in detail the installation of the nineteen automatic substations and gave some interesting construction data. L. D. Bale of the Cleveland Railway supplemented the paper and emphasized three important features of the system, the supervisory control, the attractive buildings and the reduction in labor costs. F. W. Peters of the General Electric Company spoke on the important elements in the design of this system.

The second paper, presented by A. W. Baumgarten, division engineer Chicago & Joliet Electric Railway, concerned the energy-saving effects of resistance and dynamic braking heating. He outlined the advantages of dynamic braking and told of the work that had been done on the Joliet property. He supplemented this information with actual results of the system, which showed that real savings could be effected. Prepared discussions of this paper were given by W. C. Wheeler of the Chicago Surface Lines and W. A. Keller of the Pittsburgh Railways, who told of their experiences in car heating on their property. Mr. Wheeler discussed the need for construction detail and thermostatic control for reducing car heating costs.

Dwight L. Smith, electrical engineer Chicago Rapid Transit Company, presented the third paper, entitled, "Inspection vs. Repairs." He emphasized the necessity of inspecting inert objects as well as moving ones and stated that regular inspection properly carried out and followed up by necessary repair work will result in a reduction of failures in operation, a decrease in accident liability, an increase in the useful life of the property and the ability to make more accurate budgets. Mr. Smith's paper was discussed by J. F. Neild.

The five committee reports presented were engineering manual, catenary specifications, standardization of trolley wire reels, conduit specifications and ferrous vs. non-ferrous materials for overhead. Prepared discussions were given for each report.

Purchases and Stores

Monday's meeting of the Purchases and Stores Division was opened with an address by President R. H. Dalgleish—in which he showed his particular interest in the work of the Purchases and Stores Division. He pointed out that the purchasing agent can help reduce the cost of the work of the engineers by scientific buying. By scientific buying, he explained that the purchaser should get the best material for the price, but it is a question of quality more than price. There is a need, he said, for the younger men to take a more active part in the committee work.

In a paper on standard packages prepared by W. E. Scott, superintendent of supplies Philadelphia Rapid Transit Company, Philadelphia, Pa., the fact was brought out that there seems to be a majority opinion that the present methods of packing are obsolete, inasmuch as either weights or quantity are of such proportion that they prove very expensive due to the large quantities that must be bought to secure unit packages, or the additional handling costs involved if purchased in broken containers. Several have pointed out that in some instances containers weighing in excess of 200 lb. are received, and in the handling of material that is loose, through purchasing large bulk quantities, a potential loss of material is likely in the distribution within the organization. The consensus of opinion seems to be that material should be packed in standards of smaller quantities than now exist and container weights limited to a 100-lb. minimum.

Shall there be determined a standard package unit to be governed only by weight or bulk, or only by quantity, or must these three factors be considered.

When one considers that the number of items of material purchased and used by a group on small properties average 3,000 and on the large properties 30,000, and that some member companies have allied utility interest, whereby the total number of items is doubled and even tripled, the problem becomes more difficult and because of that more important to solve definitely.

A. L. Fisher

R. A. Weston

W. E. Scott

It is now hoped that since this work has been considered of sufficient importance to be assigned as a subject for committee planning and discussion, every effort will be made by the individual members to express themselves at sufficient length to give the benefits of their views to the committee members, and through them, the association shall actively assume an obligation to express these thoughts and views to the Department of Commerce, thereby effecting an economic result that will be far reaching and not restricted to only a few of the properties affected.

The committee in its final summing up is faced with the problem of determining which feature of the work should be eliminated, and from such elimination achieve the greatest result, not only to the manufacturer of the material, but also to the user of the material. The final result must be one of such nature, that it will give the greatest economic value in which both the maker and the user of the materials can equally participate.

If the individual members could but realize that work along these lines would accomplish price reduction through medium of manufacturers' reduced packing cost and elimination of waste in container varieties; lower handling costs by purchaser through elimination of varied containers, both in weight and unit lower cost through standardization of containers, making possible easier check of material, it is certain their co-operation with the committee would be full and complete.

In a written discussion by W. J. Walker the subject of standard packages was brought up from the manufacturers' viewpoint. In the general discussion A. A. Ordway stated that some manufacturers are offering material in bulk at reduced prices. Taking this into consideration, he wished to know how much the manufacturer would

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charge for packing and if it would save money to resort to standard packages.

A. E. Hatton, West Penn Power Company, replied that he believed manufacturers would be able to put their material in standard packages on a production basis. The saving in checking quantities both by the manufacturer and the railway usually would pay the cost of the standard packages. He stated that his company spot-checked all standard packages received, and in his recollection there had been no instance of a short count.

A. B. Gibson, Westinghouse Electric & Manufacturing Company, stated that manufacturers are trying to get packages of convenient size for railway use and find that some railways wish small quantity packages while others which purchase large quantity lots object to the large number of boxes in each shipment. He emphasized the work of the committee on standard packages in establishing a suitable standard of quantity. George A. Cooper of the Department of Commerce offered the co-operation of the Division of Simplified Practice.

"Inactive Stock" was the title of a paper by A. S. Duncan, assistant director of finished stocks, Westinghouse Electric and Manufacturing Company. A very complete and effective method of handling and penalizing inactive stocks was outlined. In a written discussion by A. E. Hatton it was brought out that by this method of penalizing inactive stocks the losses are easily taken step by step and that it allows for the elimination of materials which do not turn over.

Relation of the purchaser to the stores department was the title of a short address given by A. L. Fischer, purchasing agent Cincinnati Street Railway, Cincinnati, Ohio. He brought out the fact that the purchaser derives his usefulness in being able to centralize, that is to group and classify, and in being able to visualize, that is to look ahead provided he is placed high enough to do this. Formerly mercantile and manufacturing concerns and even public utilities, had each department head act as his own buyer. This method however led to much waste and duplication, so that skilled buying is now done by one man who knows not only the needs of one, but all departments in his company.

The purpose of a stores department in its simplest analysis is (1) to have supplies on hand when needed, (2) to administer these supplies so as to prevent duplication, waste, depreciation and obsolence and (3) to procure supplies to the best advantage. The first two purposes are functions of the stores officer. The third purpose is the function of the purchaser.

The purchaser, it seems, is the provider, and could be likened to the head of a family. The storekeeper is the distributor of the supplies provided. As all well regulated families succeed by working in harmony, so should purchaser and storekeeper work in closest co-operation.

The 1927 report of the purchases and stores committee recommends that the departments of purchases and stores should be co-ordinated so as to operate as a unit. This can be accomplished, it goes on to state, by having a supervising officer who is responsible for both.

Getting down into detail, if the requisition, the invoice, and the tracer are considered the authority for stock they are found to be bridges, as it were, that connect the two departments, and make for the closest co-operation.

The purchasing officer will watch the investment in stock, the rapidity of turnover and the cost of handling supplies in which the storekeeper should give him the closest co-operation. While a monthly report showing balance on hand with receipts and issues is usual, it would not be a difficult matter to have a daily report if such were found to be necessary.

It is unfortunate that the purchasing and stores departments too often operate as separate units. A remedy for this condition is to have a director or a supervisor of purchases and stores, who will be responsible for both departments, or in the case of smaller companies to have the storekeeper report to the purchasing agent, who will account for both departments.

In the absence of Mr. W. S. Stackpole, his paper on handling supplies for Buses, was presented by C. A. Harris. A complete description was given of the handling of supplies for buses and other automotive equipment, and the marked differences between handling these supplies and those for electric railways were pointed out. The remarks in this article were confined to operations where a large percentage of vehicles were automotive. A written discussion by J. T. Foster was read by A. S. Duncan.

Joint Session

The joint session of the Purchases and Stores Division and the Accountants' Association held Wednesday afternoon opened with the reading of the report of the standing committee on purchases and stores and the committee on stores accounting by John Y. Bayliss, covering the joint work of the two committees.

John Fleming, chairman of special committee No. 1, Engineering Manual, then gave the report of that committee, which included a revision of the recommended method of handling freight and express bills at present in the 1926 report of the purchases and stores committee. It also was recommended that the simplified invoice form approved by the 1927 committee on purchases and stores be included in the Engineering Manual as the recommended form. Revisions were also made in Manual section P.S. 100-24 and section P.S. 106-27.

In the absence of W. E. Scott, chairman of special committee No. 2, unit piling and standard packages, A. S. Duncan gave a progress report.

Progress was also reported by C. A. Harris, chairman of committee No. 3, Investment in materials and supplies and the cost of operating stores and the committee on stores accounting, whose chairman is R. A. Weston. Recommendations of these committees were in accordance with a number of questionnaires sent out to operating companies during the past year.

Special committee No. 4, price records and pricing materials and supplies, presented through A. A. Ordway, chairman, a tentative report for the consideration of recommendations of methods and practices for keeping price records and pricing materials and supplies received and issued.

"The cost or price of materials," said R. A. Weston, special accountant, of the Connecticut Company, New Haven, Conn., "should logically include all the expenses connected with the same up to the time of use. It is, however, impracticable to include all these costs in the unit price of material items and some other method is necessary. With overhead expenses eliminated no troublesome questions arise in the pricing of new materials purchased." Mr. Weston outlined three methods for storeroom pricing, the lot, average price and latest representative price methods. He also discussed the necessity of tieing the description of each item with its price, the pricing of second-hand material, the listing of used and repaired bus assemblies and the attitude of departments with respect to using second-hand materials.

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Frank H. Miller

NO MNEMONIC devices are necessary to bring to mind the name closely tied in with J. P. Barnes in his progressive transport policies in Louisville, Ky. His associate and co-operator in that work is Frank H. Miller, elected president of the Engineering Association, 1928-1929. When in the early part of 1925 the title of general manager was conferred upon F. H. Miller, the first official of the company to be so designated, it must have made him reminiscent of a day 33 years ago when he started in the car repair shop of the company, and successively occupied the positions of timekeeper, storeroom man, car tester, truck repair man, assistant shop superrintendent, superintendent of wire work, and superintendent of power stations.

When eight years ago Mr. Barnes took over the presidency of the Louisville Railway, Mr. Miller became vice-president in charge of engineering and maintenance and in 1925 was made vice-president and general manager, for this practical operator had real achievements to his credit.

Mr. Miller was born in 1874, near Louisville. He was graduated from Rose Polytechnic Institute in 1895, and afterwards, through post-graduate work at Rose, took the degree of electrical engineer and later mechanical engineer.

F. H. Miller

W. H. Boyce

William H. Boyce

WILLIAM H. BOYCE, the new president of the Transportation and Traffic Association, obtained first-hand contracts with the every-day man as a meter reader and a motorman. His first real executive position came in 1909 when he was made superintendent of the Beaver Valley Traction Company. Soon he became one of the most influential citizens of the community as a "joiner" and a good doer.

Even in those days, Mr. Boyce was a strong believer in what has now become known as "public relations," "safety first" and "riding salesmanship." And what he preached he practised successfully on the Beaver Valley property.

As general manager during the World War years, he secured one fare change after another after giving every possible consideration to the views of his customers. Eventually he developed a plan of 5-cent short haul fares and weekly passes.

His big opportunity came with the reorganization of the Pittsburgh Railways early in 1924. As the Beaver Valley Traction Company was also a member of the Philadelphia Company group, the directors were well acquainted with his extraordinary success as an administrator and public relations man, and he was made commercial manager.

The record of the commercial department of the Pittsburgh Railways has proved that the Boyce system works just as well in a big city as it did in the Beaver Valley.

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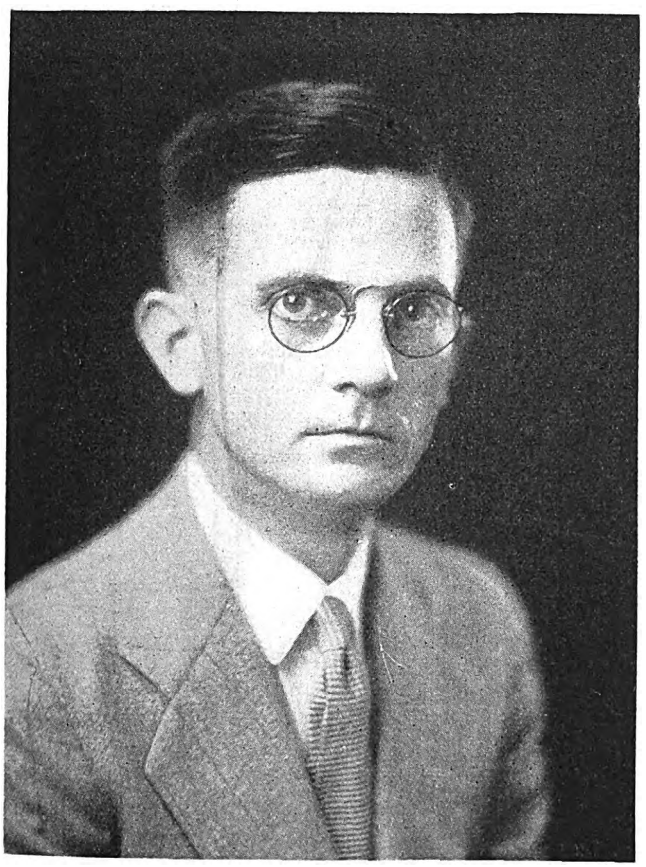
L. F. Wynne

ONE might characterize the experience of L. F. Wynne, elected head of the Claims Association 1928-1929, as more intensive than extensive, for he has confined his activities to Georgia and more particularly to Atlanta, its principal city. There he was born on March 11, 1884, and there he became affiliated with a utility which was to offer him many opportunities for constructive work in the claims department.

Early in his career Mr. Wynne was graduated from law school, and on Dec. 26, 1905, entered the service of the Georgia Railway & Electric Company, owner and operator of the railway lines in Atlanta. Six years later he was made general claim agent. In 1912 the Georgia Railway & Electric Company was taken over by the Georgia Railway & Power Company and Mr. Wynne served as general claim agent of that company and continued to serve in the same capacity for the Georgia Power Company, the successor organization, doing a large railway business in Atlanta and numerous other smaller communities, also a light, power and gas business in some 200 cities and towns in Georgia.

In 1922 he was similarly honored for his association work by being made a vice-president of the Southeastern Association of Claim Agents, which includes among its members claim agents of steam railroad, electric railway and power companies.



L. F. Wynne

O. H. Bernd

O. H. Bernd

THE man who will head the American Electric Railway Accountants' Association for the year 1928-1929 is O. H. Bernd, practically all of whose business life has been devoted to public utility enterprise. Since 1912 Mr. Bernd has been serving as secretary and general auditor of the Des Moines City Railway and the Des Moines & Central Iowa Railroad. He went to Des Moines from Springfield, Ill., where he had served the Springfield Consolidated Railway, the Springfield Light, Heat & Power Company and the Springfield Gas Company.

Mr. Bernd is a product of Illinois soil. He was born in Peoria and was first employed in 1900 in the freight department of the Chicago, Peoria & St. Louis Railroad, a steam line at Peoria. Three years later he left the steam railroad business to become statistician of the the Peoria Gas & Electric Company, now the Central Illinois Light Company, and was appointed auditor of that company in 1906. Three years later he was transferred to Springfield.

Mr. Bernd has been active in association affairs since 1914. During the years 1926 and 1927 he served as chairman of the committee on freight accounting and at the present time he is a member of the American Association's committee on insurance, being appointed to that committee in 1924.

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T. & T. Covers Many Subjects

Employee relations, traffic problems, speed with safety, service betterment and bus operation came up for discussion at well-attended meetings

"SO OPERATE your car or bus that today's patron will be tomorrow's customer." Taken from a framed motto hanging in the trainmen's quarters of one of the country's largest traction systems, this expression summed up the spirit which pervaded the meetings of the Transportation & Traffic Association. Speed, comfort and safety must be provided, but above all, the spirit back of them all must be service on the part of the operating company, from the general manager down to the trainman on the cars.

No longer is the trainman who, through bad luck or momentary carelessness had an accident, to be summarily "fired." Instead, psychology is to have an important part in deciding the case, with the strong probability that instead of trying to place the blame his superiors will seek to determine the causes back of the unfortunate occurrence. The matter of traffic congestion which, as one speaker expressed it, is not an evil but a problem, also came in for consideration, as did motor bus operation, maintenance and accounting practices. Quite evidently the man in charge of service is not entirely satisfied with the present methods of accounting practice as applied to bus operation, and is going to have something to say as to the basis to be used in the allocation of expenses.

Edward Dana

Opening the sessions of the Transportation & Traffic Association, President Edward Dana called the meeting to order and delivered the annual address Monday afternoon.

In his introductory address President Dana reviewed briefly the progress of the Transportation & Traffic Association since its organization 21 years ago and paid tribute to the wisdom of those who had carried on the work of the association during the ensuing years. He touched upon the high points of the committee reports which were to be presented in abstract, urging his hearers to read and study the complete reports and to see that they were given the widest possible circulation among those who were unable to attend the meetings in person. In summing up the outstanding problems of the industry he dwelt briefly upon the traffic problem, the control of accidents and the necessity of inculcating the principals of salesmanship into those in direct charge of the operation of the cars. He reminded his hearers that the way was prepared and the stage all set for constructive accomplishment, and urged that they go back to their properties with the determination to do things, not merely talk about them.

Following General Secretary J. W. Welsh, who briefly outlined his annual report, Samuel Riddle presented the report of the committee on nominations. The following men were unanimously elected to hold office for the ensuing year:

President, W. H. Boyce, commercial manager Pittsburgh Railways, Pittsburgh, Pa.

First vice-president, Samuel Riddle, vice-president and secretary Louisville Railway, Louisville, Ky.

Second vice-president, P. E. Wilson, vice-president and secretary Cleveland Railway, Cleveland, Ohio.

Third vice-president, George B. Anderson, manager of transportation Los Angeles Railway, Los Angeles, Cal.

Secretary-treasurer, J. W. Welsh, general secretary American Electric Railway Association, New York City.

Executive committee, R. N. Graham, manager of railways Penn-Ohio System, Youngstown, Ohio; F. L. Butler, vice-president in charge of operations Georgia Power Company, Atlanta, Ga.; Richard Meriwether, vice-president in charge of operations Dallas Railway & Terminal Company, Dallas, Tex., and William E. Wood, president of the Virginia Electric & Power Company, Richmond, Va.

The report of the committee on traffic and safety was presented by R. W. Emerson. He was followed by E. J. McIlraith, who spoke briefly covering various outstanding points on the report which had just preceded. It was Mr. McIlraith's view that the characteristics of accidents prove men should be sufficiently well known by their inspectors and supervisors before it becomes necessary to submit their performance to statistical analysis. He urged the necessity of daily and hourly training and inspection, and made it a point that the management must impress the men by its own treatment of matters relating to safety so as to merit their confidence. In his opinion there is a parking problem but no parking evil, and railway managements would best serve their own interests by an endeavor to move all traffic in hopes of thus enlisting the support of automobilists, truckmen and others engaged in "free-wheel movement" over the city streets. Before making too much of a drive on traffic offenders, railways should put their own house in order and see to it that track repairs, overhead repairs and the like, should be performed after business hours. Mr. McIlraith referred to the model municipal traffic ordinance prepared by the Hoover Committee and urged that an effort be made to put the regulations which the new code contain in effect in the cities where they operate.

A paper on "Parking," which was to have been read by F. W. Caley, secretary of the Cleveland Automobile Club, was presented by George B. Anderson.

Mr. Caley, in his paper, reminded his auditors that the day of the hitching post in front of the country store is past; the country store itself has made way

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for the big city emporium, but the traffic problem, like the poor, is always with us. And because it is a problem it has been made the subject of reform waves that have led to many absurd suggestions for relief and much foolish legislation. "But," continued Mr. Caley, "it isn't a question for half-baked self-styled experts and civic reformers. It's a question for men of traffic experience, and preferably for those who are deeply concerned from the viewpoint of their business pocketbooks." Of all interests, perhaps none is so much concerned as the street railway, the importance of which is tremendous, as is quickly made apparent when street car service is tied up for any length of time by storm or strike. Accordingly, the speaker pointed out, the transportation of individuals by common carriers should be given preference, within congested districts, over the movement of vehicles engaged in individual passenger transportation as well as those engaged in the movement of goods.

Alexander Forward

Fred H. Caley

Charles E. Wondries

E. J. McIlraith

While recognizing the undoubted advantage of double-decked streets and the expenditures of great sums of money in the construction of super-highways, Mr. Caley gave it as his opinion that much simpler measures of relief were available, based upon the normal tendencies of city development. These measures he cited as follows:

1. The well-recognized requirements for more and wider streets.
2. Emphasis by the authorities upon the movement of traffic, giving it preference and entire right of way over the motionless vehicle.
3. A definite policy for the elimination and regulation of parking, to be worked out gradually over a period of time.
4. The encouragement of the investment of private capital in commercial parking space.
5. Provision for adequate short-haul as well as long-haul transportation by street car or rapid transit.
6. The establishment of adequate by-pass routes for motor vehicle traffic, so that people who merely want to get from one side of the city to another can do so without passing through congested districts.

Mr. Caley stressed the importance of keeping all legislation within practical limits and avoiding grandiose remedies. Plans for parking relief and traffic regulation should be within pocketbook limits; they should not disrupt the natural habits of the city, they should be definitely related to normal progress and, above all, they should be definitely and carefully thought out and consistently put into effect.

Another paper, by R. F. Kelker, Jr., on "The Effect of Passenger Automobiles on Mass Transportation Traffic," was read by H. O. Allison.

Managing Director Lucius S. Storrs was called to the platform for a few remarks and gave it as his opinion that the industry had passed through the age of wonderment and urged the necessity of co-ordinated research. In the discussion that followed short remarks were made by W. H. Boyce, Colonel W. V. Bingham, personnel director of the National Research Federation, G. B. Anderson, Alonzo R. Williams and others.

The day's program was concluded by the showing of the safety motion pictures which had been prepared under the direction of the advertising section of the American Railway Association.

The report of the committee on service betterment, abstracted elsewhere in this issue, was the subject of discussion at the Wednesday session. President Dana defined the substance of the report as indicating means of improvement without capital expenditure, and cited such elements as increase of speed with safety, adoption of one-man cars in so far as circumstances would permit, and education of the personnel in the principles of salesmanship and service to the public. J. W. Kneckt, general superintendent Grand Rapids Railroad, explained the method employed in Grand Rapids of educating its train force through the agency of monthly meetings which were addressed by officers of the company. He credited much of the success which had been attained to the frankness of the company officials in explaining the financial status to the trainmen. He gave it as his opinion that when the operating force understood the difficulties of the situation they were more than ever inclined to exercise care in avoiding accidents. C. W. Chase, president Gary Railways, Gary, Ind., told of the success that had followed the 100 per cent adoption of one-man cars on his property. He feels that to this, more than any other factor, is due the present financial solvency of the company.

W. W. Holden, manager railway department San Antonio Public Service Corporation, San Antonio, Tex. spoke in favor of the telephone dispatching system adopted in that city, which has given both a reduction in expenses and a decided improvement in service. He urged it upon the association to get back of an intensive research program in order to develop further some of the ideas set forth in the committee report.

W. H. Burke, southwestern manager Stone & Webster, Houston, Tex., took the membership to task for failing to take action on the very excellent recommendations which had been made by the committees of the association in the past. Taking up the report of the present committee on service betterment he pointed out several of its salient features as worthy of special commendation and urged those present to take some of the suggestions home with them and put them into effect. Mr. Milener, research engineer of the American Gas Association, complimented the committee for the thoroughness of the report and proceeded to read the paper which had been prepared by Alexander Forward, managing director American Gas Association, in which he reviewed the accomplishments of the industry which he represents

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in changing over within a few years from a 90 per cent lighting load to a 92 per cent heating load and at the same time increasing its sales nearly 400 per cent. He stressed the importance which research and study had played in bringing this about.

"In this age of science," stated the speaker, "it is true in all other great industries as in the public utility field that the correct measurement and appraisal of the exact facts of the past and present afford the truest index of the future. Those who realize the vital necessity for measurement are equipped for present-day needs; the others are not. Recognition of this fact is one of the outstanding developments of our time." He cited a statement that came out at the last Imperial Conference of Statesmen of the British Empire to the effect that scientific research is no longer a luxury, but a necessity, and proceeded to show how this tied in with the present status of the electric railway industry. He also called attention to the extent to which the gas industry was co-operating with various governmental departments at Washington in determining facts essential to its future.

Mr. Bowman, district commercial manager for the Ohio Bell Telephone Company, detailed the methods used by his company to determine the future growth and development of communities, illustrating his talk by lantern slides.

A playlet, "Rules Is Rules," produced by talent from the operating personnel of the Public Service Co-ordinated Transport, Newark, N. J., displayed real dramatic ability and made a big hit with the audience.

Bus operation, maintenance and more particularly, bus accounting, was the principal order of business at the Thursday afternoon session. The report of the committee on bus operation, abstracted elsewhere in this issue, was the basis of a discussion which was participated in by a number of the delegates. That bus-hours rather than bus-miles should constitute the basis of accounting seemed to be the consensus of opinion, although it was apparent from the report of the committee that few member companies are using this method.

F. C. Kells, West Penn Railways, approved the principle of segregation as set forth in the report and quoted from his own experience in support of its advantages. It was his opinion that men in direct charge of bus operation as well as the accountants should have something to say regarding the allocation of costs. C. W. Stocks, editor of *Bus Transportation,* went even further in suggesting that each route, each type of service, each make of vehicle, should be the subject of a separate cost study, and expressed the opinion that the extra cost would be more than justified by the results. Morris W. Rew, research department, Cleveland Railway, approved the suggestion of the committee as to the establishment of the bus hour as the correct basis of cost study and suggested that date of purchase be also made an item of consideration.

D. L. Fennell, superintendent of transportation Kansas City Public Service Company, deplored the lack of detailed information, particularly on experimental work, and suggested that the committee for next year make a further inquiry among member companies into their practice as to the establishment of bus lines into new territory. Drawing upon his own experience, he expressed the opinion that people are willing to pay higher fares for bus than for similar trolley car service. Alexander Shapiro, assistant general manager Washington Rapid Transit Company, suggested further investigation into the best methods of employing men for bus service.

Others who spoke were R. F. Meade, Peoples Motor Bus Company of St. Louis, and L. H. Palmer, vice-president Fifth Avenue Coach Company, New York City.

Speaking on the subject "Relations between Manufacturer and Purchaser after the Purchase," Charles H. Wondries, manager of the commercial division, Studebaker Corporation of America, explained the methods pursued by his company in keeping in touch with its customers after a sale had been made. A corps of trained field men is maintained, working directly under the service and engineering departments, to examine into the operations of all purchasers, consult with them as to their needs and advise them in the event of trouble. The reports made by these men are carefully tabulated and circulated among all interested parties in the organization with the view of getting at the root of all trouble that develops and avoiding a recurrence.

"In our dealings with our customers," says Mr. Wondries, "we at all times endeavor to maintain the following relations: Frequent factory contact with the operator so that we will know his problems and co-operate with him in solving them; prompt attention to service complaints; assistance in providing a proper accounting set-up; free architectural service in the planning and building of service stations, garages and bus terminals; a friendly welcome to suggestions from operators, and the services of an up-to-date service school which is maintained at the factory. Every effort is made to convince the purchaser of our equipment that his problems and ours are the same, and that it is to our mutual advantage to see that they are satisfactorily worked out."

Company Publication Editors Meet

PROBLEMS connected with the publication of house organs and methods of co-operation between the association magazine, *Aera,* and the various company publications were discussed at an informal luncheon meeting held on Thursday at the Hotel Hollenden. In the absence of J. H. Hanna, chairman of the committee on publications, John A. Miller, Jr., editor of *Aera,* acted as sponsor. It was the feeling of the company publication editors present at this meeting that some sort of organization should be set up whereby they would have better opportunities to discuss their problems during the annual convention of the American Electric Railway Association and whereby they might also co-operate more effectively with each other throughout the year. Among those present were E. D. Hale, Louisville Railway; Robert Dougan, Capital Traction Company; R. W. Garvin, Monongahela West Penn Public Service Company; R. R. Retan, Grand Rapids Railroad; E. E. Slick, Union Traction Company of Indiana; Frank Wert, Pennsylvania-Ohio Electric Company; C. Thorburn, Pacific Electric Railway; E. B. Atchley, Northern Ohio Power & Light Company; E. B. Sanders, Kansas City Public Service Company; J. F. Wooley, Jr., Utah Light & Traction Company, and H. H. Norris, Boston Elevated Railway.

Proceedings of the Accountants and Claims Associations will be reported in a subsequent issue.

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Adequate Fare Needed to Create Ample Credit for Transportation Companies*

By Owen D. Young

Chairman of the Board General Electric Company

DETERMINATION and allocation of the agencies of transport, in a way, is the simplest and the easiest part of the huge problem facing the electric railway industry. Much more must be done. If new and adequate facilities of transportation are to be provided, money must be found to pay for them. By and large, I believe that our means of local transportation are more inadequate and unsatisfactory than any other part of our modern machine. That means that the facilities should be in substantial part rebuilt, and that they should be vastly improved and extended. That requires large sums of money. Now there are only two ways of securing capital for such an enterprise. One is to create a situation where private capital will voluntarily invest. The other is to take the capital away from the individual involuntarily through taxation and provide facilities by public ownership. It is vastly more important to the public to get the job done than to debate forever how, as between these two systems, it ought to be done.

Private Capital Should Provide Funds

Let no one misunderstand that statement, whether it be applied to railways or to other public utilities. I believe it to be in the interest of the community that such facilities should all be provided by private capital. It is not because the government could not build, manage and operate these systems. The government can. It is because there can be no economic check on the enterprise unless it has to go into the market for its capital. Unless there is an economic check on the enterprise there is no real way of measuring the value of its service.

There are those who believe that in this country we can substitute the political check for the economic one. I do not. Whenever public facilities are to be provided, it is the safest for the community as a whole that the cost should be commensurate with the need, and the best way to determine that is see whether people will pay enough for the service to attract the capital to that enterprise. Then you have a constantly working referendum. If, however, you delegate that question to a few politicians, they will be acting upon the political expediency of the moment, and they have the power to take the capital out of the individual pocket involuntarily.

Therefore, I say that insofar as the community can secure the public service needed through private ownership and private capital, it is wiser and more economical in the long run for the community to do it so. Even if the private capital gets 1 or 2 per cent more than it should, it will still be more economical for the community as a whole. It will be the part of wisdom to resolve the doubt on the side of good credit as an insurance of ample capital supply, even in the worst of times, and therefore of service at all times.

Owen D. Young

I want to make sure that you understand me. I am not opposed to government ownership because the government cannot do the job. I am opposed to it wholly because there is nothing but a political check on expenditure. And I think we have learned pretty well in this country, at least, that a political check on an economic situation is inadequate to protect the community. The only kind of check on an economic situation is an economic check. If the public desires to go into the business of the ownership and management of utilities, I think it should be precluded from drawing upon the state treasury or the public treasury and thereby drawing on your pockets involuntarily through the power of taxation to support those enterprises. If the state or municipality wants to go into the business of running public utilities, let it go into the market for capital on the basis of the credit of the utility itself. Then we will know by the

**Abstract of an address delivered at the annual convention of the American Electric Railway Association, Cleveland, Ohio, Sept. 22-28, 1928.*

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reaction of the market whether or not the municipality or the state can do it better than the private owners. If it can go into the market and get cheaper capital, if its accounting is better and shows better results, then we must all retire in favor of the state, because we cannot maintain ourselves in a position of doing an uneconomic and unsatisfactory job. But if, conversely, our balance sheets are better, then I think equally we ought to ask public ownership to retire from the states.

Now I must hasten to say, too, lest I be misunderstood, that there are some public services which have such large social significance that they cannot be translated into economic terms, and therefore private capital cannot be called upon to meet such needs. In such cases I shall always be in favor of taking the capital involuntarily from the taxpayer, because in a country as rich as this we must keep our social machinery in line with our economic resources.

I think our facilities for local transportation should be paid for by private capital, at least until it is demonstrated that our social needs for distribution of the population are so great that we cannot get the results through our usual financial machinery. By and large, I think in this country we are still able to get private capital to do the job, but that means co-operation on the part of the public authorities, with those who understand the business of transportation, to create a situation in which the credit of local transportation companies can be established and maintained, in order that private capital may be acquired.

What are the elements necessary to establish such credit? First, the rate of fare must be such as to provide a gross income adequate, after operating expenses, including maintenance and reserves, to yield a fair return on the capital required for the facilities. Second, that situation must be insured by satisfactory franchises for such a period as will warrant permanent investment. Third, in my judgment, a monopoly should be established of local transportation facilities of all kinds, and the rates and service should be regulated by the government so as to give to the public the best service and lowest rates, consistent only with such return as will always enable them to get the capital desired for their needs. Unless we have a monopoly and public regulation, we must do the job by competition, and I believe that in this field of transportation competition is not an effective regulator; it is merely a destructive one which can come to nothing else but government ownership in the end.

So I say let us provide ample credit for our transportation companies. Let us give them sound fares. Let us demand from them adequate facilities. Let us build up a situation where we get sufficient capital to meet all of our transportation needs, and let us do it quickly in order that the horrible congestion which now exists in some of our great cities, which is not only uneconomic but immoral, shall be abolished from this country, which at least is rich enough to provide, one way or another, decent transportation facilities for its people.

All of the financial water has been drained off the railways as a result of the experience of the last few years. Some part of the substance has gone, too, but the values which now remain are, in my judgment, reduced to the lowest terms and should furnish a sound basis for new capitalization and new capital, provided satisfactory conditions for the future are granted by the public. In a word, I am not pessimistic about the street railway values which are left. It is now time to build on them the new structure which the public needs and which the initiative of you men skilled in the business must provide.

If we can determine what agencies are the best for the job and if we can determine how we will pay for them, whether by public or private capital—and if by private capital, at the lowest rate obtainable—then we shall be on our way toward a real solution of this vexing question which at present is a disgrace to the intelligence of the American people. May I mention some of the slogans which bar the way? First and most persuasive of all, the 5-cent fare for all distances and under all conditions. The 5-cent fare is the disease of our coinage and our fluctuating price level. It is the attractive germ by which politicians inoculate the public with an apparently incurable and progressive ailment.

Let us look for a moment at the justice of this fare question. The average increase in the general price level of this country between 1913 and 1928 is approximately 60 per cent. In other words, it takes at least $1.60 to buy goods today which could have been bought in 1913 for $1. If this same percentage of increase were applied to street railway fares it would mean that an 8-cent fare is now, measured by commodity prices, only the equivalent of a 5-cent fare before the war. This is, as a matter of fact, the general average now attained, but unfortunately this does not answer the whole question. Everyone knows that the law lags behind economic change. Increase in costs and competition from the motor industry did not wait upon the deliberations of public service commissions; increase in the fare necessarily did. The result speaks for itself. I need only say that, as a consequence, there is an enormous slack to be taken up, and the inevitable losses of the past few years, not so much to stockholders through the suspension of dividends as to the service through depletion of funds for maintenance and reserve, make adequate rates today all the more imperative if the service is really to be restored.

Even this is not the whole story. For example, the level of wages in this country has increased during this same period on an average, not of 60 per cent, but of 120 per cent, and it is a fact that the price of labor is a much more important item in transportation costs than the price of commodities. If we were to apply that percentage of increase to the 5-cent fare, we would find that 11 cents now is no more than the equivalent of 5 cents in the earlier days. So it may not be far out of the way to say that somewhere from 8 cents to 11 cents is the equivalent of the old 5-cent fare. This only assumes, of course, that the service of today shall be no better than the old service, but we all know that improvement is demanded, and rightly demanded, everywhere. High-speed service, overhead service, underground service, more reliable service, is the rightful expectation and demand of the public. Improvements can be made and will be made, but it is neither wise nor just for the public to make demands and then set up obstacles to performance. And now I say that, in my judgment, it is just as bad for the railway managers to make promises to the public which they cannot perform. They make it under the coercion of the situation. My advice to the railway managers of the country is, to stand on the fair valuation of your property, ask for a fair return, render such service as economic conditions will permit you to render, but do not compromise with the inevitable by promising to do something that can't be done.

Certainly the farmer in 1928 does not expect to feed

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his horses half the oats he did in 1913 and yet get the same service from them. That is exactly, however, what the public is demanding where it still insists on the 5-cent fare. If a 5-cent fare is insisted upon where on the average it costs 8 cents to transport, why talk about private capital doing that job? It simply cannot be done. Nor can it be done any cheaper by public capital, but we can tax the community instead of the individual rider to make up the difference. To all advocates of a 5-cent fare when it costs 8 cents to transport I say, not in the interests of the street railway industry but in the interest of the public, be fair with your slogan. Do not expect private capital to do the job under those circumstances. Frankly say that you are for government ownership and that you intend to tax all people to give riders carriage for 3 cents less than cost. Let us cut out the nonsense and get down to business. The fare, however, cannot be such as to defeat the very distribution which is necessary to the social needs of the community, and when it does we shall have to take the social penalty or go to government subsidy or ownership.

I shall be bold enough to speak of one more condition affecting the electric railways of the country which has tended to create some confusion in the public mind, and has perhaps to some extent delayed both the public and the industry in meeting the basic issues involved in adequate street railway service. I refer to the practice of unifying, either in fact or in treatment, the investment in the local railway service with that of the light and power service. In such a case, if the light and power rates provide a satisfactory return on the total investment, there is no great pressure on the part of the owners to force the issue with the public of a sound economic rate of fare on the railways. By and large, it is conducive to the comfort of the local utility management and to the comfort of public authorities to permit the continuance of a low rate of fare on the railways which will be locally popular, and continue the light and power rates on a higher level in order that they may supplement the return on the railway investment.

Now, I do not mean that this situation results from bad faith on the part of anyone. In many situations in this country the railways and the electric power and light properties have been combined for many years. The naturalness of the combination is self-evident. The consolidation of these properties very largely took place prior to the time of large unification of power properties. Consequently, during the last fifteen years it has frequently been impossible for the power companies to acquire important units of local distribution in their systems without buying at the same time the local street railway property. Having acquired it, they naturally and very appropriately wanted a fair return on the invested capital.

The point which I wish to make is that they were not greatly concerned whether each property stood on its own economic bottom. Being human, they were willing to acquiesce in an uneconomic railway situation if the valley of the railway net could be made up by an adequate peak in the light and power earnings. For many communities I am not saying that this was a bad method, certainly not as a matter of expediency. The harm came to the industry when the fares on such unified properties were compared with the railway fares in some other community where the transportation property was not unified with the power and light service.

There is no more persuasive argument against an increase in fare than to point out that another community, perhaps of about the same general size and having similar operating conditions, is paying less for its transportation than either the present or a proposed new rate. So there are today throughout the United States certain railway situations where uneconomic fares are being charged without protest by the owners, and, of course, with the full approval of the public authorities. These situations naturally tend to delay the complete rehabilitation of the railway industry as a whole, and are therefore regrettable.

By and large, I believe it will be better for the industry and for the public to face frankly the question of providing an adequate return on its transport capital either from fares or through a frank subsidy from the public treasury. To levy a special tax on power and light users to supplement an inadequate railway fare is, in my judgment, unsound in principle, and will in the long run delay the best development of both industries. If that be true, then each community should provide for each service such rates as will yield a fair return on the investment in that particular service. It would be highly unfair in cases where they have acquiesced in unification to reduce the power and light rates without providing at the same time an adequate return on the railway investment. Perhaps that is too much to expect of politics, but, I, for one, shall never lose faith in the soundness of judgment nor the fairness of spirit of the American people if problems are put to them frankly and clearly. Secrecy and confusion are the enemies of confidence. Confidence is the basis of business. It is the sound insurance of fair treatment extended to men and money that render a public service.

The public must know that while it can exhaust the capital now sunk in the industry by unfair treatment it cannot by such means induce new capital to go in. That, unfortunately, is our situation in many places today. This must be corrected, and I have confidence that the masses of the people, even over the heads of their political leaders, will insist on its correction if the matter be properly represented.

If I may summarize the things which I believe in, they are:

First, That the business of local transportation should be a monopoly, publicly regulated as to rates and service, with a fare adequate to attract private capital if such fare can be obtained, and if not, then the distribution needs of the community should be satisfied through the tax levy, either under public ownership or as a contribution to the deficit in private ownership.

Second, That private ownership be adopted in all cases where it can meet the needs of the community, and when adopted that the conditions be made such that the safety of the capital be adequately insured and the rate of return be as amply provided for as in any general business in order that the cost of the capital may not be greater for these enterprises than for others.

Third, That the transportation company, whether it be publicly or privately owned, use the means best adapted for the most efficient and economical transportation of the public which it serves. I hold no brief for electricity, except that if it cannot be used in local transportation it will have met its first great defeat. If it can be used advantageously, then our research and engineering, under the impetus of a new spirit and in the light of a pressing need, should be drafted into service to redeem an industry and an art which has been able to survive during these last fifteen years only by reason of the courage and determination of the men who have administered it.

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Our Faith Has Been Justified*

Encouraging progress made during past year. Public opinion has become more favorable. As we improve our service we can feel confident of winning the rewards to which it is entitled

By R. P. Stevens

President American Electric Railway Association

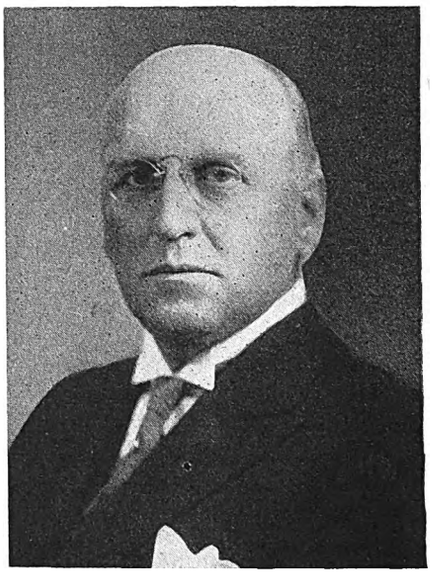
MUCH to encourage, much to inspire, will be found by all of us in the progress made by our industry and our association during the past year. Our industry is moving definitely forward toward overcoming the many difficulties with which it has been beset for more than a decade. Many of the obstacles that once seemed almost insurmountable are gradually giving away before the determination and spirit with which transportation men are attacking them. Under the banner of public service, we have carried on when the outlook seemed dark indeed. For a time, the very public we serve seemed against us. But we were convinced that public transportation is a necessity in our modern civilization, and we struggled to find the solution to our problems despite great and prolonged discouragement.

Our faith has been justified. Slowly, but surely, one difficulty after another is being overcome. Our rate of progress during the past few years has been more rapid than seems apparent to us when we are engrossed in the many complexities of daily operation. When we glance back over the road we have traveled during the past few years; when we review mentally the difficulties that have been met and largely overcome, we begin to grasp the full significance of the truly remarkable progress that has been made.

The program of this year's convention tells its own story: Modernization! Improved service! Merchandising! These subjects are in sharp contrast with any intimation that the public transportation industry has outlived its usefulness.

Nothing has happened in the past year to change our firm conviction that the electric railway industry is a permanent, basic industry. Nothing yet has been devised that can take the place of the electric car in handling expeditiously and economically the local transportation of the masses in our large and medium-size communities. Nothing is apparent in the immediate future that will affect seriously the permanent value of our industry to the communities which it serves.

The public itself is slowly, but nevertheless surely, coming to realize the essential nature of the service which we render. It is coming to understand better than formerly something of the economics of public transportation. It has learned—sometimes after costly experiment—that there is a great difference between a responsible, community-wide transportation service, and "wildcat," spasmodic operations by individuals or irresponsible organizations that are unwilling to take the lean traffic along with the fat. It has learned that competition of that kind with a responsible and established



R. P. Stevens

carrier is actually a parasite on the community and that such operations are unwilling to carry the full responsibility for maintaining the kind of a community-wide service which is the first requirement of a public utility. Unfortunately, the public in some cities failed to understand these principles until irreparable harm had been done. After permitting "wildcat" operations of jitneys or irresponsible buses to starve their transportation systems out of existence, these communities learned all too late that their neglect to curb irresponsible competition in transportation had cost them a basic and necessary utility service.

But fortunately instances of this kind are now limited only to a few misguided communities, where public officials have failed to recognize their full responsibilities to the public which they represent. The same is true with respect to other basic conditions which have handicapped our industry in the past. There is a definite trend in progressive cities to revise the former rigid and inflexible franchises, in favor of service-at-cost and indeterminate grants which permit adjustment to meet changing conditions. There has been a steady increase in the rate of fare to meet the higher cost of giving service. The average cash fare for the country is now 8.17 cents and the fixed 5-cent fare has almost disappeared along with the 5-cent cigar, except in a very few communities where public officials refuse to recognize that the public suffers most when transportation is starved to the point where first-class service becomes impossible.

Except for comparatively few instances where these necessary basic changes are still in the process of being worked out—and they will be worked out if public transportation in those communities is to continue—there remains only one major question regarding the future of our industry. The private automobile has become so common a means of personal transportation that many

Abstract of presidential address at the annual convention of the American Electric Railway Association, Cleveland, Ohio, Sept. 22-28, 1928.

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who formerly used our service, now ride in their own vehicles for daily travel. Consequently public transportation agencies, for a number of years, suffered a sharp falling off in riding.

This has been felt most in the smaller communities. In the larger cities, limitations in street capacity are causing a very definite reaction. Traffic congestion has become one of the most serious problems with which these cities have to contend, and many of them have come to realize the importance of the part played by mass transportation agencies. Manifestly it is economically impossible to provide sufficient street space for all to travel in individual vehicles, and the cost of individual transportation is beyond the reach of great masses of our population. This situation is reflected in the traffic figures of local transportation companies. The average for more than 100 companies reporting for the seven months ending July 31, 1928, as compared to the corresponding seven months of 1927, shows a decrease of less than 1 per cent. Of these companies, many show considerable increases for several years.

But that is not all. The industry is completely changing its own conception of the nature of its business and of the measures needed to meet the desire for comfort and luxury brought by the automobile. The program of this year's convention, and the cars and buses being displayed in the exhibit, tell the story more convincingly than I can put it into words. We have struggled with the problem of the automobile for a number of years, but we are finally about to meet it upon its own ground. We are in the process of developing equipment with which to meet the competition of the individual vehicle.

A few years ago the bus was considered a threat against the established transportation agencies. But that is no longer true, for we have ceased to remain merely electric railways, in that practically all the companies belonging to the association are operating buses in conjunction with their rail service. Growing experience with the bus has gradually indicated its proper economic place. It is becoming clearer each day that, while the bus offers a valuable adjunct to rail lines for certain classes of service and under certain operating conditions, it has its limitations as well as its advantages. Its field is not in the replacement of rail service in heavy traffic territory, but in furnishing service in sections where rails cannot be supported; in providing crosstown and feeder lines, and in distinctive classes of service at different rates than those charged for mass transportation. Even the taxicab is being taken into the fold by some companies where conditions make this possible, and the progress toward unification and co-ordination of public transportation facilities has been definite and rapid.

There no longer exists a serious question regarding the replacement of electric railways with buses. Where that question does exist today, it is within the industry, and involves merely the substitution of one vehicle for another on specific lines where the economic conditions dictate this move in the public interest.

It is significant that the extension of new rail lines and the additional service provided by local transportation companies with buses, far exceeds in mileage the total of all suspensions or abandonments of individual pieces of trackage due to shifting population or other local economic changes. This pruning and adjustment is a healthy process. It results from the examination of individual lines and routes with a view to eliminating wasteful operations that hold back the progress of an entire transportation property. But it is notable that the few abandonments of entire rail properties that have occurred are limited to only very small communities where it is questionable whether they will support any form of public transportation—either by street car or bus.

The spirit of salesmanship is rapidly permeating our entire industry. If there ever was a public-be-damned attitude on the part of management it certainly does not exist today. Every progressive operator is thinking in terms of improving service, developing a more cordial attitude on the part of employees toward passengers and the public, and application of modern merchandising methods to increase the use of public transportation.

The interurbans, which as a class have been among those hardest hit by automobile competition, are working in this same direction and, in addition, are turning their attention more seriously to the development of freight business. There has been some inertia in the improvement of facilities for handling freight and in the degree of co-operation between various companies that is essential for developing a satisfactory volume of interchange freight business, but definite progress is being made and the future for most of these properties looks brighter than it has for a number of years. Some of them have already gone ahead to a point where remarkable increases in traffic have resulted. These properties are pointing the way for those that have held back.

When we stop to view the future for our industry in the light of our experience during the past few years, there is ground for real enthusiasm. At the rate of progress which the industry has been making in changing its viewpoint and its conception of the measures needed to meet the changed conditions under which the public transportation business must be conducted, we may look forward to a truly remarkable improvement during the next five years. We are concentrating on the development of equipment which will attract riders; equipment that will be in keeping with its surroundings in the modern city; that will look better, ride better, accelerate faster, operate more quietly and more economically than the equipment which we were accustomed to look upon as satisfactory. We have made considerable progress in the modernization of our facilities and our thinking, but we have by no means exhausted the possibilities. We are in the midst of great fundamental changes within the industry. Until we complete the process, management has not discharged its full responsibility, and the public will not have had the opportunity to judge in proper perspective the part which public transportaion plays and may be expected to continue to play in the economic and social life and development of the nation.

We are now at the beginning of another association year. I believe it will be more prosperous than any year of the recent past. Surely an industry that can weather such storms as we have weathered during the last ten years, has proved its staunchness and stability—its right to live and serve. Not only that, but it has proved that there is a basic need for the service which it renders. With the industry now aroused to a better understanding than ever of the change in public expectations; with a change in its point of view and rapid progress toward the improvement of its facilities and service under way; with public good will manifestly becoming more favorable; and with a growing determination by every executive, operating official and, yes, every employee, to strive toward the ideal of the highest possible efficiency and courtesy in its service, we look forward with rising expectations, confident of winning the rewards to which such service is entitled.

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Success Will Reward

Continued Improvement of Transportation*

By B. C. Cobb
Chairman of the Advisory Council American Electric Railway Association

ANOTHER year has run its course—another lap in the space of time has been put behind us—and we of the electric railway industry are once more, and for the third successive year, gathered together in Cleveland for conference and communion. In our effort during the past year to so conduct ourselves as to merit commendation from the citizens of this great country of ours, I am sure we have been measurably successful—successful not only in our comportment but also successful in telling our story to the people. We have told this story in many ways; viz., by advertising in the press, by addresses delivered to the public and to the industry itself, by remarkable exhibits at our conventions of our transportation vehicles, and last but not least, by an honest effort to render at all times a courteous and convenient service.

The exhibits of transportation vehicles at the last few conventions have been really extraordinary. They have been not only educational to the industry but also to the public, and they surely have borne witness that the manufacturers and the industry itself are striving in every way possible to improve the service and make comfortable, convenient and safe the carriers in which the people ride.

We who are charged with the carrying on of the transportation business in which we are interested still feel, as we have always felt, that our service is an essential and a necessary thing. We are not unmindful of the convenience, the luxury, and I may say extravagance which have been provided and caused by the privately owned automobile. We recognize these things and do not resent or criticize them except in so far as they are detrimental to the public good. To injure or hurt the automobile industry in any way would be a calamity, for the automobile business has become if not the greatest, then nearly the greatest, industry in our midst. The use of automobiles has become a necessary thing in our daily life, and we who originally and for many years carried passengers only by electric tram have learned that the auto bus is of distinct advantage in our transportation service.

Neither we nor the public should, however, forget that the constantly increased use of privately owned automobiles has had a very marked effect upon passenger travel in public transportation vehicles. To say that the privately owned automobile has always been wisely used would be to speak untruthfully. To curb its use by drastic laws and unwise regulations would be harmful. There must be some middle ground, however—some safe and sane method of control—covering the use of this form of vehicle which will be helpful to all concerned. Sooner or later—and I am not going to dwell upon this subject, for it has been discussed quite fully in former reports—the parking nuisance is going to be abated, not because it will benefit the transportation companies but because the people themselves are gradually recognizing the evil that it does in many other ways.

We think it is generally conceded that all communities of any size need public transportation service of some kind—either electric rail, auto bus, taxicab, or something similar. We of the industry, however, are still firmly convinced that mass travel in urban centers can be handled to better advantage and greater efficiency on fixed rails and by electric cars than in any other way.

The past year has not shown any appreciable increase in the number of passengers carried. Sixteen billion is the approximate figure, and this figure has remained almost stationary for several years. The wonder of it all is that there has not been a decrease resulting from the constantly increasing use of the privately owned automobile. Last year the American people owned and operated 20,500,000 passenger automobiles, or one automobile to every 5.5 inhabitants of the country. Just what the record will be at the end of 1928 I do not know. Most likely it will be about 23,000,000 units. When we consider this development, which is largely competitive, I ask you, is it not unjust to say that our industry lacks courage and has not had foresight or been brave in its efforts to stem the tide which set in against it once the automobile became a generally accepted mode of travel? What this industry needs today is not criticism but constructive suggestion and help from the communities in which it operates. Except in a very few instances, the industry has received just this sort of thing—I mean help from the citizens and authorities in getting over many of the rough spots in the road.

Higher Fares Necessary

The greatest help that authorities and the communities have given is their willingness to increase the rates of fare that may be charged for passenger travel. The average city fare today is approximately 8 cents. While such rate of charge may be sufficient in some of the larger cities, my own opinion is that, if the companies are generally to become prosperous—and this I am sure is what everyone wants—a 10-cent fare will have to be the standard. If we are to continue the standard of living adopted in this country since the close of the late

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war—I think no one wants it otherwise—why is it unfair, why is it uneconomic, to accord the railway companies of the country the same treatment that has been accorded all other industries and all other people—I mean the right to charge a higher rate than formerly was charged for the service rendered? Generally speaking, rates of charge for public utility service for several years have been gradually decreasing. These decreases are largely, however, confined to the gas and electric industries, where considerable improvement has been made in the art of generation, which to some extent has lowered the cost of production. In addition, these industries have not been adversely affected by serious competition such as the automobile. This one thing alone has so held down increases in the number of passengers carried—which means curtailment in gross earnings—as to practically wipe out, or at least minimize, savings, economies and improvements in the service rendered.

The public utility industry has many times been jumped on good and hard. Maybe some of us have sometimes deserved such jumpings. Mostly has this criticism and attack come from self-seeking politicians with little to lose but much to gain. The people generally, however, when once they understood the situation, have been fair in their treatment and ready with their help. We have been told many times to tell our story, and this we have endeavored to do. We think this story has been well received. We have often been told that we were poor salesmen. Perhaps this charge or comment has been in many instances true. Nevertheless, I do not think at the moment that such criticism can be substantiated, and I am quite sure that all fair-minded people will recognize the efforts that have been made by our industry to improve its service and sell it to the public.

The electric railway industry during the past ten years has taken many bumps. It has been down in the valley of shadows and darkness. Its era of prosperity was in a few short years changed into an era of dire straits. It has gone through this last era sometimes wavering but generally manfully and bravely, so it is not an overstatement to say that progress from the period of adversity is gradually being made. This does not mean that we have reached the crest or that the era of prosperity has again returned. Such is not the case and we would be unfair to ourselves and likewise unfair to the public which we serve if we made such a statement. We still need help. We still need higher fares. We still need denser travel if we are to prosper.

During the past year some companies have gone into receivership. Happily, however, enough others have come out so as to make the score about even. In this connection, those companies that have been most greatly troubled in this way are the interurbans, where competition from unregulated carriers continues to be severe. This sort of competition is manifestly unfair, not only to the regulated carriers but to the people themselves, who must pay the capital cost of constructing roadways as well as the cost of repairing damages done by commercially operated vehicles.

During the past year the industry lost—and at a young age—one of its outstanding and most competent men. When Robert I. Todd passed into the great beyond only a few weeks since, he left an aching void in the hearts of many who loved and respected him.

The principles enunciated by your council two years since are just as fundamental today as they were then. I will not repeat them, as they must be familiar to you all. Your council, as stated last year, still stands for and believes in those principles.

Finally, the greatest need of the industry is increased travel. This we are hopeful for and it is something which I personally think we shall shortly see. With increased travel, a reasonable rate of fare, and with a better understanding—which surely is the situation now existing between the companies serving and the people—there can be only one answer—SUCCESS—and this means much to everyone.

How Can Modernization Be Justified From Its Financial Results?*

By Alonzo R. Williams
First Vice-President and General Manager United Electric Railways, Providence, R. I.

Alonzo R. Williams

CAN anyone conceive of a business man other than a street railway man who has lived the street railway life for years asking the question, "How can modernization be justified?" At the very outset the question assumes the truth of the present situation, namely, that the street railway companies of the country with but few exceptions are antiquated and behind the times both as to methods of operation and conditions of equipment. This condition of mental and physical stagnation has done as much as anything else to bring about

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the condition in which the street railway industry finds itself today. Can we justify our action in being up to date? It is absurdity itself to ask such a question. Of course modernization is justified. Modernization as I define the word is being up to date, keeping pace with the times, being just one jump ahead of our competitors, sensing the public pulse and catering to it. If the street railways of today keep pace with the times, if the street railways of today are just one jump ahead of the other fellow and if the street railways of today truly sense the public pulse, modernization must of necessity bring financial results. It cannot fail. Population is increasing. The people seek and must have transportation. Do financial results justify modernization? No one will deny that the automobile industry today is financially stable because it is modernized transportation. It is going forward with leaps and bounds. Can anyone deny the stability of the great electric power industry of today? No. Why? Because it is a modernized development of natural resources. In every case where industry has failed to modernize it has faced financial ruin.

From what I have been able to gather from various publications, some street railway companies in this country have already modernized their methods and their equipment and the financial results have justified the expenditures made. In the case of the United Electric Railways of Providence, R. I., the process of modernization is going on and its effect is already being reflected in the financial statements. If financial results justify modernization will such results attract new capital? Capital is always ready to invest in a business ably managed along modern lines and any business so managed must of necessity furnish a financial statement attractive to the financier. Modernization is a recognized necessity. Improvement in the financial results must follow and capital will respond.

The modernized and up-to-date street railway executive has before him a superhuman task in overcoming the antagonism of his heritage. But a truly modern executive can overcome that plague. He can come out victorious only by a sublime faith in the public, in his company, in his men and in himself, and spurred on by that faith, press forward with unbounded enthusiasm.

A modern executive must pull down those battlements and those walls which separate his predecessor from his men and from the public at large. He must fling his doors wide open and must remove those who bar the entrance to those who would consult with him. The boys in blue upon the cars and upon the motor transport lines have at their disposal a wealth of valuable information gained through years of experience on the lines. He should consult with them in his private office. He should help them by personally listening to their suggestions. He should work with them, work for them, encourage them, compliment them for deeds well done and do it, not through a selected agent, but do it himself. The boys in blue are the salesmen in the field and no salesman can enthusiastically sell his wares unless he has faith in his calling and faith in his management. Isolation and secrecy breed contempt. When these men upon the lines have that faith, when they have that understanding, when they feel the power of that leadership, when they feel that they are truly a responsible part of the great whole, then will they go out into the highways and byways and sell the goods the street railway has to offer to a willing and appreciative purchaser.

The public today knows what it most desires and is almost unlimited in its power and ability to satisfy those desires. The advent of the automobile has brought to the door of the citizen today two things, speed and comfort. The people can have both, and will have both, and their patronage will go to him who furnishes both. This is modernization and this is the result of modernization. You can fool all of the people some of the time and some of the people all of the time but you can't fool a car rider today and get away with it. You can tell a man on the street to go to the devil but you can't say that to a trolley patron today for there are too many places for him to go instead, and if he does take your advice and goes to the place where his Satanic majesty hangs out you will find it will be at the door of your competitor. The public of today has drunk deeply of the refreshing stimulant of prosperity. It has inhaled the delightful perfume of luxury. The modern street railway man must needs study this psychology, interpret it correctly and be able to meet its requirements. It is one of the big problems of modern times and only a modernized executive can cope with the situation.

Modernization is the antithesis of the practices of the past. Modernization is nothing more or less than this: Quick, comfortable and frequent service rendered by contented, courteous, helpful employees to an understanding, satisfied and appreciative public. That it pays goes without saying. It has paid in Rhode Island. From a study of the curves of passenger earnings from January to June of 1927 and 1928, it is found that in January of this year the decrease in gross amounted to $71,871, whereas in June the curves had so approximated as to show a difference of but $24,203. The curve for 1928 was flattening out and in a state where the industrial situation is none too good and the weather peculiar to this year has kept people within doors. Under such a showing capital is ready to help. It is unnecessary to talk of modernization, it needs no discussion. Less talk and more modernized action should be the watchword of the future.

"WITH the industry now aroused to a better understanding than ever of the change in public expectations, with a change in its point of view and rapid progress toward the improvement of its facilities and service under way, with public good will manifestly becoming more favorable . . . we look forward with rising expectations, confident of winning the rewards to which such service is entitled."

—*From Presidential address of* RAY P. STEVENS

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How the Association Helps the Industry*

It acts as spokesman for the electric railways in national affairs. It gathers statistics on all phases of operation and answers thousands of inquiries every year. The co-operative effort of the members is of inestimable benefit to all

By W. H. Sawyer

Past-President American Electric Railway Association
President Stevens & Wood, Inc.
New York City

EVERY electric railway operating or manufacturing company needs all the available cash, brains and energy which it can obtain. Few have any surplus to divide. They must conserve to the extreme. Why, then, have an electric railway association which admittedly takes money, time and energy? Why not devote all our resources directly to solving of our local problems? Why be concerned with national activities and the industry at large? Why worry about the other man's troubles, as it were?

We should approach this question from a selfish viewpoint. What has our company to gain by such an association? This is a natural question. It is a question which to my own knowledge has been seriously raised many times. But visualize, if you will, what it would mean if there were no association—what it would mean not only to the industry at large but to each member company—to us as individuals. Visualize what it would mean if there were no clearing house for vital data on fares and wages. The association collects this information, verifies it, analyzes it and sends it out over the country. It becomes common-place knowledge to us. We do not stop to think what it would mean if each of us had to depend on his own initiative in order to get this most necessary information.

Your first thought may be that a great deal of this information is not necessary for you and that you really know what the situations are elsewhere enough for your own need. But how do you know what you do know? It is because the association directly and through the technical press has scattered these statistics until we absorb them. We accept them without conscious realization of where we get the information. Too often we do not stop to think of the importance of having available definite, reliable, statistics as to the cost of living and all similar factors entering into the problem of treating our employees fairly. We could not even give our public reliable information as to fares and wages elsewhere so that they might judge as to whether or not we were operating efficiently and economically. Certainly it is sound business acumen to collect, correlate and disseminate these statistics through the medium of just such a national organization as ours.

W. H. Sawyer

We often think of the association as furnishing certain bulletins, pamphlets and committee reports. Too few of us recognize the broader aspects, the broader possibilities of utilizing the association. I care not what your problem may be locally, the association can be and desires to be of help to you.

During the past year there were over 18,000 inquiries asking for information, asking for facts, for data. The majority of this information was at hand and went forward by telegram or by letter immediately. Some of it required research but the association staff understands that it is there to serve the industry and all information asked for is given prompt and efficient attention.

To every company there comes a time when it must appear before a commission or rate-making body in connection with franchise valuation or rates. What a handicap it would be if there were no association headquarters to which one could turn for full and complete information as to the history of the art, as to the facts and findings in other cases. Some companies have not taken full advantage of the valuation and rate data, information, advice and counsel available at headquarters

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but they have been the losers thereby. It has, nevertheless, been invaluable to the progress of the industry.

Taxes and special imposts are at times vital questions with the local company. One of the most important measuring sticks is comparison with other companies, with other industries. At association headquarters such information is available and, moreover, available after having been analyzed by experts who have given these matters detailed study.

Statistics a Valuable Guide

We often refer to our statistical department. Every month you receive statistics as to passengers carried by other member companies. You have come to regard these as essential. You compare your results with others in your territory. You compare your figures with others nationally. This is a valuable guide and yet this service is but a minor routine feature of the work of the statistical department.

If it is your thought that such work is probably of some value but really does not mean much to you or to your company, let me say to you that, if that be true, it is because you are not taking advantage of the opportunity afforded you by this association. Let me say to you that you are not doing your duty to your company or to yourself. If you are not interested in this association, if you do not keep posted as to what it can and is willing to do for you, you can expect to receive only comparatively meager benefits. The company or the individual that gives most freely and willingly to the association receives the greatest benefits. You cannot escape that fact. The value of the association to you lies in the use you make of it.

We have our short comings as an association but I believe that there is no similar association that has its data and information more available or more helpful to its members than the American Electric Railway Association. We are not perfect. Your own company organization is probably not all you would wish it to be. You constantly feel that there are changes which should be made but you do not always make these changes. We are all human, but all in all, the American Electric Railway Association is being conducted not only honestly but efficiently—efficiently from a cold-blooded business standpoint. The dues of the association are appreciably less than those of other comparable associations.

Association Dues Nominal

If it be true that the association is a necessity, if it be true that the association is operating efficiently and economically and is furnishing information absolutely essential to the industry, what possible reason is there why every electric railway in the country should not whole-heartedly support it? The only reason that I can conceive is that even without belonging to the association one can reap many of its benefits.

There are some who possibly cannot afford to pay the association's dues, but if that be true, their next move is to cease operation. Then there are those few who operate a number of companies and get the benefits and service by having one or two of their smaller companies belong to the association. The good work done by the association and the spirit of fair play has reduced the number who take advantage of this possibility to a very small percentage. I consider that association dues are just as normal and requisite a part of operating expenses as are the salaries of executives; both are essential.

As to manufacturer members, there is probably no other comparable association where the manufacturers and the operators work closer or with more co-operation for mutual benefits derived. So far as I am concerned, the manufacturer who does not belong to and support the association's activities thereby signifies to me that he is not interested in the industry and does not want any of our business.

There may be those among you who do not question but that there should be an association but do question its methods, the extent of its activities. The association is operated on the basis of majority rule. Under our present setup it is the association that primarily represents the industry and it must adapt itself, its constitution and its methods, best to meet the problems of the industry as a whole. The history of the association shows, however, that no major move has been made without fully taking into account even a small minority. We must work together as a unit and if after compromises have been made, we are all of one accord with the exception of a small minority, a progressive, constructive program approved by the great majority must prevail.

Association Speaks for Industry

The association's strength lies in its ability to speak for the industry with a single voice of authority, thus enabling it to carry more weight on subjects of vital importance to the industry than could be exerted by individual companies. There is always legislation pending of national importance to the industry, such as that now pending for the regulation of interstate buses. Some organization must speak with authority for this industry. There must be a concerted movement. There must be somebody to appear, to give definite facts as to the electric railway industry. If conditions vary locally, these facts are always brought out. The association does not act to the detriment of any local company, but it does act constructively for the entire industry. It must continue so to function.

The Interstate Commerce Commission is giving thought to new regulations as to depreciation. There must be direct representation on the part of the electric railway industry. The commission must have a clearing house to which it can go for all facts and data regarding our industry and to ascertain the effect on it of any rules or regulations which might be promulgated by the commission. Our national relations committee has analyzed these problems from a national standpoint. Its representatives have appeared, when called upon, to speak for the industry. We have no lobbyists at Washington but the industry must have, when called upon, machinery whereby it can give pertinent facts to Congress, to the Interstate Commerce Commission and to any other such body.

All of Us Profit

It is the American Electric Railway Association that the industry looks to for definite, clean-cut facts, unprejudiced and unbiased. No other agency can fulfill this obligation. We all profit by the inspiration of those whose accomplishments are superior to our own and it is in a mutual association such as ours that we all have an opportunity to profit. The progress of the industry is cumulative and dependent on the extent to which we garner of the fruitful experience of our associates.

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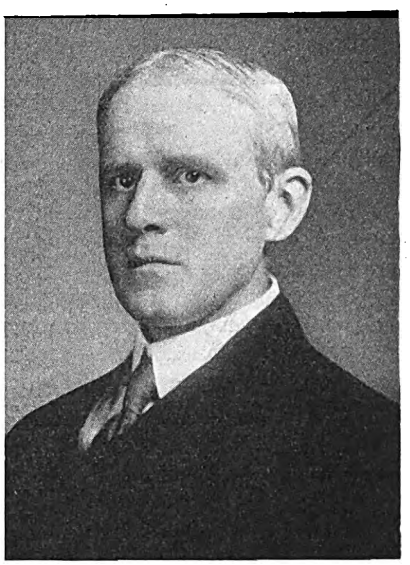
The Economics Of and Need For

Public Participation in City Transportation*

By Henry I. Harriman

President Boston Chamber of Commerce and Chairman Metropolitan Planning Board Boston, Mass.



Henry I. Harriman

WITH each advance in mass production there is an increased tendency for the concentration of population during the hours of work and an increased need of adequate and fuller transportation facilities, so that when work is over people may live at a substantial distances from their labor where land values are less, where real homes are possible and where living conditions are safe and sane. The advent of the automobile has also greatly increased the congestion of the modern city street and made more difficult the rapid transportation of passengers by surface trolleys. Thus all of the great centers of population are faced with the necessity for increased street capacity, either in the form of wider surface streets, overhead ways or underground routes.

I see nothing inconsistent in considering a subway for rapid transit trains as an underground street. There is nothing inconsistent in limiting the use of our streets. We frequently bar trucks from certain streets. We regulate traffic in some streets to the right, and in other streets to the left. We set aside a part of each street in the form of a sidewalk for one class of users, the pedestrians. What is there inconsistent or unreasonable in setting aside an underground street for the conveyance of passengers by rapid transit trains?

In the past the surface street has been paid for by the community as a whole, with occasional local assessments if property values were substantially increased. If we were to follow this analogy then the underground street which is built for the rapid transit train should likewise be paid for by the community. That, however, was not the rule established when the first elevated roads and subways were constructed. There were obvious savings in the cost of transportation resulting from such elevated roads or subways and the precedent was established of either granting a franchise to a local transportation company to construct such routes, or for the community itself to construct them and rent them to a local transportation company at a price which would pay both interest and sinking fund on cost. This was but another way of placing the burden of cost upon the car rider, for obviously the rapid transit company that must pay a rental for its subway must increase its fares to cover such rental.

Thus there have been established two divergent methods of paying for streets. Our surface streets have largely been paid for by the community. Our underground and our overhead streets have been paid for by the persons using them. It therefore behooves us to analyze the real equities of the case and see upon whose shoulders the burdens of additional subways should be placed. Should they be paid for by the community; should they be paid for by the car rider; or should the cost in some way be divided between the various parties interested?

It is generally conceded that the construction of rapid transit lines benefits in varying degrees five distinct groups:

1. It benefits the community as a whole. No one can doubt that it is for the moral, social and economic welfare of a community to make transportation between the place of business and the home easy and rapid.
2. It benefits the car rider, the man who travels daily back and forth from factory to house.
3. It benefits the transportation company by enabling it to carry its passengers more expeditiously on fast subway trains than by surface trolleys.
4. It benefits, in a particular way, certain real estate lying within a reasonable distance of the rapid transit lines.
5. Finally, the automobilist and, in a lesser degree the pedestrian, benefit through the lessening of congestion resulting from the removal of surface cars from the streets.

It is generally conceded that future rapid transit subways will be built and owned by the community and that they will be considered a part of the community's street system. Very elaborate formulas have been worked out defining the portion of the carrying charge of such subways which should be paid by the five parties in interest. The planning board of which I am chairman has had that matter under most careful consideration in connection with metropolitan Boston's need of improved rapid transit, and while we should like to see a diversion of the cost made between all of the five parties in interest, we have concluded that from a practical standpoint there are very grave difficulties in ascertaining the real benefit to certain of the parties.

If there was any definite way of determining the exact betterment resulting to each piece of property from the construction of a given subway it would be most desirable to make special assessments. Any lawyer will tell you that there is great difficulty in such determination. Property near a given subway station is usually benefited more than property at a distance and yet there are instances where local stores have been greatly damaged

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by the construction of a new rapid transit line, as the people who formerly purchased at the local center thereafter ride to the big city and do their purchasing in the large department stores. It is also true that ultimately rapid transit lines will be built in all directions, and that in the last analysis all of the large subdivisions of urban populations will have their rapid transit lines, and thus the benefit to specific properties will merge into the benefit to the city as a whole.

While therefore recognizing the theoretical fairness of special assessments, our planning board has concluded the practical difficulties are so great that it is wise to omit them, though we recognize that where a state constitution permits special benefits to be assessed on a zone rather than on specific properties, they may be both fair and practicable.

There can be no doubt of the great advantage that accrues to the automobilist from the removal of surface street cars, but likewise the automobilist is benefited by every street improvement, whether it be a street widening, the opening of a new route, the resurfacing of an old way, or the removal of trolley tracks.

Our board feels that it would be unwise to impose upon the automobilist any specific tax to cover the cost of subway construction. We would rather impose a specific gasoline tax which will give to the cities and towns help to pay for the improvement of their highways, of which the underground highways for rapid transit are a part.

There are thus left three parties in interest on whom, in our opinion, the carrying charges of new subways should be assessed, to wit, the general public, the car rider and the transportation company, and the benefit to the last two parties can best be assessed in the rental which the transportation company is to pay for the use of the publicly built subways.

Let it be assumed that the sum to be paid to the city as subway rental is 4 per cent per annum for interest plus 1 per cent for a sinking fund which, at compound interest, will retire the cost of the subway in about 40 years. How shall this total of 5 per cent on the construction cost be divided between the general taxpayer and the rental which the transportation company shall pay? I know of no definite scientific formula. Undoubtedly the benefit to the community as a whole, or to a particular zone of the community, is greater for some rapid transit lines than for others. However, our board has concluded that a simple and effective rule is to divide this interest charge of 5 per cent into two equal parts, the transportation company paying a rental of 2½ per cent to the community and the community collecting the remaining 2½ per cent in the form of a general tax.

In the most recent act passed by the Massachusetts Legislature, providing for the extension of the Boylston Street subway, such a provision for the equal division of the carrying charges was enacted, and it is hoped that this principle may be continued in future transit acts. Whether the formula of equal division will work satisfactorily in all cases remains to be seen. If, as in the case of New York, the fare is restricted to 5 cents it will be necessary for the community to bear a larger part of the carrying charges of subways than above indicated, but for the average metropolitan center I am inclined to think that a 50-50 division is reasonably fair, simple of execution and will not impose an undue burden, either upon real estate, the car rider or the transportation company.

Increased rapid transit facilities are a vital necessity in Boston and in many other large cities. It takes years after work is started to complete a subway. In the meantime population is increasing, congestion is growing and the trend to the tenement and the apartment increasing. The vital necessity is for immediate action and the imperative need is that the dirt should fly. Let us not make the mistake of too prolonged debate upon theories of payment while the people of our great urban centers are suffering from lack of better transit facilities.

Regulation of Transportation*

By Lewis E. Gettle

Chairman Railroad Commission of Wisconsin, Madison, Wis.

RECENT statistics indicate that about 100,000 common carrier motor buses and some 3,000,000 motor trucks are operating in the United States. Of the trucks perhaps no more than 40,000 are common carriers. For some time after their advent it was thought that the activities of the trucks and buses would be confined to short hauls, but since rapid transit bus passenger service is offered between New York and Chicago, and Chicago and Los Angeles, and buses are beginning to offer dining and sleeping service, railroads are beginning to look with considerable apprehension on this young but aggressive and optimistic competition.

The general public seems to have been little concerned about regulating these agencies as to numbers, charges or service. Legislation seems to have been promoted chiefly by those engaged in bus and truck operation, who wanted protection in prior occupancy of the field, and by railroads and railroad employees who felt that their interests were threatened. In Wisconsin, until two years ago, buses and trucks were operated in a chaotic fashion. Regulation, when undertaken, was a cautious compromise and yet it has accomplished the establishment of reasonable good, safe, dependable service at some approach to non-discriminatory charges. Taxes are levied upon the basis of passenger capacity and rated tonnage. License fees and fees for the cost of administration are exacted. But no one seems to know as yet what is the just compensation for highway use or what charges should be demanded by the state to equalize costs with those of rail carriers. To the extent that paved highways are used at less than cost to the state the taxpayers are, of course, subsidizing these common carriers.

While the courts have held that the state may exact from interstate carriers taxes or fees for damage or use of the state highways and such carriers are subject to local police powers, routing, charges, revocation or denial of right on highway and like important questions are clearly for the jurisdiction of somebody with interstate powers. Congress has thus far rejected all proposals to regulate interstate trucks, and appears reluctant to pass the bill practically agreed upon by various interests, including state commissions. Congress is no doubt re-

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flecting the obvious popularity of truck and bus service and the widespread belief that trucks and buses are entitled not only to business which rail carriers cannot normally reach, but are also entitled to all the business they can take away from the railroads. This attitude ignores the whole question of costs and does not reflect sound economic conclusions. There is being repeated here a process of thought and legislation strikingly similar to that evidenced in the evolution of railroad and utility regulation.

The task of ultimate adequate control is somewhat appalling but is by no means impractical or impossible. It is quite clear to many of us that while from a number of aspects secondarily there must be the exercise of power by a federal agency, the primary functions of the coming regulation should be exercised by state commissions or groups of such bodies. The Interstate Commerce Commission is most able and efficient, but is shorthanded in many departments because Congress does not provide adequate funds. Even if sufficiently financed that body would, with bus and truck regulation, become unwieldy, its energies attenuated and possibly its functions deteriorated. Buses and trucks are accepted as highly convenient and necessary to the economic growth of the nation. It will be the job of regulative jurisdiction, wherever finally entrusted to mold and fit this young, but awkward, giant into the mosaic of a scheme for properly allocated and related national transportation.

The street railways present the most intricate and varying problem of all the forms of transportation. With us street railways in cities of less than 50,000 population do not, and under present municipal regulatory powers seemingly cannot, earn a reasonable return on the necessary investment. Even with some slight relaxation of municipal requirements, and with fare schedules as high as the law of diminishing returns will permit, the urban railways are having a severe struggle to keep up their roadways and frequency of service in adequately comfortable cars. Yet many thousands of people now depend and must continue to depend on street cars for their daily transportation.

In our state, the Railroad Commission seemingly has all the regulatory powers over street railways which a state body should normally exercise over a service essentially urban in character. The state commission cannot regulate the speed of the cars, cannot determine the routes of the tracks, cannot control other competitive transportation or co-ordinate it with the railway service. Taxation powers lie either with the city authorities or the state tax commission. Paving requirements and changes of grades, except separation at grade street railway crossings, lie wholly within city control.

In a city-wide survey made a few years ago in Milwaukee by the engineers of our commission, it became glaringly apparent that reasonably adequate street railway service to meet present requirements involved many matters lying within local jurisdiction and policy; that metropolitan service covering numerous contiguous cities and villages involved concerted and synchronized action by all of these units of local government. Obviously, a state commission may not be invested with power to grant street franchises, to widen streets or to lay out new streets, to speed up or retard vehicular traffic or divert such traffic from one channel to another.

The commission ordered the company to supply many new cars, fixed standards of loading, directed double-tracking, decreased headways and permitted use of one-man cars, but even the outlay of $1,500,000 required for the improvements and betterments could only ameliorate, but not satisfactorily solve, the plain transportation needs.

Under these circumstances the company proposed at its expense an exhaustive study of the situation by a committee composed of city representatives, company members, representatives of the state commission and a citizens' committee. This committee of twelve controlled the survey and supervised the report. About two years were required to complete the study and make the report.

The actual survey was made by highly expert engineers assisted by the committee, whose knowledge of local conditions was intimate and comprehensive. One of the outstanding phenomena found by the survey was the rapid development of areas which for many years had been considered outside of practical city residence districts. Many of these developments were beyond the city limits and beyond its jurisdiction for any purpose. Later these areas will be taken into the city. The committee found that the traffic congestion in many business areas was so pronounced that the average speed of street cars and buses was barely 10 m.p.h. and this average speed was decreasing.

The remedy proposed is that better vehicular routes be provided, purely a municipal function, and that improved mass transportation facilities be afforded, which is a question for the company and the commission. The report clearly recognizes that numerous local government units must be harmonized and brought into cooperation and that the citizenship must be educated to tolerate changes that will involve hardships and sacrifices for the sake of the general growth and welfare.

It is frankly recognized that the comprehensive plans will require large sums of new capital, to attract which fares, franchise conditions, and all other matters having to do with a fair return must be approached and settled in a spirit of liberality rather than by antagonism.

In Milwaukee the company has no serious problems of common carrier competition. It was alert in supplying necessary bus service and has successfully held that field. I think it will be conceded as fundamental that the whole system of the transportation of a municipality should be under single ownership and control, or at least single operation and control.

Where there is not such unity of ownership, there should be the fullest possible interchanged use of tracks and other facilities, and the regulating bodies should have ample power to compel such joint use expeditiously where it is unreasonably refused. The Wisconsin Commission has such general power and has employed it in several instances. The first case of this character involved a rather long and vigorous contest, centered chiefly on the proper compensation to be provided. Recently a similar case arose, apparently much more complicated than the earlier one, but after several heated preliminary skirmishes before the Common Council and the Commission, what promised to be a protracted and sanguinary war was settled amicably by the parties, guided largely by the principles laid down by the Commission in the earlier case.

I have not spoken at such length of the Milwaukee efforts to approach this problem in a sane, non-political, scientific way, from provincial motives. It is merely a presentation of concrete conditions that should indicate a departure from the ancient, fruitless wrangles, which recognizes that adequate fares and schedules must be provided by the regulating commission to produce, if possible, a fair return on the investment.

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The Effect of Automobiles on Mass Transportation Traffic*

By R. F. Kelker, Jr.

Kelker, DeLeuw & Company,
Chicago, Ill.

R. F. Kelker, Jr.

IT IS beyond question that by reason of the tremendous number of automobiles in use the public transportation agencies are carrying fewer passengers than they otherwise would be. There is no doubt that in cities with a population of a million or less the automobiles have caused serious decreases in traffic, but in the larger cities the loss in traffic due to automobile competition appears to be inconsequential.

Failure to expand the rapid transit facilities in Chicago is a factor which has had as much, if not more, effect on the traffic carried by urban mass transportation lines than the private automobile. Statistics showing the growth in Chicago suburban traffic are not readily available for all suburban lines, but the number of suburban passengers carried to and from the central business district on a typical week day by only one of the important steam railroads increased over 140 per cent during the past ten years. This is another indication that the private automobile is not responsible for some of the traffic losses of the urban transportation lines.

The accompanying table compiled from reports on fairly recent traffic surveys made in various cities is a good criterion of the relative importance of the private automobile and the urban mass transportation agencies.

It will be seen that the private automobile carried from 22.3 to 28.5 per cent of the passengers, the average being 25.2 per cent.

It is interesting to note that studies made show that the use of the automobile by patrons of stores in the central business district varied from 8.1 per cent in Chicago, a city of 3,000,000 population located in the center of a large metropolitan district, to 24 per cent in South Bend, Ind., a city of about 85,000 population located in and surrounded by an expansive agricultural district. It would appear from this that where mass transportation facilities are conveniently available they are used instead of the automobile. The density of population in the smaller cities rarely ever warrants the operation of a system of mass transportation lines which makes the service conveniently accessible to the entire population of the city itself and it is certain that the service cannot be made accessible to the surrounding rural districts at a popular rate of fare, hence the greater use of the automobile. On the other hand, in the larger cities, a sufficient number of lines to make the service convenient can be operated if the transportation system as a whole is on a profitable basis. Street railways make the central business district easily accessible from practically every section of Chicago, and, in addition, the rapid transit lines make it easily accessible for persons residing in about 20 per cent of the area of the city.

We find from further studies that 12.6 per cent of the persons canvassed in the central business district of Baltimore used the automobile, compared with 21 per cent in Detroit, the great automobile manufacturing center. It is interesting to note that in both cities the percentage of automobile users in the outlying districts was only slightly in excess of that in the central business district even though, as it is reasonable to suppose, parking spaces in the outlying districts were more plentiful.

There is good ground for the belief that as traffic congestion increases and less parking space is available, the mass transportation agencies will retrieve a certain portion of their losses in traffic caused by the use of the automobile. If, however, losses are to be turned into increases, it will be necessary to offer a service that is as fast, convenient and comfortable as is consistent with a reasonable rate of fare.

TABLE I

Counts of passengers entering and leaving the central business district of several cities, showing number and percentage using private automobiles and urban public transportation facilities:

City	Passengers		Per Cent	
	Private Auto	Street Car, Taxi and Bus	Private Auto	Street Car, Taxi and Bus
Baltimore	209,794	539,582	28.0	72.0
Chicago	325,524†	1,132,030*	22.3‡	77.7
St. Louis	142,819	353,474	28.8	71.2
San Francisco	176,891	516,493	25.5	74.5
	855,028	2,541,579	25.2	74.8

*Elevated railroad (rapid transit) passengers included.
†This number would have been smaller and the number of passengers carried by public transportation agencies larger had taxicab and private auto passengers been counted separately.
‡Per cent greater than it would have been had taxicab and private auto passengers been counted separately.

How can such a service be provided?

One of the first steps should be the development of plans for the replacement of obsolete rolling stock. There is today, throughout the nation a large number of street cars in operation that are so obsolete and inefficient that maintenance charges are excessive and their continued use makes for poor service, with its consequent loss in traffic.

Such plans, along with the development of a program having as its objective the most efficient operation should be prepared and carried out.

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Among other things, this program should provide for: (1) modern motors; (2) faster acceleration; (3) high operating speeds and good brakes; (4) the elimination of avoidable delays due to defective equipment; (5) a reduction to the minimum of delays caused by street traffic or by improper routing of street car lines; (6) a reduction of loading and unloading time, by providing sufficient entrance and exit and platform space on cars and by installing loading zones, facilitating the collection of fares and the issuance and collection of transfers, and the elimination of non-essential service stops; (7) abatement of noises due to loose parts on rolling stock, and poor condition of track and roadway and (8) construction and operation of rapid transit lines where traffic densities warrant and where the cost can be allocated so as not to become a burden to the car rider.

In a word, the objective should be the operation of comfortable, clean, well-lighted and attractively-painted cars on good tracks at the fastest speed consistent with safety.

H. C. Heaton

Recent Developments in Arc Welding of Rail Joints

By H. C. Heaton
Superintendent of Tracks United Electric Railways Providence, R. I.

ELECTRIC welded rail joints came into use during the World War period when it was impossible to get money, labor or material with which to make proper repairs to track. It was thought that by the insertion of short pieces of rail, commonly known as "dutchmen," having the same wear as the adjoining rail and fastening these pieces by welding at the top and bottom of long plates, that quick and satisfactory repairs could be made. However, owing to the impossibility of obtaining dutchmen having exactly the same wear as the existing rail, and obtaining perfect contact in the fishing section, they soon became loose, the welds broke in the seams and the joints were a failure.

Electric welding of joints was then tried on new rails. At first dependence was placed on the welds themselves; consequently bolts and nuts were removed after the plates were welded. Within a short time this practice was changed and since then the bolts and nuts are left in place and the ends of the bolts spot welded to prevent loosening of the nuts.

In the first plates used the location of the plates with respect to the web was very much the same as the bolted plates then in use. There was a bevel at the top of the plate and a single rod was laid in the groove under the head and under the lip of the rail and welded into place. Another rod was laid at the bottom of the plate and welded so as to form a contact with the plate and the base of the rail.

A few years' experience showed it was difficult to weld under the head and under the lip; therefore the plates were moved outward and the beveled slope was changed to a ledge. The theory of this change was that the recessed ledge under the lip and the head provided better means of locating the seam metal properly. This recessed ledge provided in the seam weld for more of the ductile welded rod metal and less of the embrittling rail metal, which contains a high amount of carbon.

About the same time, the length and position of the welds were changed, and the rods were fed by hand. At the top, the welds were stopped 3 in. from the ends of the plate, and at the bottom no welding was done for a distance of 1½ in. each side of the rail ends, but the welds were carried from these points to within ½ in. of the end of the plates. The hand feed method of welding permitted a lower welding current, a greater puddling and refinement of the arc, and a greater quantity of welded metal. Furthermore, the seams were more efficiently located by this method for the operator had greater control of the welding process. The hand feed method therefore produced welds which were vastly superior to the former methods. The next change was, that in the top seam for a length of 10 to 12 in. in the center of the plate a second layer was placed and likewise one on the bottom seam beginning at the end of the weld near the rail ends, and extending for a distance of from 5 to 6 in. This second layer strengthened and annealed the first layer so that the weld was more homogeneous.

Originally great stress was laid on preheating the rail and joint plates along the line of the seams and post-heating the seams after the job was completed. On account of the larger amount of metal used in the seams, and consequently the longer time needed to make a complete joint, opportunity is given for the heat to spread almost entirely through the plates and for a considerable distance through the rails at the joints. This means that the cooling will be more gradual and the resultant stresses smaller.

Many plates were originally planed from flat bars but for the last three or four years manufacturers have been rolling plates for this purpose. They have an advantage in that the ledge in the top can be rolled slightly beyond the outside vertical face of the plate and also a greater fishing surface can be obtained, both at the top and bottom. This gives not only an improved mechan-

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ical joint but also provides better welding conditions as the welder has a clearer view of the base seam weld at all times.

From the beginning, some engineers used base plates in connection with welded joints, and others claimed their use was entirely unnecessary. Today with the almost universal use of tie plates, base plates are now regular practice and they are welded to the base of the rails for 10-12 in. from the center of the plate. These seams are also double welded about one-half of the distance each side of the rail ends.

The best practice today is as follows: Rails are obtained which are slightly undercut, at least from beneath the head. Rolled plates are installed and partly bolted. Drift pins are now driven to force the rail ends into the closest possible contact; bolts are then fully tightened and the ends of bolts and nuts spot welded to prevent loosening. Rails and plates at both top and bottom are preheated by drawing an arc along the face. Welding is now started, care being taken to begin on the seam which will bring the joint to the most perfect line and surface. On the top seams, double welding is placed from 10-12 in. in the center. In the bottom seams, double welding is placed starting near the rail ends and extending about one-half the length of the welds. With the plate seams completed, the base plate is welded. In the seam along the base plate, double welding is done about equally each side of the rail ends for a distance of 5 to 6 in. The best designed plates provide that no two welds shall begin or end in the same vertical plane.

Soon after the welding is completed, the surface of the rail should be ground with a grinder.

In 1925 an experimental installation was made of a new type of joint by Mr. Moisselle, the inventor. The joint used a series of rods, each with an offset loop opposite the rail ends. The first rod was placed on the outside of the base, the next on the fillet connecting the web and base and then two rods on the web above the base with offset loops horizontal. The rail was P. S. Co. 90-200, 9-in. flat tram girder, which had been in service about 30 years. The track was laid in the center of an old turnpike. Continual resurfacing of the shoulders had built them up so that the track was the lowest point and acted as the gutter for the entire street.

We installed sixteen of these joints. The rods used were 1 in., except for the rod in the fillet connecting the web and base, where owing to the corrosion on the base it was necessary to install a ½-in. rod. These joints were placed during the late summer of 1925 and were removed during the summer of 1926.

To my surprise only one out of the sixteen joints failed and that broke through the web and base a short distance beyond the ends of the rods. When removed the other fifteen joints were in much better condition than any other joints in this stretch of track. The majority of the joints were bolted plates, some second hand and some new. Owing to the excessive wear on the head, it had become bent over and the wedging effect of the plates cracked the head of the rail through the thin fillet under the gage line.

In May, of this year, 176 of these joints were installed in Providence, R. I., on various rail sections, all of which had been in service from ten to fifteen years. So far all of these joints are in excellent condition. In all joints better results will be obtained if the head of the rail is ground with a reciprocating type of grinder for a distance of 3 or 4 ft. at the joint.

Opportunities for Improving Quality of Service*

By P. S. Arkwright

President National Electric Light Association and President Georgia Power Company, Atlanta, Ga.

THERE was a time when only the rich rode in carriages and there were not many of them, either. That was when street railways had their beginning. The street car was called the poor man's carriage. It had to fix a low rate of fare, and it had to have low operating expenses to come within the low rate of fare.

When the lines were electrified, the principles of the horse car, the low fare and the flat fare, regardless of distance, were continued and other burdens were added. When the war came and lifted the level of our costs, we were fixed in the public mind with a low rate of fare, and our efforts to keep that fare sufficient to cover our costs led us to greater efforts at saving. Coincident with that came the swift-running automobile that everybody wants.

It has only been recently that we have changed our own attitude toward our business. During the last three or four years there has been more improvement in street railway operations than in the whole history of the industry, since the advent of electric motive power. We have come to the one-man car and the light-weight cars, economies that do not injure the service. We have come to the faster running car, to the car with the quicker pick-up, to the higher paid and better qualified employee. We are coming rapidly to the brighter colored car. We are giving more attention to frequency and reliability of schedules.

It is a little difficult for people that have been engaged in a non-competitive business to get the sales spirit in business, but we are getting it in the electric railway industry. One of the troubles we have had is to get away from the original idea that we must curb expenses, regardless of the effect on service. The American people will pay extravagantly for other forms of transportation. They want luxury in travel. They don't want a poor man's carriage. They want transportation that they need not be ashamed of.

The street car certainly affords the safest transportation in the city. It is safer for the person, safer for the pocketbook, and safer for the reputation than if people ride in automobiles with strange people. It is a transportation that relieves passengers of all worry. It is getting so that it takes less time to go down town in the common car than it does in the private automobile with the congested streets. We should have no trouble in getting paid for the right kind of service. Let us come into our own with an attractive method of transportation and insist on getting sufficient remuneration to pay for it.

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Applying Modern Merchandising and Selling Methods to Transportation*

Charles Gordon

By Charles Gordon
Editor *Electric Railway Journal*

MODERNIZATION as a general topic has now been before the industry for four or five years. When the word was first introduced, it was quickly taken up in discussions of the industry's problems. But for a considerable period—several years in fact—modernization was a general and an abstract term that sounded good, seemed to describe an objective for which we should all strive, but failed to register in the minds of the big majority of railway men.

Modernization in Its Broadest Sense

Although modernization seemed to be something desirable for the industry we failed at first to interpret this general term into its concrete applications to transportation management and operation. But by far the great majority of the industry is now alert to its problems and has a much clearer understanding of the part which modernization should play in the several branches of our business than was true several years ago. In fact, we are modernizing not only our equipment and our service and our personnel, but we are modernizing our conception of the nature of our business. It is not strange, therefore, that we find the subjects of merchandising and selling on the program of a railway convention. But how strange they would have sounded even as recently as ten years ago!

Most of us know what these terms mean generally, and we accept without serious question the statement that sales promotion and distribution technique are vital factors in modern business. In fact, we have already accepted the need for advertising—one phase of merchandising and selling—and have had enough experience with it to realize that to be used successfully in the transportation business advertising must be directed with an intimate knowledge of the business itself, and expert understanding of advertising technique. But we do not have a clear conception of the several other phases of merchandising, or just how to go about their application to transportation. Only a few years ago, we were debating the justification for the use of advertising. So today, some of you may not agree with me on the need or the importance of some of the other merchandising measures I am about to discuss.

Merchandising includes the entire field of distribution. It includes not only selling, but the determination of the character of product that can be sold, the price which the customer can be induced to pay, the appeals that will lead him to buy and the sales resistance to be encountered. Back of selling and of advertising, must be a merchandising plan, worked out with full knowledge of all conditions which may effect the distribution of the product. Unless such knowledge and such a plan exists, selling and advertising are at best merely spasmodic, ineffective and inefficient.

To proceed now with the further application of merchandising to the transportation business: First of all we want to know whether the transportation business justifies considerable expenditure of money and effort for merchandising activity. The first questions are, "What is the potential market for the product?" "Has it a certain 'natural' demand?" In other words, do people need it and want it, and do they buy it in considerable volume with little or no sales pressure? Is it a necessity or a luxury? Does it fill a real public need or is it merely a fad? It is generally accepted as a first principle that a product which fills a real public need and which is bought in considerable volume rather than sold offers the most attractive possibility for sales promotion effort. Obviously, transportation service meets these specifications fully and therefore properly planned merchandising effort may be expected to bring results.

We have talked about merchandising and selling to the extent that there are some who assume that the industry is now actually carrying out a complete merchandising program. As a matter of fact, there are only a few instances where even a good start has been made in this direction. Some of you may be inclined to the opinion that the industry has done all it can expect to do in winning back lost patronage and building new. I am convinced that to achieve its proper place in the sun of prosperity the local transportation industry, since it has

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become a competitive business, must go further than it has gone or even now generally agrees is necessary toward applying modern methods of meeting competition.

Is there a railway property in this country that feels that it has cars which meet to the fullest extent practicable, the public's desire to ride in fast, attractive-looking, quiet, easy-riding, smooth-stopping and starting vehicles? We have made only a start toward providing that type of vehicle, and until we carry the job much further, we haven't made the product right, and therefore we haven't the primary requisite for successful merchandising. We have no other recourse. All talk of merchandising and selling is futile until we recognize that competitors who are constantly improving their product will continue to cut into our business unless we in turn provide a service which people will want to buy in a competitive market.

It is true that increasing traffic congestion is working in our favor, particularly in the larger cities. But it would be fatal for the industry to sit back on the assumption that congestion will ultimately drive business back to public vehicles. We all know that public transportation plays a vital part in the development of a community, and that it would be an economic blunder even to attempt to dispense with it. But it is important that we do our part in aiding our communities in the formulation of intelligent and economically sound traffic relief measures, and that at the same time we bend every effort toward increasing the popularity of public transportation through improvement of the character of service which it provides. In that way, and in that way only, may we hope to profit from the opportunity offered by growing congestion. We must make our product right. That is above all, the first step in merchandising transportation.

Next to making the product right, comes the question of determining the price at which it is to be sold. Low price alone is not sufficient. But it must have a proper relation to quality in order successfully to meet competition. Obviously, the determination of the minimum price at which a service of given quality can be sold involves an accurate knowledge of the production cost. Here we open a field which is prolific in possibilities for the transportation business. True, the price of our service is subject to the restrictions of franchises and regulatory bodies. But the testimony before regulatory commissions indicates no general accepted method, even among transportation men themselves, of determining the production cost of transportation service for various classes of customers or the prices at which it should be sold to each class of users. The merchandising of a utility service is distinctive in that the load factor as well as the total volume of business is extremely important in its effect upon the production cost. This is recognized in the making of telephone and power and other utility rates, but has been almost entirely neglected with respect to transportation. Furthermore, not only do we not apply generally the principles of a readiness-to-serve charge, or a maximum demand charge, or a reduced rate for quantity usage, but we go even further in the widespread practice of charging a flat city fare, and fail even to charge in accordance with the amount of service used.

Habitual recourse to expediency stores up trouble for the future. The local transportation industry today is suffering from the expedients of the past. It stands almost unique, in that the principle that the consumer should pay in proportion to the cost of the product or the service that he buys, is not recognized. When this simple economic principle is abandoned strange incongruities arise. There is little wonder that we find so much difference of opinion in attempting to fix an equitable and satisfactory rate of fare.

There is need for more attention to the problem of breaking down the cost of giving service in a way that permits comparison of the characteristics of different properties, and a determination of the effects upon transportation costs, of certain fluctuations in load. For example: fluctuations in the total number of revenue passengers on a city system are very misleading. An increase may be almost entirely in the rush hour; if it continues, we buy more cars, provide more maintenance space, add power and feeder capacity. For a very large part of the day all of this is idle. Gross revenue goes up slightly but fixed charges and operating cost go up more and net profit is lower. We can't take off peak service because the cars are jammed. So we fight the rising operating cost by trimming off-peak service and thus tend to encourage the very trend which is causing the trouble. That trouble is attributable to a progressively poorer load factor. Nevertheless, we do not have a generally accepted measuring stick for load factor on a transportation property and therefore it is obviously difficult to evaluate the actual effect of variations in the number of revenue riders or fully to determine the significance of fluctuations up or down.

There is some recognition given now, through the sale of various forms of passes, to the concession that should be made to wholesale users of transportation service. There is likewise some recognition given to the need for a differential in fare between week day, and Sunday and holiday riders. Through the sale of tokens or tickets there is some differential between the intermittent and the regular user's gate.

Some properties have made considerable progress in adjusting rates for various classes of riders so as to give at least some recognition to the cost of providing different classes of service. But the industry as a whole is still a long way from recognizing fully the various factors which affect the cost of service, or of devising uniform measuring sticks so that the conditions on two properties may be fully compared in a study of the rate to be charged. I recognize fully the practical limitations in a local transportation rate structure; the importance of simplicity and the difficulties of fare collection and accounting. Nevertheless, under the condition of severe competition which we now encounter, it is extremely important that we know more about the cost of service to various classes of customers if we are to be in a position to establish prices for our product which will permit it to be sold most successfully. So much then for the second item in merchandising, that of determining the price at which the product is to be sold.

There is still a third factor in merchandising and sales promotion that should likewise be interpreted into transportation terms; that is, "market analysis." The modern merchandising man studies the distribution of his product with a view toward determining the potential sources of new business. He wants to know something about the size of the market, the nature of the competition, the buying habits, the sales resistance, and the appeals that will influence buying.

There is nothing particularly new about this. It is a method long recognized among merchandising men in general business, and we must apply it to transportation if we are to merchandise our service successfully. First of all, we need to know something about the buying

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habits of our present customers. We need to know for transportation purposes, where they come from, where they go, how they travel and when they travel, where they live and where they work, the routes they follow, how far they walk, and the reasons for using our service one day and not the next. We need to know as much as it is possible to learn about our present customers, before we can determine how to go about increasing our patronage.

We must visualize accurately the people to whom we are appealing. Any other procedure in merchandising, selling or advertising is extremely wasteful and foredoomed to failure. A successful merchandising man makes an analysis of his market. He classifies it in accordance with buying habits and preferences and then concentrates his effort on that class of prospects to whom his product will appeal most, whom he can serve best, and in whom he will encounter the least sales resistance. Who uses automobiles for ordinary transportation purposes in your town? Where do they live and why do they use their cars? That information may prove that it is entirely futile to launch out on a campaign to induce the auto users on a given line to leave their cars at home and use your service. Some change in the service itself may be needed before increased patronage from auto owners can be expected.

Without constant attention directed toward discovering potential sources of business, there can be no really intelligent merchandising. When losses are suffered from competition, there must be a careful study of the competitor's business as well as our own. I think one of the common fallacies regarding local transportation is that the prospective traveler makes a conscious choice each day of the kind of transportation he will use. A moment's consideration of your own experience will indicate that this is not true. He establishes a habit of using a particular agency and continues that habit until he is for some reason led to make a change. This applies to the use of an automobile for many purposes. In some instances the habit was established when the automobile was much more desirable and attractive than it is today because of less congestion and parking difficulties.

All of this comes under the classification of market analysis. We are not selling merely individual rides but are selling the habit of using our service. Every new regular rider means an indefinite period of transportation business from a regular customer. That is the basis from which, it seems to me, the industry should judge the justification for such work as I have just outlined.

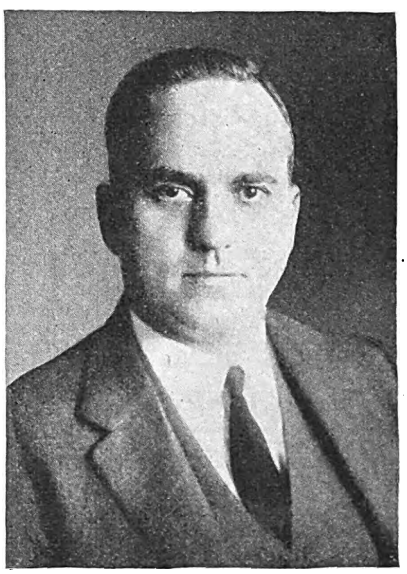
These then, are some of the high spots of the job of applying modern merchandising and selling methods to the transportation business. Repetition of these phrases will do us little good unless we translate them into transportation language and then proceed with the actual application to our industry of the methods that have been proved by experience in other business. I have tried to break down the term merchandising into some of its more important factors, and to illustrate what its application to the transportation business involves.

The local transportation industry is headed decidedly in the right direction. As it continues to climb we shall find it necessary to give constantly increasing attention to these questions of improving the quality of our product, determining proper selling prices and studying the characteristics of our market—all parts of the job of merchandising transportation.

Opportunities in Mass Production Methods*

By W. T. Rossell

General Manager Pittsburgh Railways
Pittsburgh, Pa.



W. T. Rossell

FOR the past ten years, the street railway industry has been struggling to maintain its position in the transportation scheme against many unfavorable factors such as fixed income versus rising costs and the fast growing competition of the private automobile and the public bus. But notwithstanding the encouraging strides that have been taken, the need for improvement in methods of maintenance and operation was never greater than at present, and in response to this demand, the methods of mass production must come more and more into use by electric railways. There is opportunity for a much wider application of these principles.

Track Construction Methods Well Advanced

In the track department the greatest advance in method appears to have been accomplished in the construction of new track, due to the relative simplicity of this operation. The successive steps involved in the renewal of a piece of track in paved street are generally well known. First the worn-out track is removed by the process of jacking out or lifting by some form of crane, this work proceeding at the head of the line. Next comes the steam or electric shovel to remove the grading, after which the ditch is trimmed and rolled. Then follows the placing of ballast, ties, rail, concrete, and paving, the pro-

*Abstract of an address delivered at the annual convention of the American Electric Railway Association, Cleveland, Ohio, Sept. 22-28, 1928.

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cedure and order being dependent upon the method of construction.

In many cities, this work is done with commendable efficiency, each part of the job being carried on as a specialty by well-trained employees, while the flow of material keeps pace with the progress of the work. The construction gangs are, in general, well organized, each section carrying out its portion of the labor with dependability and dispatch. However, the dependence of one part of the work upon another is so marked that, if a breakdown occurs in any one part of the construction, the result is reflected in a delay of the work as a whole.

Thus within recent years the principles of mass production have been carried out with great success in connection with the construction of new track. In the maintenance end of trackwork, however, there still remains much to be done before the greatest efficiency can be obtained. The ordinary system of track maintenance uses small and isolated gangs of men, with a foreman in charge of each, who carries out the details of the job according to his individual ideas. These foremen report to a roadmaster or superintendent who is charged with the quality of the maintenance, but observation brings out the great inefficiency of this work as it is now performed.

Any detailed plan which might be laid out for the carrying on of this work would, of course, later be proved wrong in many respects through the method of trial and error. However, a general outline is suggested:

1. That the gangs be grouped into much larger units than at present, with a general foreman in charge of each of these larger groups, which may then be subdivided into smaller groups, each under a foreman.

2. That an engineer or inspector and a material man be assigned to work with each of the larger groups. That the engineer proceed ahead of the work, carefully laying out what should be done. That the material man, in conjunction with the enginer, then provide and place all necessary material where it is to be used.

3. That a careful study be made to determine what tools may be used in connection with this work, such as small cranes, welders, cutting torches, tamping tools, etc., and that these then be provided.

4. That such automotive equipment be provided as required to make this force of men and materials mobile.

5. That the organization of this force of men be along functional lines; that is, one group under a foreman to remove the paving, clear out the openings, clean the rail and prepare the work; another group to place the rails or joints, or such other work as is needed, doing all of the necessary trackwork, and another group to follow up, doing all such paving and cleaning up as may be required to complete the job. That the engineer then make a final inspection of the work.

6. That a plan be worked out whereby such a force of men pass over all the track in a given district or system at certain fixed intervals or periods.

Although this outline is necessarily incomplete, it nevertheless brings out the three essential factors included in the work: first, mobilization; second, specialization; and third, periodical overhaul. The similarity between a maintenance gang, organized as suggested, and a track construction gang, is very evident.

Although the work of the overhead lines department appears to be greatly different from that of the track department, they have in common the need of making the forces mobile. In new construction, the placing of overhead wires, feeders, poles, etc., considerable progress has been made, as in trackwork, in methods of mass production. It may be seen in the use of pole hole-digging machines and automotive equipment in stretching feeders and wires. In general, this work is well organized.

However, in the maintenance of overhead lines, as in track maintenance, there is usually found a woeful lack of organization. As recommended in trackwork, the organization of a larger force, under a general foreman, and the placing of an inspector and a material man with this group, are suggested. Careful inspection at periodic intervals of all overhead lines, and the follow-up by a specialized crew of workers, each performing his part, would show amazing results in the improvement of overhead line work and the reduction of costs.

Specialization Needed in Shops

In the maintenance of rolling stock, the many parts involved often give the work an appearance of great complexity, and cause confusion. It is consequently necessary to analyze the work to be done and break it down completely into its functions; then to organize the men and machines in such a way as to give the greatest possible degree of specialization. As an example of this, the work may first be broken down into: (1) car painting, (2) car body repair, (3) wood working and (4) sheet steel working. This, in general, covers body repair.

Again, the electro-pneumatic equipment may be broken down into: (1) benchwork, and (2) assembly on the cars. The truck may be separated into: (1) stripping, (2) winding, (3) motor assembly, (4) bearing department, (5) wheel and axle shop, and (6) truck assembly. In addition, there are the blacksmith shop and machine department, which do work for all other departments. Finally, there is the storeroom, responsible for the delivery of material.

These departments should be considered individually and further divided for specialization. Then, wherever there is sufficient volume of one kind of work, as in truck assembly, the regular production line similar to that used in manufacturing plants, should be established, and the number of men required for a definite production should be kept employed at all times, having the material and the truck move forward, reaching the end of the line completely overhauled. Descriptions of these methods have been published from time to time in the trade journals, and a detailed account of them would be superfluous.

As in other forms of mass production, these methods indicate clearly the need of special tools and jigs, a number of which have been developed. Automatic wheel welders, air-operated wrenches, jigs for pulling bolsters down into position and moving wheels and motors, have been devised on various properties. All methods should be checked for opportunities of specialization, since any change in method making for greater specialization is usually sound.

Opportunities in Carhouse Routine

In carhouse operation, the value of specialization is again unquestionable. The worthwhile results of bringing cars, so far as possible, to a central point for routine inspection, maintenance, and cleaning, and the use of tools such as vacuum cleaners, washing machines, cutting torches and special ratchet wrenches, are all too obvious to discuss.

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Although this discussion has centered principally around the relation of mass production methods to maintenance and construction work, the methods and principles described are equally applicable to transportation department activities, to office work, or, in fact, to work of any character.

The first requirement in adopting mass production methods is a detailed analysis of what is to be done. Next it is imperative to organize the men and machines available for the purpose, to perform the parts of the work with the greatest possible degree of specialization. After the rates of speed on these different parts are balanced and brought to a common level, the work will proceed in harmony. Then the process becomes repetitive.

Through specialization and simplification of the different parts of the work, the need of additional machinery to replace labor, and the need of improved design, are emphasized. The necessity of seeing that an adequate supply of material is available, and that each part of the plan functions smoothly, and at an even pace with all other parts, requires more and more careful planning of detail.

For the development and improvement of mass production methods through organization, supervision must be open-minded and willing to try new ways, and must constantly plan to improve each part of the organization. The greatest asset that an organization or an industry can possess is adaptability to meet continually changing conditions.

What Are the Financial Results, Achievements, and Future Needs of Modernization?*

By Henry G. Bradlee

Stone & Webster, Inc., Boston, Mass.

SURMOUNTING of obstacles by the transportation industry during the past decade, and its ability to progress in spite of the many difficulties encountered, are conclusive proof of the fundamental soundness of our business and its vital position in the social and economic life of our communities. It seems axiomatic that any product or service vitally necessary to the comfort, welfare and convenience of the great masses of people can with proper management be sold on a remunerative basis. However, the transportation business as an industry is not doing this today. The results being secured by different companies vary from success to failure, but for the industry as a whole the results are not satisfactory. Comparatively little new capital has been secured from the public in recent years, but refinancing of bonds and other forms of indebtedness, and capital for improvements call for rapid restoration of credit. This is possible only through the adoption and execution of a plan which has for its purpose modernizing management, facilities and service in keeping with the changed condition in our industry.

Since the inception of urban transportation, several basic changes have occurred. Periodical improvements in facilities and service, and the results secured from each of them, furnish a background of great value in determining the program of the future. The first major problem, the transition from the horse to the electric car, was largely technical, involving engineering design and construction standards required to make electric rail service practical. This problem was solved by the geniuses who, with their worthy successors, are now masters of electrical and mechanical problems. Today's call is for the merchandising genius who can visualize the vehicle which will appeal to the public and which can be operated at a profit to the industry.

Next came the period of inflation, attended by increased wages, material prices and operating costs. These were overcome in a major way by economies secured through development of labor-saving devices, lighter-weight equipment, one-man car operation and improved maintenance methods. The third object was overcoming the fetish of the 5-cent fare and other objectionable requirements of franchises of the horse-car days and of the earlier franchises secured under highly competitive and speculative practices prevailing at the beginning of the electric railway period. Coincident with fare difficulties competition by the jitney and motor bus developed, but the unsoundness of a uniform or fixed fare and of competition as a substitute for regulation of rates and service has been fully demonstrated.

Present difficulties are the outgrowth of private automobile development which offers competition that stands as a challenge for convenience, speed, luxury and style. To meet this challenge requires new facilities, a more attractive service and the application of modern merchandizing methods which have been so successfully applied to the sale of products less attractive than public transportation. Service may be essential or highly marketable, but the profit to the seller must depend upon his efforts. One of the chief difficulties in our failure to retain or restore the position of our industry has been

**Abstract of an address delivered at the annual convention of the American Electric Railway Association, Cleveland, Ohio, Sept. 22-28, 1928.*

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the lack of a definite program to be followed. No field can be successfully invaded or its opportunities developed without a complete survey and vision of the results which should be secured by the application of individual effort and business methods. The future of our industry depends upon our ability to determine its needs and decide upon a general policy to be pursued by the management of the various companies in developing a definite program along which to work.

Modernization to meet future needs requires not only improved facilities and methods, but must include the rejuvenation of management and men. The printed rule must be replaced with individual interest and initiative. Responsibility for results must be charged to each individual employee. Each patron is a potential competitor who can provide his own transportation. He requires individual attention, his special needs and those of his neighbor must be studied, ascertained and provided for by whatever vehicle and with whatever class of service may appeal to him. Service which is required by one may not be practical for others. Therefore, various classes of equipment and service will be needed to provide for the requirements of everyone.

Speed is one of the essentials for every class of service, and to secure it traffic problems are encountered. The responsibility for traffic regulation is normally assumed by public authorities, but if satisfactory service is to be rendered by public transportation companies, our management must become a real factor in creating a public understanding of the mutuality of interest in conservation and utilization of the public streets.

Merely to ascertain and provide transportation requirements of present and potential customers does not necessarily mean that the maximum of patronage will be secured. Sales effort must be added.

Modern sales methods have greatly accelerated the use of private transportation, and for maximum results the same principles and effort must be applied to public transportation. Selling must extend beyond the solicitation of patronage. A major part of the merchandising program should be devoted to a public understanding of the kind and character of service which benefits the people as a whole. It should include inauguration of new types of service, adjustment of present schedules, abandonment of unnecessary rail lines, and rerouting of others, proper use of street space, the proper price which should be paid for a ride, and the convenience and value of the service as a whole. One of the mistakes of the past has been our dependence upon an understanding with the public authorities and their presentation of our problems to the public. A modern public should have its appeal, and the action of the public authorities should be relied upon as representative of public opinion.

Experience has demonstrated that modernized equipment, when properly merchandised, has increased the number of riders, or minimized the loss of traffic on lines where such equipment has been operated. Through modernization and co-ordination of the modern bus with rail service, public confidence is being re-established in the ability of the industry to provide a service in keeping with the present needs, and in response the public is regarding increased fares as being justifiable and necessary.

The six following objectives will form a working basis for development of a specific program, which is one of the chief needs of our industry:—

1. Provide a service which will be popular with the people and which will command a price commensurate with its cost. Experience has demonstrated that people are willing to pay an increased price for a higher quality of service. This fact definitely eliminates further attempt to develop the art of transportation to conform to a uniform fare. Short-haul riders do not require speed which is so essential to suburban residents. The furnishing of de luxe service necessitates logical co-ordination of bus and rail cars. Rapid transit is known only to the metropolitan areas, but the flexibility of the bus makes possible the operation of preferred service at preferred rates, giving the equivalent of rapid transit service to cities outside metropolitan areas.

2. Preserve the integrity of the present investment, but only to the point where its economic value will be utilized. Preserving the integrity of investment in permanent track and paving is an economic possibility and essential for preservation of the credit of the industry. The new creations in rail equipment now on exhibit have service and economic possibilities which justify their purchase. In their refinement and improvement every effort should be made to reduce rather than increase the initial price which, with some of our modern equipment, is more than operating results will justify.

3. Minimize non-productive capital expenditures. Street improvement programs and other burdens imposed by municipalities have required much unproductive capital which may in the future be reduced to a minimum by substitution of bus for rail service.

4. Combined rail and bus investment and earnings for the purpose of determining allowable return on the investment in the system as a whole. Unless developed as a unit the use of rail and bus facilities cannot be co-ordinated to best advantage in improvement of service, economy of operation, or for the preservation of credit needed to finance the co-ordinated plan. Retirement of abandoned property and provision of adequate reserves for current depreciation of buses and other property in use is not an impossible undertaking but will prove a severe test of the financial strength of many companies. To maintain its credit through this period the full economic value and earning power of a co-ordinated system is necessary.

5. The result of the program should be forecast over a period of at least five years, the soundness of the plan determined by the eventual effect it will have upon the balance sheet, and the credit position of the company in the security market. Re-establishing credit for the industry calls for the restoration of confidence of the investor, who depends to a great extent upon the banker. To convince the banker that the industry is entitled to credit a definite program forecasting annual capital requirements, net earnings from operation, the retirement of property, and the reflection of these in annual balance sheets will be necessary.

6. When the plan is developed it should be submitted to the public, and co-operation should be secured from the public authorities, thus enabling the full economic value of the program to be realized. In the establishment of new service, abandonment of unnecessary lines and the rearrangement of schedules, local opposition is inevitable. This can be overcome by application to the local difficulty of a general policy which is being pursued in the readjustment of the transportation system in the interest of the people as a whole. In meeting the problems of today and in planning for the future let us not forget that, although competitive, public service is essential, is salable, and that the extent of its development depends upon the planning, vision, confidence, courage, enthusiasm and effort of those responsible for its management.

MODERNIZATION to meet future needs requires not only improved facilities and methods, but must include the rejuvenation of management and men. The printed rule must be replaced with individual interest and initiative. Responsibility for results must be charged to each individual employee. Each patron is a potential competitor who can provide his own transportation.

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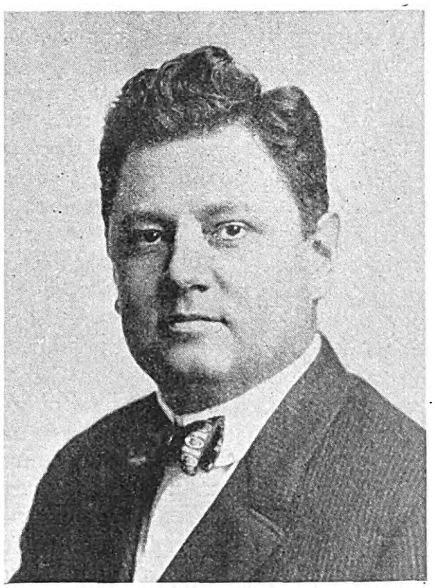
Old Bill Wise Presents:

Some Phases of the Electric Railway Situation From the Manufacturer's Viewpoint*

By E. F. Wickwire

Vice-President Ohio Brass Company, Mansfield, Ohio

IN MOST lines of industry the manufacturers' effort is pretty much confined to serving his customers in such a manner that they will feel disposed to continue to favor him with their business. If the business of the electric railways of the country should gradually slip away from them, it follows that the business of the manufacturers would dwindle in proportion.



E. F. Wickwire

The outstanding factor in the problem that confronts the electric railway industry today might perhaps be expressed in these words: "The car rider of yesterday is an automobile rider of today.

There are now enough autos in use to permit every man, woman and child to ride at the same time, and pretty soon all the cars will be able to get gas simultaneously, if they keep on building filling stations. At the rate we're going, it's only a question of a short time when every pedestrian will either have a motor car or wings.

One enterprising automobile concern has taken the lead in advertising the necessity of every family buying a servant's car—they're even trying to take the servant business away from us. This concern evidently knows the value of advertising to stimulate the sale of its product. It is well for us to keep in mind the fact that trying to do business with the public without advertising is like "winking at a girl in the dark. You know what you're doing but nobody else does."

It might not be a bad idea for us to "take a leaf" from some of the tobacco people and do some testimonial advertising. If they can convince the public by testimonials that mild cigarettes are good for the throat, perhaps similar testimonials from prominent street car patrons will convince the public that the modern street car gives a restful ride for ragged nerves.

While the situation perhaps does not tend to stimulate an optimistic view of the future, certainly it is not hopeless, and does not justify the pessimistic view taken by some people connected with the industry. Each and everyone of us must develop our individual backbones in order successfully to carry on the fight to convince the public that the electric car is the backbone of mass transportation. We hear a lot of talk these days about chiropractors, the fellows that knead your spine. I think that I need my spine myself and I think that every operating man and every manufacturer connected with the industry needs his spine. If we all stiffen our spines and unite in asking for what we should have, I believe the public will finally see the justice of our claims and grant them.

Electric railway operators are realizing more and more that selling is a tremendous factor in every line of business today—and the product that the electric railways are offering to the public must be sold to them.

The progressive merchant realizes that he cannot continue to do a successful business unless he appeals to the public's "spending instinct" by offering attractive merchandise. If he happens to get caught with some merchandise that is not quite up to the standard, he doesn't let that discourage him—he simply applies a little more ingenuity to his selling and advertising effort, like the Swede who built a salmon cannery in Alaska. When ready to commence operations he discovered that white meat salmon were the only fish available for canning on that river. So he pasted labels on his cans which read, "This salmon guaranteed not to turn pink in the can."

The average man who rides around in his 1929 model motor car is reluctant to transfer his "pampered anatomy" from the comfortable seat of his attractive looking automobile to an uncomfortable seat in a 1910 model trolley car. In fact, he feels a little "sheepish" about being seen riding in the latter. The automobile people are working all the time to make him dissatisfied with any means of transportation that is more than a few minutes old. The automobile owner trades in his old model for a new one, but there seems to be no market for second-hand trolley cars—unless we can succeed in disposing of some of them to collectors of early American antiques.

The electric railway industry has been criticized because of its slowness in creating and adopting new and improved equipment and better methods of merchandising. As Old Bill Wise might express it:

"I've driven this car," said the motorman, "by heck!
For twenty years and never had a wreck."
"You mean," said the motorist, as he backed up his 'Star,'
"You've driven that wreck and never had a car."

**Abstract of a paper presented at the annual convention of the American Electric Railway Association, Cleveland, Ohio, Sept. 22-28, 1928.*

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We see examples all around us of the fact that nowadays the public seems to take more kindly to "luxuries" than they do to "necessities"—and cheerfully pays more for them. Manufacturers of our principal competitor, the motor car—have sold their product to the public largely on this basis. And just consider what the manufacturers of ladies' wearing apparel have accomplished along that line. In the olden days it took three sheep to clothe a woman; nowadays, one good, ambitious silk worm can do it in an afternoon.

Many transportation companies are doing some very effective publicity work in the direction of pointing out the luxury of using street cars when they are really going somewhere and saving the automobile for rides where the cares of motoring don't blot out the pleasures. A great deal of good ammunition can be used to support this argument. For example, Old Bill Wise might start them thinking along the right line with something like this:

When tires blow out and gas is high
And you feel so low you could almost die,
The faithful old trolley gets you there
For the fractional cost of a tire repair.

A short, catchy card of this kind is more apt to appeal to the public's eye than a long-winded argument, which is usually just about as impressive as the Adam's Apple of a little neck clam.

The electric railway industry today is confronted with a hard struggle for existence even under the most favorable conditions. It needs every ounce of advantage that it can possibly obtain, not only in respect to adequate rates of fare, but relief from such things as taxation, paving expense and unjust damage claims. As Old Bill Wise says:

They paid their share when the old gray mare
Clattered o'er streets from park to square;
But today should trolleys pay pavement tax,
When they don't use nothin' but two little tracks?

Here is a sample of some good work that is being done by one railway company along this line. It is headed: "Suppose There Were No Street Cars?" and goes on to point out that "The motorist who has to stop behind a street car may at times feel that it would be better without trolleys on the streets. But if it were not for the modern street car, which carries so many people per square foot of city space, congestion would be so hopeless that progress through the streets would be impossible; downtown business stores and property would be but a memory," and the article closes with this line "The Street Car makes possible the use of your automobile."

The other day I saw a house being built to cost $5,000. Parked around it were $8,000 worth of automobiles which had brought the mechanics to work. Who paid for these motor cars, their operation and maintenance? I suppose it was saddled onto the poor fellow (and others like him) who is trying to save enough to pay for that home. Why don't these "self-appointed guardians" worry a little about that real burden which is loaded onto their "dear peepul?" But maybe they're just knocking our industry for political purposes. If so, we might treat them like a chap I saw the other day who drove up to a gas station and said, "Have you any of that gasoline that stops knocking?" The attendant said, "Yes." "Well," said the motorist, "give my wife a glassfull."

Perhaps some of the manufacturers do not realize how much they can help by continuing to co-operate with our committee in the proper use of the publicity material which we send to them from time to time. We must not forget that our own employees make up a substantial percentage of this "public." We can at least enlist the support of our own factory workers in our efforts to improve the industry and keep reminding them of the fact that they have a dollars and cents' interest in the welfare of the electric railways. With that thought in mind your committee is just asking our manufacturing company members to display a new "pay day poster," like the sample displayed here on the wall. With these posters we are sending each manufacturer a supply of "pay envelope stickers," printed in colors, the idea being that he will display these posters near the pay window and place a sticker on each pay envelope, carrying this appeal to our factory workers: "Filling the Electric Car Helps Fill Your Pay Envelope."

This tells the workman directly that he is interested in the prosperity of the trolleys, but sometimes it appears that it is only when the service is about to be taken away from him that the average citizen commences to appreciate the fact that the electric railway system in his community is a real benefit to him.

It seems to be up to us to find a way to demonstrate to the public the fact that they cannot expect the transportation companies to live on "red ink" and give "green plush" service, any more than they can feed a cow on sawdust and expect her to give shaving cream.

This applies even to people who are engaged in lines of business that are directly benefited by electric railway service. The manager of a large theater recently frankly stated to me that the loss of electric railway service in his community would be a decided blow to the amusement business. The business of the large department stores and various other lines would be seriously affected if there were no street cars. The first argument that a real estate man usually advances in trying to sell a piece of property is the fact that it is located on, or close to, an electric railway line. With these facts before us it does seem as though we ought to be able to enlist at least the moral support of those people who are engaged in lines of business that are directly benefited by electric railway service.

Ordinarily, these people are as indifferent to our troubles as the Scotchman who met a stranger stumbling through the wilderness around Loch Lomond. The stranger said, "I believe I'm lost. Can you help me?" The Scotchman asked, "Is there a reward for finding you?" When the stranger answered, "No," he said, "Well, then, you're still lost so far as I'm concerned."

In recent years electric railway operating men have had many cases where an effort to abandon service on lines which did not justify continued operation has been met by strenuous objection on the part of people living along the line. They kick even though they contribute nothing to the support of the trolley line. Like the Scotchman who wrote the editor that if any more Scotch stories appeared he'd quit borrowing the paper.

Old Bill Wise could appeal to such communities with this thought:

You never miss the sunshine
'Til it begins to rain.
You don't regret Welsh rarebit
Until it starts to pain.
The trolleys and their troubles
Don't worry you, but say!
It would double traffic trouble
Without trolleys here today.

So let's keep up our fighting spirit—and remember that "None but the brave deserve the fare."

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Greater Justice in Urban Transportation Rates*

By William M. Wherry, Jr.
Wherry & Wight, New York

Conditions have changed markedly since most rates for street railway service were established. Recognition of this, establishment of proper fares, and relief from unfair burdens is essential

DEVELOPMENT of urban transportation presents a most fascinating and graphic picture. If ever there was an example of the fact that there is no fixity in social life, but constant growth and development, sometimes gradual, sometimes by leaps and bounds, surely we find it in this industry. In the span of one lifetime, the horse car is superseded by the cable, and the cable by the electric trolley. In a single generation, the gasolene motor is invented and developed with its tremendous effect on all social habits. During the same period, the increase in credit facilities, increased production of gold and the cataclysmic World War unite to produce a revolutionary change in the purchasing power of the dollar. The very medium of exchange has completely altered.

Nothing could be more impressive than such changes, and nothing brings out so forcibly the truth that law, too, must change and cannot be static. The social contract conception of law has been largely superseded in our time. Our profoundest legal philosophers conceive of law as ever changing. A body of law adequate for the civilization of today could not meet the demands of the civilization of tomorrow. No statute, no contract, no precedent in law, is fixed for all time, but, when conditions change, a corresponding change in the law will occur in spite of everything.

We have this illustrated over and over again in the field of public utilities. In 1876 the Supreme Court of the United States upheld the power of the state to regulate rates and stated definitely: "For protection against abuse by legislatures, the people must resort to the polls, not to the courts." In 1920, or nearly 50 years later, that very court held unconstitutional a statute giving a commission power to fix rates because there was no provision for submission of its decision "to a judicial tribunal for determination on its own independent judgment as to both law and facts." In the meanwhile, there were hundreds of cases in which this development was slowly worked out. At the beginning of the period, the court not only said no judicial review was necessary, but enunciated the doctrine of despair that no judicial review was possible. At the end of the period, the court held a judicial review essential, not merely of the law, but of the facts.

One might think this settled the matter, but the rule, though applied to cases under the Fourteenth Amendment of the Constitution, has not yet been applied to those under the Fifth Amendment, and the principle is today still bitterly contested and in many jurisdictions absolutely ignored.

William M. Wherry, Jr.

From the proposition as to the ever-changing character of law and the necessity that it adapt itself to economic forces and social demands, there follow two things of great importance in the problem of rate-making for urban transportation. First, there is no reason to despair because we find undue legal restrictions on an industry. Our efforts should be unremitting to change such legal obstacles, and the precedents show that such efforts will be rewarded in time. It is necessary, however, that any such campaign should be prepared most carefully and most thoroughly worked out. The facts must be ascertained. The principles must be studied and developed. The campaign must be conducted along the lines these principles indicate and buttressed by facts properly presented. Often the street railroad industry has suffered from a supine acquiescence in some bad precedent as well as in a failure properly to prepare and present its cases.

The second corollary is that the contract or franchise with fixed terms is obsolete and was founded on a false legal conception. Every contract for public service to extend indefinitely in the future must be flexible and contain provisions for both modification and adaptation to changes of every kind. The essentials of such a contract

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are the continuity and development of the service and corresponding security of return to the capital necessary to be invested in the enterprise. Nothing could be more obvious during the past twenty years than the futility of efforts to fix either the standard of service requirements or the prices to be charged for service. The progress of the art has made obsolete methods and appliances for rendering service which were only a short while ago considered the very highest examples of the inventor's art.

The change almost overnight of the medium of exchange for measuring values made obsolete all previous fare arrangements. Yet there is something inherently attractive in the idea of a fixed contract. Stability seems so desirable, especially at the outset of any enterprise. At all times, there is an effort to define all the duties and obligations, all the rights and all the powers, of a public service company in fixed terms. The investor desires the certainty of definite assurances. The legislature is obsessed with the idea that once it passes a statute a thing is settled. These fixed contracts rose up to curse the industry at the time of its greatest need, just after the World War, when it was faced with intense competition and found itself bound by onerous provisions which took a long process to alter. Even today we find street railroads entering into contracts with municipalities in which an effort is made to fix a definite rate of return, a definite rate base and, in a modified form, commit the same mistakes that were committed in the short-sighted past. We find rate increases refused on the ground that stability of rates must be preserved at all costs, even to the sacrifice of service. In some states we still find constitutional and statutory provisions vesting in municipalities the power to make fixed contracts for fixed service on fixed terms, and ignoring the lessons of the past.

On the other hand, there are some striking examples of contracts made with flexible provisions, such as contracts for service-at-cost, where effort is made to adjust rates to changes—to fix a fare that will vary with costs. These contracts are based on a recognition of realities, but too many of them treat the present standard of value as if it were permanent, and attempt to peg or fix the investment, or part of it, for all time.

The idea, of course, toward which the whole public utility industry is working is the substitution of expert disinterested regulation for arbitrary and political interference.

Much progress has been made in freeing the management of all public service corporations from arbitrary restrictions, but the street railroad industry presents peculiarities not found in other branches of public utilities. To start with, nowhere else did we have the fetish of the 5-cent fare. Today, through bitter litigation throughout the entire country, the attempt to fix the fare and peg it at a definite unit has been gradually overcome. At the same time, the rule which has been established by the courts for the protection of the value of properties cannot be applied to the street railroad industry with the same success as to other public utilities. Under that rule, the utility should be entitled to charge the fair value of the service rendered so long as the aggregate net return does not exceed a fair return on the fair value of the property used and useful in rendering the service. This involves, of course, the determination of the value of the service. Here is the difficulty peculiar to the street railroad.

With other utilities, the value of the service is what it would cost today to reproduce it. With the street railroad this is not clearly demonstrable and in many instances obviously not true. The motor car and the taxi are competing factors so new that the question of how much can be charged and still attract the business requires the highest art of management. There are but few cases where a rate could be put into effect for a street car line high enough to produce a fair return on the fair value of the plant measured by the cost to reproduce it under present conditions. Prior to the war, the average rate of fare in the cities was less than 5 cents. Today it is somewhat more than 7½ cents, or an increase of about 50 per cent. This is a greater percentage of increase than in either gas, water or electricity, and yet the fare is not high enough to give the companies a net return which is anywhere near the net return secured by such utilities. Exactly what the value of the ride to the customer is, in view of the competition of the private car and other carriers, is not yet determined. But there is no question that the industry is entitled to a higher gross revenue and higher fares than even those at present secured.

In street railroad cases then, we have a situation not found in other public utilities. In fact, the street railroad is in the same position as the manufacturer or merchandiser who has competitive conditions to meet. It is not protected by its monopoly from competition with private cars or taxis. The principle, therefore, that management must be freed from arbitrary restrictions and that regulation must not usurp the functions of management, would demand that instead of an effort to peg fares at a fixed level, or to fix them in an arbitrary way, or to impose arbitrary regulations such as paving requirements, excessive taxes and the like, a greater freedom in all these respects must be accorded to the industry if it is successfully to perform its social function.

The courts have gone far in protecting street railroads from competition on their own routes by bus lines. The industry itself, through public service commissions and through its leaders, has gone far in combining and coordinating what would be competing carriers. Much remains still to be done along these lines; more comprehensive surveys should be undertaken and the results studied to devise the plan which ultimately must be followed.

In the field of the proper distribution of the rates, we find the street railroad behind other utilities. One is struck by the comparatively few attempts which have been made to classify fares. The car rider who thinks nothing of paying an increase in fare for each quarter of a mile ridden in a taxi expects to ride a few blocks or many miles for the same fare on a street car. Some efforts at zoning have been put in successful operation. Is it not possible that further development may be had along this line and that such efforts have been too readily abandoned?

The tendency today to classify street car riders as between transients and regulars is perhaps a more hopeful move. There we have a recognition that the regular customer takes a constant service and the transient a sudden or emergency service. This corresponds to the classification which has proved so successful in electricity and gas. A classification of fares based on this, namely, a cash fare to meet the needs of the transient rider and tickets or passes for the regular, undoubtedly is a move in the right direction. It gives promise of meeting one of the defects in past rate structures of street railroads, namely, the essential discrimination involved in a uniform fare. There is no question that a classification of street car customers which is not too complicated and which is

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made with reference to the particular conditions and demands of the community would result in increasing the use of the service in such a way that each car rider would more nearly pay his fair share of the cost.

In this connection, a suggestion has been made that the street car furnishes a special service to the community itself separate and apart from the car rider, a service to the taxpayer and the shopkeeper and the property owner, which is theirs whether or not they choose to ride on the street cars. There is undoubtedly a community need for avenues of transportation. The difficulty is to ascertain the cost of the service to the community as a whole. Whether the recognition of this service and the charge to the community for it is practicable is a debatable question.

This brings us to another burden. Neither franchise taxes nor paving requirements are ordinary or normal costs of furnishing transportation. The street railroad should not be made a tax collector for the community. It should not be compelled to go into the paving industry. Its business is to render service to the car riding public, not to the taxpayer and property owner. We have the community not merely not paying for service which it receives, but charging for a service which is not rendered to the car riders. Surely, even if it does not pay directly for the special service, it might well omit the special burden.

Paving assessments against a street railroad have been sustained as special taxes and also as an exercise of the police power. If so, it is hard to conceive a more arbitrary exercise of that power than these paving burdens have become today. What was legal in this respect many years ago, I cannot help feeling, has, under changed conditions, become illegal, and that the cases sustaining these burdens are no longer good law because they violate common sense and proper economic principles.

The principle violated is that a company should not be forced to render a service to those who do not pay the cost of that service, because the burden of defraying such cost must either fall on other customers or result in unpaid service—which is the essence of confiscation. This principle applies to services rendered to property owners as well as to car riders who do not pay their proportionate costs. In other branches of the public utility industry, the principle has been recognized and franchises or contracts imposing the obligation of free service for municipal water or lighting have been held void. This principle certainly should be extended to similar impositions on the street railroad industry. No one should be compelled to pay for a service which he does not receive, nor more for a service than its fair value.

Wherever there are public service commissions regulating the street railroad industry, and the industry has a chance to present its problems to such tribunal and to challenge the regulating orders made by these tribunals in court, there is no question of the progress of the industry and its protection from arbitrary restrictions and burdensome conditions. The danger is where the company is forced by contract to assume burdens which could not be imposed upon it by legislation. Perhaps the most serious question now confronting the entire public service field is how far a state or municipality can go in coercing a public utility into the surrender by contract of constitutional guarantees. The courts have held that a state cannot make a contract surrendering its rights that is binding on it. Is it not equally a violation of the fundamental principles of constitutional law to permit an individual to be forced to give up a constitutional right? There are cases which recognize this principle and, in meeting the many problems confronting the industry, these cases should not be lost sight of.

Great progress has been made in freeing the street railroad industry from the conception of the fixed contract and removing from it arbitrary restrictions. Obsolete contracts have been altered and abandoned. The principle of flexibility of regulation has been more and more recognized. Rates have been raised and higher unit revenues produced. To some extent, rates have been more equitably distributed. Competition has been met by restricting competitors and to a considerable extent by combining and co-ordinating supplementary services. Excessive special taxes, paving assessments, unremunerative extensions and other burdens not related to the actual function of providing urban transportation have been denounced as such and some progress made in their elimination. The changes have been tremendous in fifteen years in spite of the almost insuperable difficulty presented by starting out with a clearly wrong legal conception. It is along the same lines that more work must be done. Co-ordinated and persistent efforts will undoubtedly reap as great results in meeting the present and future problems as they have in the past.

Prosperity and the Automotive Industry*

By C. F. Kettering

Vice-President General Motors Corporation, Detroit, Mich.

IF THE automotive industry has gotten into public transportation it has not been our fault. It began when an automobile was first used instead of a livery to take people to an adjoining village. But the hauling of passengers from one town to another in automobiles wasn't very profitable, because they were too small, and we were asked to build cars with bigger bodies. The bus business started in that way. We went into the bus business with the experience which we had in building automobiles. There is still a great deal of development work to be done. The most encouraging thing that I have heard is that you believe that we have started something.

For a great many years I have represented the part of the industry known as research and development. Scientific research is not new to any of you, especially in the electrical line, but the principles of scientific research have not always been correctly represented. A research laboratory has sometimes been regarded as apart from the regular line of industry, as a curiosity shop or as something with a high-sounding title for the advertising men to talk about.

The facts of scientific research in the automobile business, when placed on a business basis, are simply that we

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want to keep everybody reasonably dissatisfied with what he has got. If we can do this, we are going to keep on making better automobiles.

Industry Must Advance with the Times

Every unit of time carries with it a unit of change. Research aims to find out the consistent rate of change of the thing studied and to provide the essential elements of the machine or the art that will meet the demands for changes as they occur. When you use the word "Modernization," you are simply saying that you have delayed the normal rate of change making and now are going to make it in a hurry. That is a very expensive way of doing it. The great problem of any industry is to keep its change-making consistent with the changing items. Consequently, if there is a certain normal rate of change, and the industry changes at the same time, the change is made at the lowest price wage possible. This is the only way in which anyone can economically operate a competitive business.

Our great job, after all, is not so much to make you dissatisfied with what you have as to present to you the changes a little while before you become conscious of their need. If we didn't make those changes a little in advance of your consciousness, you would be asking for them within a year or two. Our whole story is to be in advance of what you are going to ask for and have it ready for you just before you become conscious of the need.

That is why the average research man detests the word "Standardization," for the simple reason that every time you standardize a thing you establish a series of practices as of today and you don't want to change. In other words, the industry is always looking for a park bench where it can sit down and rest after it does a certain amount of work. The only place where there are empty park benches is immediately in front of the undertaker's office. If you want to sit down, there is always room there for you to do so.

Development Must Be Constant

In a changing world you cannot make any particular development and rest on its merits for any length of time. Why? The day you were born, everybody was older than you were. But, one year later in the United States, there were 2,500,000 people younger than you are, and in ten years, there are 25,000,000 people younger than you are. With the influx of 2,500,000 new people per year you have to change at the rate of 2½ per cent a year if you are going to stay in the picture. Who buys the automobiles in your family—you? You just pay for them. Your wife and the "kids" buy the automobiles. That's who buys them! In other words, it is this younger generation, this new item which you don't ordinarily take into consideration in business that is the controlling factor.

There is another important factor that we research men stand for. As soon as there is crystallization in any organization or in any civilization the point is reached where needs and wants are synonymous, but progress is made only when wants are greater than needs. You may think that when we develop a new automobile we depreciate those produced the previous year. We do nothing of the kind. Your old automobile is just as good today as if that new one had never been produced. If you want to keep on using it, it will give just the same service as it would have done if the new one hadn't been produced. The only thing we do is to appreciate your mind as to what you would like to have.

I can give you an illustration. I might take a $2,000 automobile and put it in a glass case on the premise that it shall not deteriorate in any way, and write the price, "$2,000," on the inside of the case. A year from now it is just as good as when it was put in the glass case. Will you pay $2,000 for it then? No, you would pay less for it, and in ten years you may not be willing to pay anything for it.

What happens? In ten years the price of that automobile has depreciated without a single factor having entered into it. That is why the automobile business has gone forward, because we have tried to meet the tempo of the peoples' demands for individual transportation.

Give the Customer What He Wants

The great thing that I want to get over to you is the fear of standardization. I am willing to be inconvenienced by a customer. If he wants cars upside down, he is going to have them upside down. Remember that you or I get no place in the world except in proportion as we serve the fellow who pays for our dinner. We are going to be servants as long as we live, and red or black servants, so far as the bank is concerned, in proportion as we meet the applause of the public. A black bank balance is popular applause for your existence. A red balance is the hiss of the community.

If you want to sell a new idea to anybody, you have to talk to him four years before he recognizes you have ever said anything to him. If you are going to change your rates or schedules, you must begin to tell it to the public five, six, seven and even ten years before you are going to get it. The education of a people to a change in thought is the most difficult thing in the world and, after all, that is the biggest thing research has to do—to teach people that this thing ought to be changed long enough before so that you get it changed at the time it ought to be changed, not five or ten years later.

I AM not opposed to government ownership because the government cannot do the job. I am opposed to it wholly because there is nothing but a political check on expenditure. And I think we have learned pretty well in this country, at least, that a political check on an economic situation is inadequate to protect the community. The only kind of check on an economic situation is an economic check. —Owen D. Young

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Bus Garage Design*

By H. M. Steward
Superintendent of Maintenance Boston Elevated Railway
Boston, Mass.

H. M. Steward

DURING the last five years there has been a rapid development with respect to the proper design for bus garages and a great deal of interest has been shown in this branch of the railway industry. It was realized that the problem with respect to housing buses differs from that with respect to housing trolley cars. A trolley car must necessarily operate along fixed lines on tracks, whereas bus operation is free and flexible. It is therefore desirable to design buildings to house buses which will allow for the freest movement of the vehicles. Experience has shown that modern garage design should provide for a building as nearly as possible in the shape of a square, with long spanned trussed roofs and with as few columns in the floor space as are necessary.

In determining the number of buses to be stored in any one garage, consideration must be given to the number of buses to be kept within any section inclosed by fire walls. This matter has always been considered in connection with carhouse design in order that the loss in equipment in the event of fire may not be too serious. At the present time, many of the state and city regulations limit the area of a garage section, if sprinklered, to 20,000 sq.ft. This area will permit storage of about 57 buses, which at, say, $10,000 per bus, represents an investment of $570,000 in buses alone.

Where possible, it is preferable to construct a building of one story only in order to provide natural light and to obtain suitable ventilation. Some of the earlier garage designs provided for buildings two and sometimes three stories in height and often with a basement. With such designs, considerable difficulty was experienced in providing natural light and proper ventilation. Buildings of more than one story also require columns which prevent the clear span which is particularly desirable. This is an important factor with respect to choosing the site. It is therefore advisable to select land outside of congested areas in order to have ample room for a one story building and adjacent yard which is desirable for proper operation.

The clear headroom depends on whether single or double-deck buses are to be used. For double-deck buses a clear height of approximately 15 ft. is sufficient and for single-deck buses not less than 12 ft. is desirable.

The floors should be of concrete finished with a hard wearing surface in order to resist wear when chains are used during the winter months and also to prevent dust. Garage floors present a serious problem with respect to providing a surface which will not absorb oil. Experiments should be made and information sought with respect to securing a material which will not only provide a hard wearing surface but will repel oil and grease.

Unless a very large number of buses are used in any one locality sufficient to warrant special machines or apparatus for washing purposes, the buses are usually washed on the garage floor, in which case the floor should be laid out in blocks of from 30 ft. to 40 ft. square, or similar dimensions, suitably sloped so that the water will be taken care of by means of standard floor drains having 4-in. outlets and provided with a large sand container.

Careful consideration should be given to the number and location of the entrance and exit doors to be provided. These factors will depend upon the size of the garage and its location with respect to adjacent street or streets. In addition to the doors used regularly for operation, consideration should be given with respect to emergency exits which would come into use in the event of fire. The doorways used for regular operation should be from 14 ft. to 18 ft. in width and at least 1 ft. higher than the highest bus to be operated. Doors of ample size will provide for quick entrance and exit and will avoid damage to both the doors and the buses.

Experience has shown that the ordinary swinging or sliding doors of wood, such as have been used successfully in carhouses and other buildings, are not suitable for garage use owing to their extreme size as the door gets out of shape in a short time, resulting in operating difficulties. It is therefore necessary to use doors constructed of all metal or metal and wood in combination. Doors which slide either horizontally or vertically are preferable to doors which swing, as they can be operated more quickly and are better suited to mechanical means of operation. With doors which are designed to slide horizontally, the best results will be obtained if the weight of the door is supported on large wheels running on a track in the floor, the top simply being guided, instead of following the old practice of hanging the doors at the top and guiding them at the bottom.

In garages of the latest design, it has been found advisable to provide some form of pit or runway construction upon which buses may be placed and work carried on underneath near the chassis. The runways can be constructed of steel, the space underneath the runways being opened continuously for the full width of the pit. Plenty of natural ventilation through shutters near the pit floor level and windows in the outside walls can be provided. Additional ventilation may be furnished by means of a duct carried across the head of the pits with a connection up through the roof to a ventilator.

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The number of pits required for a given number of buses has not yet been agreed upon. While formerly two or three pits were considered sufficient for 100 buses, today the tendency is toward a considerable increase. Some of the more recent garage designs provide for eight to ten pits for each 100 buses. One of the pits may be used solely for brake testing and one for oil servicing. It is probable, however, that this ratio (eight to ten pits per 100 buses) may be sufficient for ordinary purposes.

The length of the pit to be provided depends on the length of buses operated. No pit less than 24 ft. long should be provided and possibly the maximum length ought not to exceed 35 ft. It is probable that all of the work on the underside of the bus can be handled in a pit having a length of approximately 30 ft.

If it is decided to provide a garage with means for making full repairs to buses, the following requirements are necessary:

A well-equipped machine shop and motor testing room located conveniently to the pits, provided with a suitable telpher system with which to handle the engines and heavy parts; a stockroom; tire storage space; tire repairing space; blacksmith shop; a wood-working shop; a paint shop with suitable storage space; oil storage; oil reclaiming; upholstery room; a battery room; a room for ignition testing and other electrical work, and cleaning equipment consisting of a dipping tank with an agitator or one of the pressure systems using air and oil, steam or other cleansing compounds.

Means for fueling buses have, in many cases, been placed inside the garage and sometimes near the entrance and exit doors. This practice should not be followed as it increases the fire risk. When located near the doors, buses entering and leaving the garage are delayed. The best practice is to locate the apparatus for fueling outside in the yard, preferably with the gasoline pumps located on a raised concrete platform, so located that the greatest number of buses can stand to fill at the same time without interfering with the operation of buses entering or leaving the garage. In such cases, the pumps and other apparatus should be suitably protected from the weather by an overhead canopy.

Suitable oil equipment can be provided by purchasing any of the standard makes of storage systems, the size of which will depend upon the number and kinds of oil to be carried, as well as the capacity required. In large garages, where a considerable quantity of oil is used, it will be found economical to reclaim the oil by a simple distilling process.

The method to be provided for heating and ventilating a garage should be carefully considered. The heating requirements do not differ materially from that of any large building area and satisfactory means can be provided by the use of direct steam radiation or by unit type heaters placed either on the floor or hung from the ceiling.

In addition to providing ample natural light, ample lighting both for general illumination and by means of portable lights should be provided. Satisfactory results for general illumination have been obtained by providing lights hung directly from the bottom chord of the trusses, using 100-watt lamps with 18-in. white enamel reflectors, the lights being spaced approximately 16 by 16 ft.

Ample fire protection should be provided by means of a standard wet sprinkler system, supplemented by hand fire extinguishers, sand pails and, in addition, portable foam type fire extinguisher engines. At least one of the portable foam type engines should be provided for each 20,000 sq.ft. floor area.

Speeding Up the Track Construction Program*

By O. Williams

Superintendent of Way and Structures
Pittsburgh Railways, Pittsburgh, Pa.

Oscar Williams

NECESSITY for more efficient and more economic methods in the electric railway industry arose from the pressure of competition. Street railways have awakened from their period of inactivity and have begun the development of cars, power transmission, track construction and maintenance methods, and greater efficiency in all departments.

Several years ago it became necessary for the Pittsburgh Railways to begin an extensive track renewal program to produce this efficiency and to bring the tracks and paving to the standard demanded by present-day traffic. Since this program was expected to include the reconstruction of approximately 30 miles or more of single track per year it was deemed advisable to investigate and improve the methods used for track construction to speed work and reduce cost to a minimum.

Previous to the reorganization the system had six maintenance divisions, each under a supervisor of maintenance in charge of from 100 to 150 men. When new track was to be built on any division the supervisor was notified to increase his forces. This necessitated the hiring of untrained men and caused a loss of efficiency not only on the maintenance work, but also on the construction work itself. This method was unsatisfactory also because the supervisor had innumerable maintenance problems which diverted his attention from the construction work. Trouble was experienced with the foremen, who, while fairly efficient in taking care of minor repair

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jobs with a few men, were incapable of handling the larger forces of men. Very few labor-saving machines were available, another serious handicap.

After much study it was decided to separate new construction work completely from maintenance, and to form a new division. The new organization is headed by a superintendent of construction who reports directly to the superintendent of ways and structures. He has under him three general foremen who are capable of handling construction jobs of any size. Each general foreman has four foremen, each of whom is in charge of a crew of ten men under normal conditions. These crews are increased to sixteen men when construction work is at its peak. Each unit under a general foreman has its own equipment, an electric shovel, steel dump cars, eight-gun tamping outfits, concrete breakers, a roller, concrete mixer and other labor-saving devices.

A welder foreman with a crew for making all thermit welded joints reports directly to the superintendent of construction. A grinding foreman in charge of grinding all welded joints, a material man and a supervisor of methods also report directly to this superintendent. The duty of the material man is to see that all necessary materials go to each job as required. He also has charge of dispatching the crane car, rail car and other equipment used by the construction gangs. The supervisor of methods sees that each unit follows the same general plan laid down by the department head, makes arrangements for rerouting traffic, obtains special permits from municipal officials when necessary, acts as a general assistant to the superintendent of construction and supervises the trials of all new labor-saving equipment. With this organization no trouble has been experienced in building 30 or more miles of single track per year.

The procedure followed in most construction jobs is, in general, as follows: The night before the work is to begin, temporary T-rail crossovers are delivered by the crane car to the locations designated by the superintendent of construction or the supervisor of methods. They are placed approximately 1,000 ft. apart and are set the following day by the first crews of the construction unit. Overhead wires for the crossovers are put in and signal lights installed by the overhead lines division at the same time. As soon as the crossovers are set these men begin to take up the stone and excavate a small portion of the track in which the electric shovel will be placed that night. If the street under construction is one of the main thoroughfares and heavily traveled the grading is done at night, permitting work without interruption from the regular passenger cars.

When the excavation is complete ballast is delivered by motor trucks from local sand and gravel dealers with which the Pittsburgh Railways has contracted for this material. This is thoroughly rolled and the ties and rail are then delivered and placed. While this work is proceeding the electric shovel is finishing the grading to the next crossover. Rails are next spiked, tamped and lined, after which the welders make the thermit joints. By this time the shovel has completed its work and has probably started a job at a different location. The grading at the second location is usually finished by the time the welders have completed their work on the first job, so that crossovers may be moved and the shovel returned for the second stretch of digging without any delay. Thus, one construction unit is able to keep at least two and perhaps three jobs at different locations going at the same time. Proceeding this way, each gang of men becomes specialized in the work being done and consequently is able to perform it more efficiently. The use of temporary crossovers, electric shovels and air-tamping guns are the most effective producers of speed in the construction work.

Under the old system supplies for track construction were handled directly by the stores department; under the new system they are handled and delivered to a central point by the material man of the construction division. Ballast is no longer carried as stock material, except for the interurban division.

Work Scheduled During Construction Season

Another aid in speeding the construction program is the scheduling of all work to be done during the construction season. As 90 per cent of the track renewals are made at the same time the municipalities improve the streets on which the company has track, the scheduling of both the municipal work and the trackwork has become rather important.

In November of each year we submit to the city engineer a list of streets on which we have tracks in need of renewal the following year. This list includes approximately 50 per cent more track than we contemplate renewing. The city engineer checks the streets on the list to see which ones need repairing and then submits a revised list to the city council in February of the following year. The council usually approves the improvement of approximately two-thirds of the streets.

With the streets to be improved definitely determined we submit to the city engineer a tentative schedule showing the starting time and the number of days required for one track, together with the completion date. As the date for starting the second track will be determined by the date the city completes the paving of the first flank of the street, this is not decided upon until the tentative schedule is revised and approved by the city engineer. These revisions are generally made by the city engineer in conference with the superintendent of way and structures and the superintendent of construction.

Added to this list is another which comprises the improvements that are to be made by the other municipalities, the county or the state, upon streets on which we have tracks. These must be scheduled to fit into the city schedule and the plans of the municipalities. Some leeway is generally left in making the schedules to take care of any unforeseen work which may come up during the course of the year. The schedules are then given to the superintendent of construction and the engineering department, which immediately begins to make the necessary surveys, plans and drawings of special work needed on each job. Thus, the secondary engineering data and special work are available when the job is started.

At the time this construction system was put into effect there were six maintenance divisions with a total of approximately 600 men. This number has been reduced gradually until at the present time the maintenance is taken care of by three divisions with a total of 264 men. The three district supervisors in charge of the divisions are under the superintendent of maintenance. A new section was formed recently, the heavy maintenance section. It is under a separate supervisor and has a total of 48 men. This section takes care of all the heavy maintenance and installation of large special work jobs in any division on the system. Thus, total employees now in maintenance work number 312, compared with 600 men formerly, a reduction of approximately 50 per cent.

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Handling Supplies for Buses*

By W. S. Stackpole

General Storekeeper Public Service Coordinated Transport, Newark, N. J.

HANDLING supplies for buses and other automotive equipment does not differ in the essentials from handling supplies for electric railways, but there are enough marked differences between the two to warrant careful study and consideration by those who may have to operate stores of both groups of material. Among the principal differences are the following:

Greater emergency demand for materials; larger turnover; more rapid changes in types and models; greater obsolescence; special care required of certain materials; more safeguards for commonly used materials; more experienced class of stores employees; smaller differences between parts; more frequent deliveries to using departments; gasoline and lubricants; more defective material adjustments; care in stocking replacement parts, and tires and tubes.

There are so many kinds of materials required to keep a large fleet of various types of buses in operation that a company cannot afford to keep in its storerooms all parts and enough parts to meet all demands at once. Yet, the required parts and supplies have to be provided if the equipment is to be kept operating, and it becomes necessary to set up an emergency order system whereby an operating garage or shop may be enabled to secure the necessary materials from a nearby service station or dealer as quickly as possible and with the least amount of red tape. It may be that the company's storeroom has the certain required materials in stock, but the point where it is required is so far away that it is cheaper to secure it locally and at once than to spend the time and money required to go several miles for it. It may be asked why such items are not kept on hand at the operating points. Our garages do carry on hand materials for which there is known to be a constant demand, but with automotive equipment the unexpected frequently happens and it is impossible to foresee all items of materials that may be required in case of trouble.

In setting up an emergency order system it should be as simple as possible and able to function quickly. It should be controlled by an emergency order clerk in the main storeroom who is familiar with parts and who will know what is meant when he hears them called by several different names and descriptions or by various signs made with the hands. He should also be familiar with just where the required materials may be procured and to the best advantage, and to this end should consult and co-operate closely with the purchasing department. No emergency materials should be secured without a purchase order number, or without getting a delivery ticket from the vendor to be turned in to the main store as evidence of receipt of material.

In the automotive industry there is a continual change going on in the types and models of equipment, and this results in greater difficulty in maintaining an adequate stock of materials. It will most always be found that every lot of vehicles acquired are considerably different in many details of engine, chassis or body from the previous ones, resulting in a long list of new and additional supplies and parts to be added to the stock. Then, too, many changes and improvements are often made in existing equipment. All of these changes and additions require that the storekeeper watch his stock more closely than ever before.

There are certain kinds of automotive equipment and material that require special care in storing. Crankshafts and camshafts cannot be thrown into a bin or even neatly piled on shelves in the usual manner. They must be laid so that all points of bearing will rest on the shelf, for otherwise they will spring out of true and be rendered unfit for use. Radiator cores cannot be kept on hand for a very long time without deteriorating, due to the effect of solder and acid on the metal, and small ignition materials must be kept clean and dry. For this purpose small glass jars with metal tops are excellent. They also enable ready identification of parts.

In addition to storing materials properly it is necessary and advisable to keep some of them which are of common use under a separate lock and key. The Public Service Coordinated Transport keeps ignition, carburetor, generator, starter and vacuum tank parts, as well as lamps, spark plugs, tools and general automobile accessories, in a separately partitioned section under a special lock and key, with one designated man therein. This largely removes temptation from persons who may have access to other parts of the store. Some of the items are very small but quite expensive, and too good care cannot be taken of them.

There are a great many automotive parts on which the differences are slight and not noticeable, or seemingly unimportant. Among such materials are wristpins and bushings, pistons, piston rings, valves, bolts, nuts, bearings, ignition parts, carburetor parts, etc. To assist the stock clerk in detecting differences of materials that vary slightly, so they may be checked and shelved correctly, it is necessary to supply him with gages, micrometers, catalogs, blueprints and samples of certain materials.

In street railway operation the replacement of defective parts is not ordinarily a large or troublesome item. With automotive parts, however, there is considerable replacement and it is necessary to provide a system to handle such matters expeditiously and without loss. Full data as to mileage, service, age, replacement order numbers, etc., are required by the vendors and manufacturers before allowing credits for defective materials and arrangements should be made to have these data furnished on all such material sent in to the storeroom from operating points and shops.

In organizing the bus stores department it is not wise to have a separate store for all bus supplies unless it is necessary on account of location. Rather, it will be to the advantage of all concerned, including stores department employees, to handle all purely automotive supplies in one section in or adjoining the railway store, and then storing materials that are used alike for railway and bus operation together. It will be found to be more economical to follow this plan, both as to cost of stores operation and the amount of money invested in materials and supplies. In other words, co-ordinate the supplies as much as possible.

*Abstract of a paper presented at the annual convention of the American Electric Railway Engineering Association, Cleveland, Ohio, Sept. 22-28, 1928.

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What Is a Fair Measure of the Cost of Handling Materials and Supplies?*

By C. A. Harris

Chief of Stores the Philadelphia Company and Affiliated Corporations, Pittsburgh, Pa.

THIS subject, part of a study assigned to special committee No. 3 of the Purchases and Stores Division of the A.E.R.E.A., has been a much mooted question because while the method which is most logical in arriving at the cost of handling materials and supplies is uniformly accepted, it is not possible to use it as a comparison to measure the efficiency of the stores departments between companies, since there is a lack of accordance in the principles and practices which are the fundamentals of assembling these cost figures.

There are five ways of measuring the competency of the stores department, none of which by themselves are of much value. They have to be synchronized to produce an entity which shows the trend toward improved service. They are as follows: Cost of operation, stock shortages, percentage of turnover—low inventories, good housekeeping and harmony and good-will among employees.

While the first one mentioned is predicated on the other four, the second is the one of greatest importance.

On the properties controlled by the Philadelphia Company there is taken into consideration the actual labor and salary charges to Stores Expenses not only of the stores department itself, but a fair proportion of charges incidental to stores incurred by the purchasing and accounting departments on a set basis according to the earnings of the various underlying companies which benefit from the functions of such general departments. To this are added incidental expenses such as repairs and maintenance of stores equipment, stationery used within the department, light, heat, power, etc. Against this sum of total and actual expenses we consider the value of actual disbursements, not including transfers between stores, nor credits for returned or reclaimed materials, nor the value of purchases. The ratio between the two factors gives the cost of operating the department.

It is believed that the figure so obtained gives one angle of measuring the performance of the department. It varies with the load factor of business done but it does not indicate the true measure of service given, although it reflects in a way the volume of activity. It is a factor which in the manufacturing business forms part of the overhead and enhances the intrinsic value of commodities handled, being added to manufacturing cost in determining unit prices.

Such a plan is the most equitable way to arrive at construction and other costs rather than through the apportioning of such expenses so intimately connected with material costs on a percentage or fixed basis at the end of the fiscal year. It is agreed that freight should be added to the unit cost of materials. Why not the entire cost of the handling and delivery to jobs?

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C. A. Harris

According to the proper definition, price means an equivalent given in exchange. Irrespective of how the cost of handling materials is allocated to departmental operation it is a price charged by the stores department for which the latter should give an equivalent in return, and that is service. A low figure denoting cost of stores operation is no proof of adequate service. An undermanned storeroom is very expensive to the departments served and inversely all the necessary personnel is of no use to customers if the stock is insufficient.

The A.E.R.E.A. has incorporated in its Manual an efficient method of stock control by the use of stock books which necessitates a monthly inventory. It is not the only means of achieving the desired result but it is one which several companies have found more effective than other systems and, incidentally, it is the basis of stock control on most of the steam road systems.

It has been said that stock refusals, like the poor, we will have always with us—but surely they can be kept to the minimum. One answer is the closest touch with the users of materials, who have just as much responsibility in making their wants known to the supplying department as the latter has in taking prompt care of those needs. Another answer is an equally close co-operation with the purchasing department. However, no matter what scheme is plotted on paper it is worthless unless everyone in the stores department realizes his responsibility to keep up the stock so that the using departments are not unduly inconvenienced by not obtaining what they want. The efficiency of the stores department from an operating point of view can be judged only by the service it renders.

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It is just as disastrous not to have enough materials available as it is to have surplus stocks. A fair measure of this phase of stores work is the percentage of turnover, which may be arrived at by dividing the value of materials on hand at the end of the month into the value of materials disbursed during that month. These figures may be readily converted to show the number of days stock on hand by again dividing it into the number of working days in the year. Such a comparison over a period of months by years gives an excellent guide to show the trend of stock movement, particularly if the stock is classified according to the material classification which forms part of the association's Manual.

In the same measure that the stock refusals are a gage of efficiency from an operating point of view, so is the ratio of material turnover a like criterion from the angle of investment in unapplied materials.

It is difficult to make comparisons on this basis with other companies because of different policies at times predicated on financial status, prejudices, unwillingness to part with dearly beloved "old stuff," and a lack of definite organization, such as standards or obsolescence committees, etc.

A curve of such figures over stated periods shows the need of reviewing the stock for obsolete items. It gives the storekeeper his cue to gird his loins and battle with the department head for decision.

Indirectly such an effort makes it possible to reduce inventories to a normal level if such a thing is possible. Here again mere figures for the sake of comparison mean nothing. A low inventory from a storekeeper's point of view may be desirable, but it may be the means of rendering the poorest kind of service to the operating departments. There is a happy medium which should be strived for.

Good Housekeeping

Materials represent assets and should be so taken care of. After all, good housekeeping is the simplest and easiest way to reduce expenses. As a rule the majority of people prefer orderliness and only through negligent or inefficient supervison will they lose interest in neat work. It cannot be hoped to operate storerooms without cleanliness and care. Fortunately it is never too late to mend the lack of good housekeeping; it is the easiest thing to remedy. Its advantages are obvious not merely because of appearances but because of facility of handling materials and supplies.

Harmony and Good-Will Among Employees

An executive may have the best plans in the world to conduct his department, but if he does not possess the good-will of his employees, his work will not bear fruit. By the same token, to achieve the desired result he must imbue his men with the idea of intra-departmental co-operation. Harmony means in a true sense agreement in relations as well as in action. We pay a great deal of attention to cranes, tractors and other labor-saving devices and incidentally we pay a great deal for them. They are a necessary adjunct to a well equipped stores department, because they are a means of reducing handling costs and help us to give better service. We must not think any less of our employees and select them with as much care as our machinery. Good-will with and among employees is of paramount importance.

In the foregoing are five of the more significant ways by which to measure the efficiency of the stores department, bearing on the various operating functions in the manner that cost of operation is a guide for the stores department; stock shortages are a guide for the operating department; percentage of turnover is a guide from the viewpoint of investment; good housekeeping is a guide for material conservation and harmony is a means of achieving these results.

The Philadelphia Company and Affiliated Corporations have done pioneering work along the lines of improved stores service and are using the ideas advocated in this discussion. These companies are on the alert to improve the service and reduce expenses without impairing the latter.

Such, after all, is the duty of the storekeeper. Only in this manner will he foster the confidence, so indispensable to a department, which should be first and last that of true and unselfish service.

Inspection*

By Dwight L. Smith
Electrical Engineer Chicago Rapid Transit Company

Dwight L. Smith

PRACTICAL lives of some of the items of electrical construction on our property have been found to be: Third rails, thirty years; overhead feeders, twenty years; telephone cable, ten years; station wiring, twenty years.

These figures are offered not as ideals, but as figures actually found in past practice and to indicate the transitory character of what we regard as permanent construction.

In any complete construction, some parts of items may wear out and deteriorate faster than other parts. At some time during the life this deterioration reaches a point where a failure is liable to occur. Neglect in making repair or replacement of these weak links invites failures. Repair or replacement at the proper time not

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only prevents failures but extends the life of the complete installation.

There is only one means of determining actual condition and that means is inspection. The mechanical man has for years inspected and repaired his equipment on some regular basis of time, car-miles or kilowatt-hours. The fact that the mechanical equipment was in motion seemed to demand such care.

How does one get intelligent inspection? First, carefully select the right men for the work. Not every man has the qualities to make a good inspector, and the fact that he is a good mechanic or a good workman is no criterion. A good inspector requires not only the perception to detect existing faults but vision to see the possibility of future ones.

Intelligent, easily understandable and complete written instructions for inspection are necessary. General questions such as "Is this installation safe and in good condition?" will not suffice, for they leave the answer to the judgment of the inspector.

The questions are extremely detailed ones about the condition of each and every part of each class of construction. They ask, "Are there three secure lags in insulator?", "Does pothead show signs of cracks?", "Is crossarm in good shape and sound?", "Is pressure of finger tip 16 pounds?". The question suggests the action to be taken if the answer is negative. Follow the question with a statement of the necessary action, "Are there three secure legs in insulator"—"If not, screw in present lags, replace with new lags or install necessary additional lags."

The proper men carefully schooled and coached in inspection quickly acquire the spirit and assume such decided responsibility in the matter that it is sometimes a problem how to hold down their enthusiasm for extensive work which is desirable, but which financial conditions may not permit.

The necessary frequency of inspection depends on several factors:

1. Class of work and expected liability to acquire defects.
2. Location—
   (a) As regards density of traffic.
   As regards seriousness of delays due to defects.
3. Original condition.
4. Age of installation and consequent condition.

Of these factors the first two are the most important and their relative importance depends upon the class of property. Such items as third rail and trolley wire wear in almost direct proportion to the density of traffic.

Written reports are made of all inspections, signed by the inspectors under a certificate reading:

We certify that this property has been thoroughly inspected in accordance with instructions for inspection and that:
1. All serious defects found were repaired and put in safe operating condition immediately.
2. All other defects found were repaired this day or will be repaired on the next working day.
3. All major defects have been reported to the foreman for work on them under his orders.

Throughout all our work we endeavor to instill into every man the idea that with proper maintenance there should be no such thing as trouble. Our men are not trouble men but maintainers, and it is their function to take such care of the property for which they are responsible that trouble will never occur.

As power and distribution men we realize that our part of electric railroading is only a means to the end of carrying passengers. Nothing that we do produces dividends in itself, but a careful inspection and maintenance program which eliminates service interruptions will be the means of preventing a loss of dividends.

Automatic Substations
Successful in Cincinnati*

By Harley L. Swift
Superintendent of Substations Cincinnati Street Railway, Cincinnati, Ohio

H. L. Swift

IN 1927 the Cincinnati Street Railway found its Pendleton plant in need of repairs, and its old system of distribution obsolete. It had besides the power plant 12 substations with a total capacity of 30,700 kw., 12,000 kw. of which were concentrated in two stations in the down town area. Four of the stations were 25-cycle, seven were 60-cycle and one was a combination 25- and 60-cycle.

A careful study of costs was made and a twenty-year contract entered into with the Union Gas & Electric Company for the purchase of all power at 13,200 volts 60-cycle, and the sale of the Pendleton plant.

The power distribution system was revamped, resulting in 19 full automatic stations with a total capacity of 29,200 kw., located approximately 1 mile apart. A complete system of central supervisory control was superimposed on every station.

For ease of maintenance the inside of the stations were made alike. Twelve new buildings were built and 5 remodeled. Particular attention was paid to ventilation and the recommendations on substation ventilation of the Power Generation and Conversion Committee of the A.E.R.E.A. were followed. All machines in residence districts were mounted on 3 in. of cork construction with hollow tile walls, with no openings above the floor line, and high ceilings were other methods used to eliminate noise.

Deceleco structures were decided upon in preference to concrete, brick or steel high tension structures because of their low cost and ease of erection. Deceleco is a

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fibrous gypsum compound with practically the same strength as concrete and almost as workable as wood.

The Union Gas & Electric Company brings and maintains all incoming high tension cable to the pothead in the cell structure, space being provided in the structure for their metering equipment, transformers, fuses, etc.

Incoming power lines and outgoing feeder lines were brought into and out of the buildings underground from the curb line, the former through ducts and the latter through a tunnel and then up to the overhead lines through pipes and potheads on either side of the trolley pole.

The following give data on the new buildings:

Average cubic foot per kilowatt	27.8
Average square foot per kilowatt	1.18
Average building cost per kilowatt	15.60
Average cost per kilowatt	44.25
Square foot of ventilator per kilowatt	0.092
Square foot of air inlet per kilowatt	0.101
Average number days from breaking ground to placing in service	170.9
Average number of men employed per station on installation	15.0
Cost per kilowatt purchased, cents	0.82
Cost per kilowatt manufactured power, cents	1.13

It is expected to maintain and operate the system with 15 men at an annual saving of about $8,500 in labor over the maintenance and operation of the twelve old stations. The saving in power is estimated to be about $40,000 per year.

Nearly 43 miles of lead covered telephone cable, ranging in size from five to twenty-five pair, suspended from $\frac{5}{16}$-in., 6,400-lb. copper-weld messenger, fastened to the trolley poles with Hubbard clamps, were required for the supervisory cable.

The Bolted Rail Joint in Paved Track*

By B. P. Legaré

Engineer Maintenance of Way and Construction
Market Street Railway Company,
San Francisco, Cal.

IN 1911 the Market Street Railway adopted the bolted joint as its standard in all new construction. The type of track consists of rock ballast, redwood ties, Lorain sections 106-422 and 121-519.

This standard joint has two Lorain Bridge type splice bars for 9-in. rail. These are held in place by twelve 1-in. ordinary steel bolts. All joints are installed by the same crew, which consists of a foreman and three or four laborers.

Before attaching the plates the rails are butted together as close as possible by the construction crew (generally in the early morning when it is comparatively cool), the plates are attached and two bolts installed to hold the rails in place. After this part of the work is ready the special small gang takes off the temporary plates, bonds the joints with brazed concealed bonds and bolts them with the twelve bolts, six being inserted from one side of the rail and six from the other side. In tightening

B. P. Legaré

them, sledge hammers are used on the heads of the bolts and on the plates to drive the plates in, making a perfect fit. In this way if there is a slight inequality in the fishing section of the rail the plate is swaged in to fit the inequality. The bolts are then tightened again and the process repeated until the joint is apparently completed for operation. Cars are permitted then to run over the new joints for a few days after the first installation, after which the joint gang goes over the joints, while still under traffic, with wrenches and tightens up any looseness caused by the cars. This is done several times, the last time being just before the track is paved.

The head of the rail at the joint is then planed to make a smooth, even-running surface. If not planed, no matter how slight a difference there is, the rail will cup after a period of service; but when planed to a bright surface on both sides of the connection there is little chance of cupping.

Since adopting this standard joint seventeen years ago, there have been less than one-half of 1 per cent failures, all of which were caused by breaks in the rail ends, generally by cracks through the line of bolt holes. Occasionally we find the head of the rail split from the web which may have been caused by cracks present before using and so fine that they could not be discovered but developed after years of service by the pressure of the tightened bolts together with the action of the heavy cars. Where the cracks are in line with the bolt holes it is probable that several conditions combined are responsible. First there may be small checks caused from strains in the rolling and punching of the rail ends which are not detected. Then the brazing process for bonds heats the web to a white heat which in cooling may develop strains and checks. It is certain that this heating of the web at a local spot between the bolt holes with comparatively cool metal all around it cannot help but injure the rail ends. These causes, together with the strain put on the head and bottom flange of the rail by tightening the plate, are responsible, in my opinion, for such breakages.

In all we have installed approximately 22,000 joints of which 75 have been repaired. Of these 75 we have a record of only one where the bolts became loose; the others were all broken rails. We find that even the broken rail joint rarely develops under ten years service.

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Year's Work Reviewed

by Chairmen of American Committees

Reports presented on street traffic economics, rapid transit, insurance, motor vehicle information, industrial relations and education

ON SATURDAY morning, Sept. 22, the executive committee of the American Association held an open meeting in the new ballroom of the Public Auditorium. President R. P. Stevens presided. The principal business transacted was a review of the year's work, particularly as it was presented in the reports of the various committees. Following the usual custom these reports were not read but only discussed briefly by the chairmen. Abstracts of the reports of the committees on street traffic economics, rapid transit, insurance, motor vehicle information, publications, industrial relations and education are given below. The report of the committee on employee-customer contact will appear in a future issue. No formal reports were presented by the committees on finance, subjects and meetings, publicity, national relations, membership, co-operation with motor vehicle industry, electric railway finance, motor bus depreciation, public speaking or taxation.

Street Traffic Economics

THIS year the committee on street traffic economics is submitting merely a progress report which gives some sample data in chart form indicating many of the lines of study of street traffic economics and which gives in appendix form a review of opinion on various phases of the subject. There has been no attempt made to reach conclusions or to establish principles. The most important purpose to be served by this year's report is to stimulate interest in the lines of investigation suggested, as well as interest in formulating the complete program of approach to this intricate problem. It is hoped that the members of the committee and other interested organizations may be able to develop similar data covering other cities and locations, so that later reports will have more complete basic data from which to develop authoritative conclusions or to establish sound basic principles underlying city development and adequate methods of caring for the traffic and transportation problems.

For the first year's program it was considered desirable to limit the investigation to a few subjects and to get sample data which would illustrate to advantage the kind of information that would be applicable in the study of the problems. Then, standardized methods of investigation might be developed which would permit traffic analyses to be made in all cities, so they would be suitable for comparison. With such data at hand later authentic statements of principles can be developed.

The committee adopted for the first year's consideration the following topics:

1. Discussion of reasons why people concentrate in cities and why there is concentration in central areas of cities.
2. Interpretation of the purpose of streets as public thoroughfares.
3. Legal history of the rights to use streets.
4. Present use of streets in various types of cities: (a) Service in maximum hours showing numbers and types of existing traffic, pedestrians included; (b) measure of the relative use of streets in each hour of the 24; (c) measure of the wastage of street use.
5. Principles of betterment of use of streets: This to be later subdivided into several items.
6. Betterments in actual practice.

Part of this has been covered. For the first three items the discussion is given in the appendix where quotations of opinion have been compiled. These quotations are the most competent statements available on the various topics.

The report is signed by J. H. M. Andrews, F. L. Annable, John A. Beeler, J. Rowland Bibbins, M. R. Boylan, Edward Dana, S. E. Emmons, E. P. Goodrich, R. F. Kelker, Jr., Miller McClintock, E. J. McIlraith, L. H. Palmer, C. E. Smith and G. A. Richardson, chairman.

Industrial Relations

THE committee believes industrial relations is concerned with five major items, namely, employment of suitable employees, education and training of employees, health of employees, thrift of employees and employee representation.

A greater number of suitable men will be attracted as applicants for transportation positions if there is a greater realization in a company of the regularity of transportation employment, the total annual wages received, and the general benefits under which employees work.

It is evident from the data submitted by the committee that the education and training of employees has had no extraordinary development. There is need for greater study, and particularly to differentiate between general education of the employee and the training for his particular job. One of the telephone companies recently issued a statement that two years ago it found, by observation, that 80 per cent of the transactions between its operators and the public resulted in some dissatisfaction to the customer. By noting the items of dissatisfaction and treating them generally with all employees, it has been able to reduce dissatisfaction to a point where observations indicate that only 15 per cent of the transactions create some unpleasant contact. The committee finds that there is a trend toward specific instruction, and believes that greater effort should be given to analysis of the job, particularly of platform employees, whereby specifications for specific instruction may be prepared.

It is found that the healthy employee is being given greater attention than in prior years. Initial physical examination is common, and companies reporting to the committee show that the physical examination of applicants eliminates many undesirables, as some companies have found that much illness of employees results from poor teeth, and they have adopted much more rigid dental requirements at the time of initial examination.

Opinions vary as to the extent of activities to create healthful environments. The committee finds, however, that many companies have benefit plans whereby the employee is compensated a fixed amount per week when he is off duty on account of sickness or accident. There is a trend also to create the most healthful environments as the same apply to good working conditions.

Many thrift projects are in vogue among companies reporting to the committee. Many studies are under way of employees' stock ownership, plans for saving, and organization of building and loan projects. In some cases these have been promoted through employees' benefit associations.

Appended to this report is the outline

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as submitted to several companies so arranged as to show comments of these companies beside subdivisions of the outline.

The report was signed by James P. Barnes, S. B. Way, W. E. Wood, Thomas Fitzgerald, vice-chairman, and Joseph H. Alexander, chairman.

Motor Vehicle Information

IT HAS been the purpose of the committee to enlarge upon the report of 1927 by giving more specific information and by the addition of certain questions which were not included in the questionnaire for last year. No attempt was made to circulate the questionnaire among all railway companies operating buses, but rather to confine it to the eighteen members of the committee in the belief that their replies will be representative of the industry as a whole. The idea has been to obtain general rather than detailed information.

The general opinion indicates that there will be a continuation of purchases of buses by electric railways during 1928, but probably not to such a great extent as in 1927. Most of the new buses, particularly in the large cities, will be used for feeder and cross-town service, but in the smaller cities there will be some replacement of car lines by bus operations. In some cases tracks and paving renewals required by the city government have led the companies to replace street cars with motor coaches. In most cities bus service operated by other than electric railways has been reduced or eliminated, but interurban operation by other companies is still on the increase. Bus operation is not yet yielding a fair return on the investment, if considered purely from the standpoint of net income. If, however, it is considered from the standpoint of savings over cost of street car operation in similar districts, its operation is amply justified from the investment standpoint. The trend is toward larger and more luxurious coaches for interurban operation and higher powered and better coaches for city operation. The hauling of freight by motor trucks is on the increase. Opinion is divided with regard to the future of bus operation. In some sections there is a belief that there will not be very great development in the bus field, but replies from the majority of districts indicate that bus operation will be on the increase for some time.

Regarding types of equipment, the overwhelming opinion for all classes of railway service is to the effect that the single-deck street car type bus is the best. Most of the reporting companies feel that in the development of the bus as a means of mass transportation, it would be a mistake to adopt rigid standardization of equipment, for the reason that it would prevent beneficial experimentation and throttle initiative.

Speaking from the standpoint of economics, local conditions dictate the points at which bus service should be replaced by car service. The determining factor is the difference in cost between selling and operating street car service and the cost of operating a bus service. It is the common opinion that buses should not be replaced by street cars until the loads carried by the buses in the base hours are sufficiently heavy to warrant a fair headway on street cars. Reporting companies are about evenly divided on the question as to whether the street cars or buses are most popular with the public. Answering the question as to whether the 10-cent fare is too low to be adopted as a standard for bus operation, the opinion of the reporting companies is about evenly divided. One operator has suggested that the idea of the standardization of a dime bus fare is dangerous, and that the same situation that arose with the "nickel logic" on street cars should be anticipated and avoided.

The report was signed by M. R. Boylan, L. C. Bradley, F. G. Buffe, F. L. Butler, F. A. Cummings, B. J. Fallon, H. B. Flowers, M. B. Lambert, R. L. Lindsey, W. H. Lines, H. B. Potter, R. I. Todd, W. B. Tuttle, E. P. Waller, S. B. Way, W. E. Wood, D. W. Pontius, vice-chairman, and J. H. Alexander, chairman.

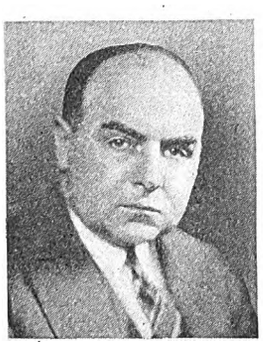
Education

DURING the past year the committee on education has concentrated largely on the following topics: (1) Course for training conference leaders in the transportation department; (2) course for training transportation leaders in the non-transportation departments; (3) educational luncheon conference; (4) conferences of personnel and educational directors; (5) training transportation employees already in service, including dramatization demonstration; (6) educational exhibit for the 1928 convention. The sub-committees handling these topics presented reports which are abstracted in appendixes. In connection with the training of present transportation employees the following recommendations are made:

1. The preparation of a key manual for use of the executive in charge of the training work. This manual to contain proposed procedures and methods as outlined together with a list of the indicative subjects.
2. The preparation of a series of manuals treating the foregoing subjects in a universal method as a preliminary step for use with either keymen or operating employees.
3. That more complete and detailed material on various subjects be prepared in the nature of a textbook that could be distributed (for a small fee by the association) to form the basis of class study on those properties so desiring.

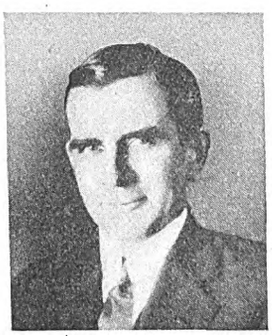
In another appendix is given a bibliography of recent articles, pamphlets and books on employee education and training.

The report was signed by L. P. Baurhenn, A. C. Blinn, W. H. Burke, J. A. Dewhurst, H. H. Fenton, M. B. Lambert, M. McCants, F. H. Miller, H. B. Potter, A. J. Rowland, A. J. Sarré, C. D. Smith, H. H. Norris, secretary; J. S. Hyatt, vice-chairman, and Edward Dana, chairman.



T. A. Kenney
Finance

F. R. Coates
Subjects and Meetings



Paul Shoup
Publicity

J. H. Hanna
National Relations

Dr. Thomas Conway, Jr.
National Relations Sub-Committee on Depreciation

Rapid Transit

INSTRUCTIONS to the committee this year were that it should review the reports of previous years and revise the information so it could be compiled in a single booklet.

The data included are illustrative only and do not attempt to present complete factual information such as would be developed in the making of an analysis of the possibilities of rapid transit in a specific location. The report points out that the use of transit thoroughfares at other than surface level is becoming necessary not alone from the advantage in creating rapid transit, but also in order to provide additional street space

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C. E. Morgan
Membership

E. F. Wickwire
Publicity

Lucius S. Storrs
Co-operation with Motor Vehicle Industry

William A. Jackson
Taxation

J. H. Alexander
Motor Vehicles

without widening the streets in areas where the land values and existing structures practically prohibit street widening. Better results, improved transportation and improved vehicular flow come from separating the three classes of traffic as much as possible. The ultimate plan that can be readily accomplished gives principally to vehicles the present level, creates a new sub-surface level to give the electric cars and trains an uninterrupted right-of-way and provides an intermediate level for pedestrians only.

In certain sections of the city the subway construction would be logically changed to the less expensive elevated road of the most modern type, operating either along private right-of-way or along the line of the alleys, so as to make a minimum disturbance to property values and to street utility and appearance. The costs of such developments are not prohibitive if the program is appropriately planned, suitable to the city and to the transportation and traffic needs.

The physical layout of all our large cities is quite inadequate to meet the modern needs of traffic and transportation in large cities unless new levels are utilized in the existing streets. The problem has, then, become one of immediate and urgent concern for city governments and for the business interests of the larger cities. The opinion is now very widely held by public officials and transportation organizations that it is impossible to produce adequate transportation in a city using rapid transit structures without spreading the cost equitably over all those who are obtaining benefits.

The report is introduced by a summary of the economics of rapid transit prepared by Leslie Vickers, economist of the American Electric Railway Association, and contains an invaluable compilation of statistical data, estimates of relative unit construction costs of various forms of transit facilities, and comparisons of the carrying capacity of streets and rapid transit structures. It also contains extracts from many reports, opinions of prominent transit authorities and public officials, bearing particularly upon the question of the equitable distribution of rapid transit construction cost among the several benefited groups in the community.

An unusual array of transportation executives and authorities on rapid transit matters made up the membership of this committee.

The report was signed by the following: H. L. Andrews, W. B. Bennett, Edward Dana, H. E. Ehlers, S. E. Emmons, B. J. Fallon, Thomas Fitzgerald, E. J. McIlraith, R. F. Kelker, Jr., W. S. Menden, D. W. Pontius, C. E. Smith, F. H. Shepard, J. B. Stewart, Jr., D. L. Turner, James Walker, J. H. Alexander, vice-chairman, and G. A. Richardson, chairman.

Insurance

FROM data compiled from questionnaires sent out to member companies the committee on insurance was able to report that the industry has had another year of small losses in comparison with the amount of property insured and the premiums paid. Its efforts to prevent fires, to eliminate its hazards, and to continue to deserve new rates have been sustained throughout the year. The questionnaire on which the insurance data was reported in 1928 was sent to more than 600 companies. The number of complete replies received is 325, as compared with 339 complete replies received last year. These 325 companies operate 64.98 per cent of the total trackage of the United States. The number of cars covered by the insurance is 53,681, approximately 70.29 per cent of all electric railway cars in use. The total amount of fire insurance carried by the 325 companies reporting this year was $694,833,900.

Motor bus fire insurance was reported by 140 companies, carrying a total of $19,962,850. The number of buses insured in 1927 was 4,745, which was 63 per cent of the total number of buses operated by electric railways that year. Public liability insurance of buses was reported by 79 companies for 1927, and property damage insurance by 68 companies. Other types of bus insurance, such as excess liability insurance, theft,

TABLE II—PROPERTY DAMAGE INSURANCE

	1927	1926
Number companies carrying property damage coverage	68	52
Number buses covered	991	684
Total amount insurance reported	$1,920,500 (55 cos.)	$1,060,500 (re cos.)
Total premium reported	46,354 (47 cos.)	33,187 (34 cos.)
Insurance carried by companies reporting premium	1,343,500	855,500
Rate per $100	3.45	3.88
Amount of losses	2,903	1,972
Amount recovered	1,576	1,969
Ratio—amount recovered to losses, per cent	54.32	99.84
Ratio—amount recovered to premium, per cent	3.40	5.93

TABLE III—MOTOR BUS INSURANCE

	1927	1926
Number of companies insured	140	118
Amount of insurance carried	$19,962,850	$16,416,365
Premium	$97,904	$79,235
Rate per $100, cents	49	48
Amount of losses	$27,615	$8,819
Amount recovered	$27,542	$8,363
Ratio—amount recovered to premium, per cent	28.13	10.56
Ratio—amount recovered to losses, per cent	99.74	94.82
Number of buses insured	4,745	2,970

TABLE IV—PUBLIC LIABILITY INSURANCE

	1927	1926
Limits	Range from 5/10,000 to 50/100,000 per Bus Each Year	
Premium	$435,048	$289,896
Amount of losses	$115,384	$94,204
Amount recovered	$8,818	$5,927
Ratio—amount recovered to losses, per cent	7.64	6.29
Ratio—amount recovered to premium, per cent	2.03	2.04
Number of buses covered	1,574	1,229
Number of companies	*78	*63

*One other company reported that it carried its own public liability insurance on buses under authority granted by the state commissioner of banking and insurance.

TABLE I—COMPARATIVE SUMMARY, 1927 AND 1926, ALL COMPANIES

	Insurance		Premium		Rate per $100, Cents	
	1927	1926	1927	1926	1927	1926
289 companies—allocated	$656,781,311	$640,150,663	$1,877,797	$1,898,956	28.59	29.66
36 companies—not allocated	38,052,589	38,900,381	111,136	117,718	29.21	30.26
Total—325 companies	$694,833,900	$679,051,044	$1,988,934	$2,016,674	28.62	29.70

	Amount of Losses		Amount Recovered		Ratio—Amt. Recovered to Premium (Per Cent)		Ratio—Amt. Recovered to Amt. of Losses (Per Cent)	
	1927	1926	1927	1926	1927	1926	1927	1926
289 companies—allocated	$615,443	$572,994	$373,744	$661,008	19.90	34.81	59.64	93.63
36 companies—not allocated	4,244	10,405	2,797	8,909	2.52	7.57	65.92	85.63
Total—325 companies	$619,687	$583,399	$376,542	$669,917	18.93	33.22	59.68	93.49

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robbery, pilferage, collision insurance, hold-up insurance, were reported by a number of companies in scattered locations throughout the country.

The report was signed by A. Benham, O. H. Bernd, G. H. Bourne, F. L. Butler, R. S. Child, Stanley Clarke, N. H. Daniels, F. M. Hamilton, A. D. Knox, J. H. Moran, F. J. Petura, D. W. Pontius, J. P. Pulliam, H. M. Shaw, B. L. Tomes, P. E. Wilson, and H. B. Potter, chairman.

Depreciation*

ON JAN. 25, 1927, the Interstate Commerce Commission, by order number 19157, required the electric railway companies subject to its jurisdiction to appear and show cause why an order should not be issued "concerning depreciation charges of electric railways substantially the same as that entered with respect to depreciation charges of steam railroad companies" and specifying the classes of property against which depreciation should be accrued.

On Nov. 2, 1926, the Interstate Commerce Commission, by orders numbered 14700 and 15100, entitled respectively "Depreciation Charges of Telephone Companies" and "Depreciation Charges of Steam Railroad Companies," prescribed systems of accounting for depreciation for such companies. It is the system of accounting for depreciation prescribed for the steam railroad companies in order number 15100 which the commission proposed to apply, with minor modifications, to the electric railway companies subject to its jurisdiction.

The committee has been kept fully advised of the developments in connection with these hearings through Leslie Vickers, economist of the association, who was in constant attendance at these hearings. One or more members of the committee were present at a considerable number of these hearings.

On Oct. 11, 1927, the commission proposed a general revision of accounting rules for steam railroads for the purpose, among other things, of carrying into effect its order number 15100 prescribing depreciation charges for steam carriers.

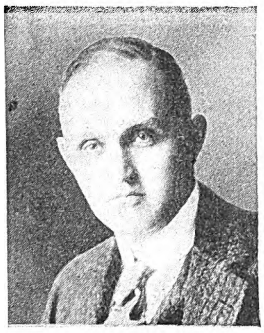
It was obvious that the system of depreciation charges for electric railways tentatively prescribed by the commission in its order number 19157 would require extensive modifications in the present uniform system of accounting for electric railways, prescribed by the commission in 1914. The assistance and co-operation of the committee on standard classification of accounts of the Accountants' Association, under the chairmanship of M. W. Glover of Pittsburgh, therefore was invited.

On Nov. 10, 1927, Ralph R. Bradley, counsel for this committee, appeared in the proceedings and made a formal statement to the commission in behalf of the association. Mr. Bradley stated that the association did not consider it either advisable or desirable to introduce any evidence or to take any active part in the proceedings then pending with respect to the depreciation orders concerning the telephone companies and steam carriers until the entire case as to the steam carriers and the telephone companies was concluded.

It is impossible to overestimate the importance of the proceedings in the steam railroad and telephone cases to the electric railway industry.

The report was signed by F. W. Doolittle, M. W. Glover, Charles R. Harte, A. S. Richey, Richard Sachse, Charles E. Thompson, L. R. Nash, vice-chairman, and Thomas Conway, Jr., chairman.

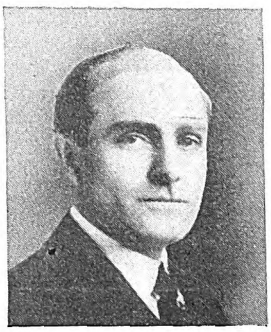
Sub-committee of the committee on National Relations of the American Electric Railway Association.



T. Fitzgerald
Employee-Customer Relations

H. B. Potter
Insurance

L. H. Palmer
Motor Bus Depreciation



Britton I. Budd
Public Speaking

G. A. Richardson
Rapid Transit

Publications

TWO separate duties have been performed by the committee on publications during the past year. The first of these has been the supervision of the association's magazine, *Aera*. The second has been supervision of the work of the statistical department.

At the beginning of the present association year two important changes were made in connection with *Aera*. The first was to eliminate advertising from the magazine in accordance with the decision of the executive committee as announced at the 1927 convention. The second of these changes involved certain modifications in editorial policy. Rather than have *Aera* cover primarily the same field as the commercial press it was felt that there was an opportunity for it to perform a special service which only an association publication could do. It was decided that the magazine should serve as a means to inform members concerning the activities of the association and that it should also undertake the special task of appealing more directly to individuals, particularly those individuals below the rank of executive, with a view to arousing their interest and enthusiasm for the railway business.

The establishment and growth of the statistical department were brought about by the desire of the association to answer all of the requests for special information which were received from members. The following record shows the number of requests answered by bulletins and the number of special requests answered during the last three association years and by months for the first part of the present year:

	Requests for Bulletins	Special Requests	Total Requests
1924-25	9,747	817	10,564
1925-26	11,276	841	12,117
1926-27	12,191	913	13,104
1927-28:			
October	920	93	1,113
November	1,146	95	1,241
December	1,007	84	1,091
January	898	55	953
February	1,070	96	1,166
March	821	77	898
April	991	78	1,069
May	1,810	55	1,865
Total—Eight months	8,663	633	9,296
Same months last year	8,017	653	8,670

Particular effort has been made during the past year to effect the best practicable co-ordination between the statistical department of the association and that of ELECTRIC RAILWAY JOURNAL. Substantial progress had already been made previous to this year, but the situation is one which, dealing with a continually changing body of information, requires constant attention, and the committee believes very definite progress has been made during the past year.

The report was signed by J. L. Alexander, G. B. Anderson, T. W. Casey, Charles Gordon, T. R. Langan, H. H. Norris, Prof. A. S. Richey, W. H. Sawyer, R. S. Tompkins, E. P. Waller, F. W. Doolittle, vice-chairman on statistics; H. V. Bozell, vice-chairman on *Aera*, and J. H. Hanna, chairman.

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Engineers Discuss Work Done

by Committees During Year

Large amount of work completed by all divisions of the Engineering Association. Progress reports presented when work is to be continued. Heavy electric traction committee reports

COMPLETION of the reorganization of committee work of the Engineering Association was effected during the year by the formation of the power division and the purchases and stores division. The others are way and structures and rolling stock. The beneficial results of this system are shown by the progress made. Many committees did not present formal written reports as the work had not progressed sufficiently so that definite recommendations could be made, so the following abstracts do not include reports of all the committees.

Revision of Constitution and By-Laws

THE special committee, appointed by the president to determine the need for revising the present constitution and by-laws of the Engineering Association recommended that a number of changes be made in both the constitution and the by-laws to bring them into conformity with the latest revision of the constitution and by-laws of the American Association; to provide for other changes in procedure made desirable by the new committee rules recently adopted and put into effect: and to obtain clarity of expression where this seemed necessary. The principal revisions proposed are as follows:

1. The membership limitations have been revised to include types of transportation companies other than electric railways.
2. The method of voting on standardization recommendations by member operating companies has been changed from a *viva voce* vote on the convention floor to a letter ballot system; this revision also provides for the weighting of ballots cast on a basis of the amount of dues paid in accordance with the provisions of the American Association constitution and by-laws.
3. The order of business at meetings of the association has been revised to accommodate the needs of the new committee organization and procedure.
4. The method of amendment of the constitution and by-laws has been changed to provide for a weighted letter ballot of member operating companies.

Other minor changes were proposed in the interests of clarity and improved procedure and to obtain wherever possible, agreement with the corresponding section of the American Association constitution and by-laws. The committee recommended that the proposed revised constitution and by-laws be adopted.

The report was signed by F. McVittie, F. H. Miller, and W. W. Wysor, chairman.

Heavy Electric Traction

SIX subjects were assigned to this committee: Manual review, track and third rail bonds, branch line electrification, train operation with reference to articulated trains, train makeup and electrification progress.

Information on the use of supplementary negatives and also methods and extent of practice in reapplying bonds was collected and tabulated. Considerable data also were collected on recommended practice as to contact areas and resistances of rail contacts. The standard dimensions of various kinds of rail bond terminals were submitted by the American Steel & Wire Company, the Electric Railway Improvement Company and the Ohio Brass Company. Additional information was furnished by these three manufacturers as to the compositions and specific resistances of steel and copper alloy welding metals for the application of bonds. It is recommended that this study be continued and that this committee endeavor to secure the co-operation of the electrical section of the American Railway Association on the work now being done in connection with rail bond standardization.

Further information on the use, abroad, of substitute methods for bonding was obtained from the manufacturers selling the apparatus for spraying rail ends with molten metal, tending to show an increase in the application of this method. The committee has initiated several independent investigations abroad, and expects to have information through different channels which will allow giving an unbiased report of what is being done by this method. It is recommended that the subject be continued.

It has been difficult to make progress in the compilation of information concerning rail joint clearance and its effect on rail bond design owing to the great variety of designs of rail joints. Additional designs showing standard sections adopted by various railroads have been obtained during the year. Studies so far show that the variations in design are so great as to indicate that the space provided for bonds underneath the splice bars has been arrived at without any consideration whatever for concealed bonds. It is also found that the spacing of the bolts is highly variable, which feature together with the contour of the top of the splice bars requires considerable variation in the design of bonds for application to the head of the rail. An interesting illustration of the diffi-

E. D. Dreyfus
Engineering-Accounting

W. W. Wysor
Constitution and By-Laws

A. T. Clark
ELECTRIC RAILWAY JOURNAL Maintenance Contest

H. F. Brown
Heavy Electric Traction

P. V. C. See
Subjects

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culties in adapting rail bonds to many of the standard rail joints can be made after further study for presentation to the designers of the rail joints. It is hoped that ultimately some co-operation can be effected between the various committees interested in rail joint and bond design. It is recommended that this subject be continued.

Continued progress has been made during the past year in the introduction of motive power, other than steam, on branch lines and terminals. The self-propelled gas engine car is finding increasing favor in replacing steam engine operated trains of two or three cars on branch lines providing infrequent service. The operation of such cars has been successful. Previous steam operating costs have been materially reduced to such an extent as to pay for the car in some instances in a period of one to two years. The gas engine cars of later design show an increase in weight and power; more than half of those ordered in 1927 exceed 100,000 lb. in weight, with engines of 225 hp. or more. The development of the heavier and more powerful gas engine car is accompanied by the introduction of electric drive in place of mechanical gear shift, and all but six of the cars ordered in 1927 were of this type.

Locomotives of the straight oil-electric drive, or supplemented with storage batteries, have been installed in railroad terminals in an effort to find a type of motive power other than steam that does not require the installation of an overhead contact system and electric substations for its operation. The trend in motive power for terminals is not yet clearly defined, and the committee reports on several interesting types of locomotives installed during the past year which indicate that this development is still in the formative state.

The report includes tabulations of motor cars and trailers ordered from 1922 to 1927, inclusive, and recent electric locomotives built, in addition to giving descriptions of several oil engine and oil-electric units. It also describes three recent types of switching locomotives of unusual design.

The committee has obtained and tabulated additional information and data on articulated train units placed in operation during the past year. Information has been received from eleven companies that are operating articulated train units and it includes all available data for the United States, Canada, and Europe. The committee wishes to call attention to the increase in number of properties and the increased number of articulated units placed in operation during the past year, and has endeavored to explain the reasons for this increase by obtaining authentic information from companies operating this type of equipment over a period of years, which information is herewith submitted:

Articulated trains of from two car units with three trucks to ten car units with eleven trucks have been in successful operation for a period of more than ten years in England and elsewhere abroad, before its development and adoption in this country. For the past five years the development and adoption of articulated train units have been carried on in various parts of this country by properties operating subway and elevated lines, surface lines and interurban lines. It is, therefore, apparent that there are certain advantages in articulated train units over single cars with two trucks in trains made up of a group of double truck cars coupled together, which caused a number of operators to build and place a large number of trains of this type in service. Some operators, particularly those operating trains in rush-hour service only, have found it economical to rebuild old equipment, since peak hour service is the most economical way to use older equipment; whereas other properties having a preponderance of train operation during the entire day have designed and built new articulated units in large numbers for their particular service.

More fully to acquaint the transportation industry as a whole with this type of equipment, a questionnaire was prepared and sent to all companies operating articulated trains to obtain their reasons for development and adoption of this type of equipment, and to bring out the advantages and economies effected in their operation, as well as any disadvantages and their effect on operation. The advantages given in the summary of all information received are: Saving in platform labor, better distribution of passenger load, safety to passengers passing from one car to another, lower cost of construction due to omission of operating cabs on coupled ends, lower cost of maintenance due to one less truck per train and ommission of cabs, drawbars and draft rigging on coupled ends. It was recommended that further study and the collection of descriptive information and engineering data on articulated trains be made, and that the subject be continued.

The present practice in multiple unit train makeup and operation varies so widely among the numerous companies operating this type of equipment that the committee has deemed it advisable to give its attention this year to the preparation of a questionnaire which will cover the salient features of American practice in this subject. The questionnaire will be sent out next year to the various companies operating such equipment, and the replies tabulated. It is recommended that this subject be continued for the further collection and compilation of data.

The committee made an extensive report of the electrification progress in this country. It described the progress and plans of the Great Northern Railway, the New York Connecting Railroad, the Long Island Railroad, the New York, Westchester & Boston Railway, the Pennsylvania Railroad, the Reading Railroad, the Delaware, Lackawanna & Western Railroad, the Cleveland Union Terminal and the Boston, Revere Beach & Lynn Railroad. It also noted in detail the progress of many foreign railways.

The report is signed by A. H. Armstrong, L. W. Birch, S. B. Cooper, A. H. Daus, J. C. Davidson, J. H. Davis, J. V. B. Duer, H. H. Febrey, J. T. Hamilton, W. E. Huber, E. C. Johnson, J. S. Thorp, L. S. Wells, L. C. Winship, G. I. Wright, Morris Buck, secretary, J. M. Bosenbury, vice-chairman, H. F. Brown, chairman and F. H. Miller, sponsor.

Way and Structures Division

Way and Structures Special Committee No. 1— Manual Review

CHANGES in grade of a number of existing Manual sections were considered and the following recommendations offered:

That the following Manual sections be advanced from the grade of recommendation to that of standard:

W100-26—design for plain girder rails and splice bars.

W105-26—specification for solid manganese-steel special trackwork for girder rail.

W108-26—specification for plain bolted special trackwork.

W109-27—specification for rail-bound insert type special trackwork.

W110-21—recommended distances between tangent track centers through special trackwork layouts for all track gages

W114-24—design of solid manganese-steel crossings; steam railroad over electric railway (for angles 90 deg. to 60 deg. inclusive).

W115-24—design of solid manganese-steel crossings; steam railroad over electric railway (for angles 60 deg. to 40 deg. inclusive).

W116-25—design of bolted rail crossings; steam railroad over electric railway (for angles 90 deg. to 50 deg. inclusive).

W117-24—rules for determination of flangeways and gages on curves.

W118-24—design for $5\frac{1}{2}$x$\frac{9}{16}$-in. track spike.

W119-24—specification for design and manufacture of tie rods.

W120-25—design for bolted rail crossings; steam railroad over electric railway (for angles below 50 deg. to 30 deg. inclusive).

W121-26—design of bolted manganese-steel crossings; steam railroad over electric railway (for angles below 45 deg. to 30 deg. inclusive).

That Manual section W101-15, protection of contact-rail where protected third-rail is used, be referred to the proper committee for study and if no revisions or modifications are required that it be advanced to standard.

That Manual section W111-25, car clearance easements with standardized frogs for various gages, be combined with Manual section W13-24, system of uniform track spirals and simplified system of single branch-off frogs, the combined section to be a standard.

That in Manual section W113-23, specification for street railway track construction, a footnote be inserted calling attention to the revised serial designations of other Manual sections.

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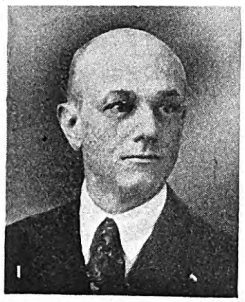

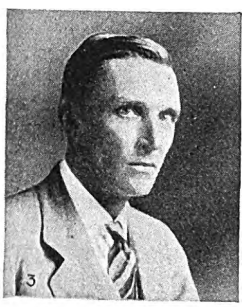

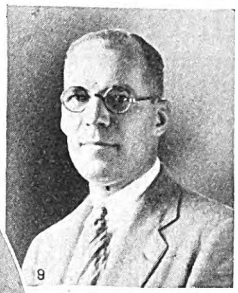

1—W.R.Dunham, Jr. Manual Review

2—E. M. T. Ryder Special Trackwork

3—S. Clay Baker Track Ballast and Drainage

4—C. A. Smith Wood Preservation

5—Chester F. Gailor Arc Welding

6—A. T. Spencer Alloy steels other than Manganese for Special Trackwork

7—A. E. Harvey Pavement

8—Howard H. George Group Chairman

Way and Structures Division Chairmen

9—A. Hughes, Jr. Motor Bus Garage Design

10—C. L. Hawkins Track Construction

11—W. W. Wysor Rail Corrugation

12—E. D. Eckroad Joint Railway and Bus Terminal

13—C. A. Alden Light Section Rail

14—C. H. Clark Track Gage

15—L. A. Mitchell Study of Foundation and Supporting Structures for Steam Railroads

That Manual section W200-23, rules and regulations for the government of employees of the way department, be withdrawn from the Manual but that a referendum page be substituted calling attention to its withdrawal with a reference to the Proceedings in which the information can be found.

That Manual section W119-24, specification for design and manufacture of tie rods and Manual section W16-24, specification for carbon steel rails of standard section be given further study next year.

That Manual section W112-22, specification for low carbon-steel track bolts be changed to conform with the A.S.T.M. specification for the same material. It is further recommended that the specification be then advanced to the grade of standard.

The report was signed by T. H. David, D. J. Graham, James S. Mahan, D. H. Walker, and W. R. Dunham, Jr., chairman.

Way and Structures Special Committee No. 12—Rail Corrugation

WORK of other associations and interests on the subject are digested in the report of special committee No. 12, rail corrugation. This digest indicates that the trend elsewhere is to put more emphasis on the matters of rail steel processing and physical qualities in an attempt to secure a rail steel which will be economic in cost and resistant to corrugation.

A brief on the subject of the "fatigue" qualities of rail steel is given. It indicates that if rail surface failure is to be avoided, the stresses in the surface fibers should not exceed 50,000 lb. per sq.in. with present rails and that this limit, known as the "endurance limit" is quite accurately given by the product obtained by multiplying the Brinell hardness number by 250.

A discussion on the subject of temperature stresses show that the stress induced in steel which is not free to expand or contract is 200 lb. per sq.in. per degree F. of temperature change and that daily variations may be as high as 6,000 lb. per sq.in. and seasonal variations as high as 20,000 lb. per sq.in.

The committee recommends that the investigational work on this subject should be continued with the aim in view of securing more definite information on the general subjects of rail stresses and corrugation phenomena.

Certain new data are given showing the growth of corrugations, also data relative to other physical characteristics of corrugations are presented.

An addition is made to the bibliography presented last year. No new conclusions are presented but a re-emphasis of those presented last year in which the basic thought was that of so increasing the resisting power of the track structure, or so reducing the loads imposed on the structure (or doing some of both) that the wheel rail contact stresses would be reduced below the limit above which failure of the rail surface results.

The report was signed by Chas. H. Clark, E. B. Entwisle, D. D. Ewing, R. B. Fehr, H. Fort Flowers, C. R. Kinnear, T. J. Lavan, E. L. Lockman, W. H. McAloney, K. W. McPherson, A. M. Nardini, J. Ormondroyd, J. T. Porter, H. Jackson Tippet, C. L. Van Auken, H. S. Williams, vice-chairman, and W. W. Wysor, chairman.

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Rolling Stock Division

Rolling Stock Special Committee No. 4—Lighting

CAR lighting was studied this year with a view to improvements and economies due principally to standardization and uniform practices. Certain supplementary data on car lighting practice were prepared covering Mazda C automatic cutout lamps, headlighting and other accessory lighting. For the purposes of conciseness, completeness and freedom from confusion the committee recommended that Manual sections E119-27 and E218-27 now appearing in the 1927 Supplement and the supplementary data prepared during the past year be combined into a single Manual section and be approved as a recommended practice on car lighting. Certain corrections in Manual section E218-27 are also included. This proposed new Manual section is submitted as Appendix A.

An investigation was made of practices in shop, office and yard lighting. The results of this study are embodied in Appendix B which is submitted for approval as a recommended practice Manual section.

A table showing the comparative annual demand for street railway lamps together with other information on lamps and lighting of interest to the electric railway industry was prepared as Appendix C.

The investigation of car lighting practice was continued considering in particular the application of recently developed Mazda C automatic cutout lamps to electric railway service. A study was made of headlighting and miscellaneous accessory lighting. As a result of this study, descriptions of suitable lamps and lighting equipment for various applications were prepared.

The new proposed Manual section includes corrections of the present Table I of Manual section E218-27 as follows:

1. The 36-watt 105-130-volt, S19 clear bulb lamp has been removed from the table.
2. The 56-watt 105-130-volt, A21 inside frosted bulb lamp with 587 approximate initial lumens and the 4 7/8 in. maximum over-all length should be substituted for the 56-watt, 105-130-volt, S21 clear bulb lamp.

In order to permit standardization of car lighting equipment the committee proposed originally to include additional information on lamp holders and reflector glassware, but sufficient data were not available at the time of the completion of the report.

The committee was unable to reach any conclusions on desirable methods for inspecting lamps for a given system and, therefore, recommended that this item be studied further when more information is available.

Methods of lighting the shops, offices and yards of electric railway properties were investigated and recommendations for the best practice developed. Multiple lighting with 115 volts was found to be the most satisfactory system due to the availability of more satisfactory lamps and lighting equipment for the various applications. Sections 1, 2 and 3 of the Manual on Recommended Practice of Illumination of the Association of Railway Electrical Engineers are referred to as sources of references on illumination design when using such multiple circuits.

For installations where trolley voltage must continue as the lighting supply applications of arc resisting and other five-in-series lamps have been presented. A brief description of suitable reflecting equipment, suggestions on the arrangements of lighting outlets and a table of recommended lighting intensities have also been included.

All the information on shop, office and yard lighting has been prepared as a single proposed Manual section appearing in the report as Appendix B.

Subsequent to the assignment of subjects for investigation, it was suggested that the committee report on preventive measures for avoiding glare on the windshield to operators of motor coaches. It was the opinion of the committee, however, that this subject could not receive proper treatment unless other applications of motor coach lighting were also included. As its program would not permit such extra study this year the committee recommended that the entire subject of bus lighting be assigned for investigation next year.

As a result of its investigations the committee determined that the recommended lighting intensity of foot-candles on the 45-deg. reading plane for the interior illumination of an electric railway car can be obtained with proper applications of the Mazda C automatic cutout lamps. It was also determined that careful consideration should be given to the selection of proper types and sizes of reflecting accessories and adequate light sources for headlighting, rear-end marking and other accessory lighting, to assure safe and efficient operation of electric railway cars.

Adequate systems of artificial illumination for shops, offices and yards are quite important for the operations involved. The committee therefore believe that the information prepared should be made part of the Manual.

The subjects investigated during the current year will require further study and should be continued and in view of these conclusions the committee made the following recommendations:

1. That the material presented in Appendix A of the report be approved as a recommended practice Manual section on car lighting.
2. That Manual sections E119-27 and E218-27 be withdrawn.
3. That the material submitted as Appendix B be approved as a recommended practice Manual section on shop, office and yard lighting.
4. That all the subjects assigned this year be continued for further study.
5. That the new subject of lighting for motor coaches be assigned.

The report was signed by A. L. Broe, W. W. Brown, H. F. Deininger, E. E. Dorting, H. G. Lewis, J. P. Staples, H. A. Otis, vice-chairman, and R. W. Cost, chairman.

Rolling Stock Special Committee No. 8—Motor Brushes

THE report takes into consideration data collected on this subject by the manufacturers of railway motors; also that obtained by members of the committee. Before the formation of this committee the manufacturers had determined that side wear of carbon brushes on multiple-ventilated railway motors was caused by the abrasive action of dust taken into the motor with the ventilating air. Such observations have been substantiated by tests carried on by members of this committee.

Since the committee was first appointed, improvements in ventilation methods have increased the brush life from two to ten times that previously obtained.

The committee considered the following as having a bearing on the side wear of brushes: (1) condition of commutator, (2) maximum advisable wear of carbon box, (3) recommended limit of side wear of brush, (4) height of carbon box from commutator, (5) grade of brush and (6) spring pressure on brushes.

As the result of its investigations the committee reached the following conclusions:

1. That side wear of carbon brushes in multiple-ventilated railway motors is in the majority of instances caused by dust that enters the motor with the ventilating air. This dust, acting as an abrasive between the brush and the carbon box, causes side wear of the brush and roughens the brush surface of the carbon box.
2. Elimination of either dust or movement of brush in carbon box will prevent side wear of brushes.
3. In the selection of brushes for railway motors operators should not be guided solely by the brush mileage obtained but should give due consideration to the effect produced on the communtator and choose a brush that polishes without scouring. Such a brush will ride smoothly on the commutator thereby reducing movement in the carbon box to a minimum. A brush that does not polish but etches and roughens the commutator will not ride smoothly and will cause flashing

Brush action on commutator is cumulative, *i. e.*, either the surface improves with age or gets worse. This latter condition at times necessitates the removal of the motor from service for commutator turning.

4. The data collected by the committee shows that changes made in the past several years have greatly reduced side wear of brushes and to the extent that it no longer is the limiting factor in carbon brush life.
5. That it is not to be expected that brush mileage on multiple-ventilated railway motors will equal that obtained on series-ventilated or totally enclosed motors.
6. That the brush life obtained will depend largely upon operating conditions, being affected by the character of the dust

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(*i. e.* abrasive or not) paved or unpaved streets, speed of equipment, etc.

7. That a brush mileage of 10,000 to 15,000 miles for multiple-ventilated motors should be considered satisfactory.

8. That unsatisfactory brush life should be brought to the attention of the motor manufacturer.

9. For the smaller motors, up to 50 to 60 hp., results indicate that the use of one brush per holder, with either one or two springs per holder, gives best results, both for the condition of the commutator and for brush life.

10. That the brush-holder spring pressure should be sufficient to keep the brushes on the commutator at all times.

To obtain maximum brush life, it is recommended that the motor be modernized in respect to ventilating features, that the motors be blown out frequently (every 1,500 to 2,000 miles) with dry compressed air, that careful consideration be given to the brushes used not being guided entirely by price and that only brushes that are graphitized be used.

Carbon boxes with the brush surface worn in excess of $\frac{1}{32}$ in. should be brought back to normal or replaced and the height of the carbon box from commutator should be from $\frac{1}{8}$ to $\frac{3}{16}$ in.

Brushes having side wear in excess of $\frac{1}{16}$ in. should be replaced. Commutators that have a rough surface or slight flat spots should be turned, carefully undercut and polished.

The report was signed by H. Childs, H. T. Hurlock, J. Markel, F. W. McCloskey, R. D. Voshall, R. A. Hutchins, chairman.

Committee No. 9—Noise Reduction

TESTS have been made on the value of wheel silencing schemes which show the resilient wheel to be the most silent, followed in the order of their effectiveness by the wheel with lead insert, and the wheel with bolted muffling pads. Tests were also made of the worm-drive truck which prove it to be quieter in operation than the conventional truck. Comparative tests between the ordinary wooden floor construction and composition flooring show the composition floor to be slightly better from the noise standpoint.

The committee made a plea for more perfect gearing as a noise preventive.

A series of tests on track constructed of steel ties and compressed concrete as compared with track on wooden ties and compressed concrete pavement show the wooden tie construction appreciably quieter. Tests were reported in which a noisy car was taken and by making successive changes the noise of the car is reduced 47 per cent, thus demonstrating that present cars may be made to operate without objectionable noise. The methods employed by the Market Street Railway of San Francisco to reduce noise are described. Attention is called to one of the basic principles which must be complied with if sound insulation is to be applied with maximum effect.

As a result of its studies the committee made the following recommendations in the interest of noise reduction in car operation:

1. Adoption and consistent use of higher standards of maintenance.

2. Added effort toward the design and use of lighter weight cars.

3. The reduction of unsprung weight.

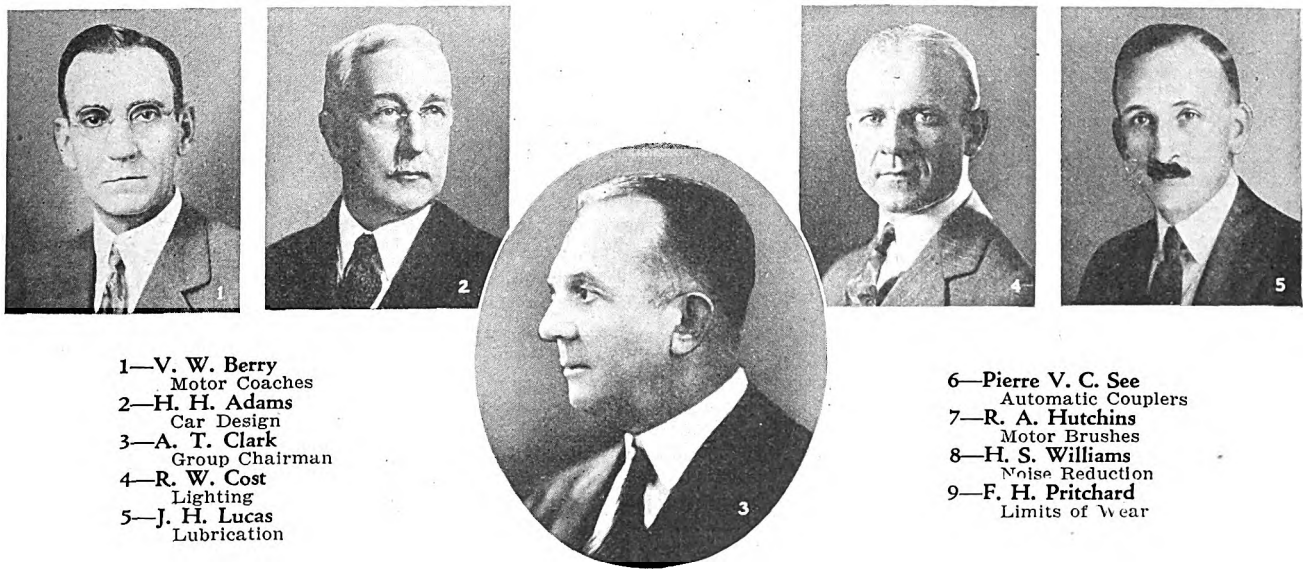
4. Commercialization and use of this committee's methods of noise reduction as outlined in this and previous reports.

5. Use of track construction that will give an adequate measure of resiliency.

6. Reference of the association's gear defect gage to the rolling stock committee with the request that this be revised with due regard to noise. Also that standards covering the inspection of gears be considered, giving special attention to limits of warpage and eccentricity.

7. As the subject of noise reduction has not been exhausted, the committee recommends continuance of its work.

The report was signed by C. Bethel, R. S. Beers, N. R. Brownyer, C. J. Ellis, T. H. Minary, Robert M. O'Brien, E. R. Rath, R. D. Voshall, H. S. Williams, chairman.



1—V. W. Berry
Motor Coaches
2—H. H. Adams
Car Design
3—A. T. Clark
Group Chairman
4—R. W. Cost
Lighting
5—J. H. Lucas
Lubrication
6—Pierre V. C. See
Automatic Couplers
7—R. A. Hutchins
Motor Brushes
8—H. S. Williams
Noise Reduction
9—F. H. Pritchard
Limits of Wear

Rolling Stock Special Committee No. 11—Current Collecting Devices

THE committee obtained data from 81 member companies operating a total of 28,000 cars. However, due to a lack of any previous information on standards for current collecting devices and the inability to obtain sufficient new

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information, the committee is unable, at this time, to make definite recommendations for the adoption of the designs and specifications submitted. The report is confined to a study of the details connected with the designs of a trolley base, trolley pole, harp and wheel, the designs and specifications are submitted as information only to afford the industry an opportunity for criticism and to permit further study before a recommendation for adoption is made.

The committee recommended that the study of this subject be continued in order to take into account any criticisms of the material which is contained in the report and to complete the work of developing standards for a complete current collecting device and for associated parts.

The report was signed by W. C. Klein, H. S. Murphy, W. Schaake, Dwight L. Smith, R. E. Wade, and H. Savage, chairman.

Power Division

Trolley Wire Reels

VARIOUS proposals were discussed at two meetings of special committee No. 8 held during the year and three standards set up together with a standard bushing. These proposed standards were turned over to a sub-committee composed of manufacturer members to check up for shop practice, usefulness and capacity.

As the result of these investigations this committee has agreed that:

1. There apparently is a need in the industry for three standard reels for shipping and stringing trolley wire.

2. These reels preferably should be designated by numbers and should have the following capacity dimensions.

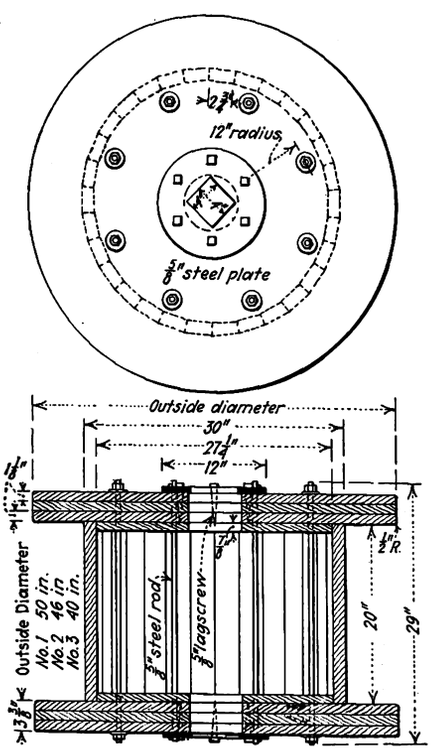
	Flange Diameter	Drum Diameter	Drum Width
No. 1.....	50 in.	30 in.	20 in.
No. 2.....	46 in.	30 in.	20 in.
No. 3.....	40 in.	30 in.	20 in.

3. There should be a single bushing for all three reels which should be standardized except for the arbor hole, the size and shape of which may be left to the discretion of the user.

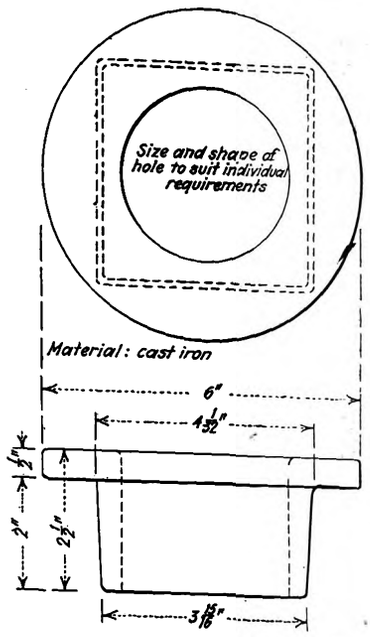
4. The committee is of the opinion that in general the user will prefer to provide his own bushing.

The committee, therefore, has prepared drawings showing an end elevation and cross-section of a reel with dimensions for the three proposed standard sizes, details of the proposed standard bushing and tables showing the capacities and application of the proposed standard reels. One of the tables and the drawings are reproduced herewith.

The report is signed by W. H. Bassett, C. L. Hancock, Kirk J. Keith, A. J. Klatte, Dwight L. Smith and J. F. Neild, chairman.



Side elevation and cross-section through center of proposed standard wooden reel for trolley wire



Bushing for proposed standard wooden reel for trolley wire

Manual Review

SPECIAL Committee No. 1, Manual Review, contained recommendations that special committees be formed next year to consider the revision of certain Manual sections. It was signed by L. W. Birch, H. W. Codding, John Leisenring, George F. McClellan, Henry W. McRobbie, W. J. Quinn, A. Schlesinger, R. G. Winans and J. Walter Allen, chairman.

Power Rectifiers

DEFINITE statements concerning the various phases of the art as it exists at present were made by the committee. The results of another year of operating practice were studied and summarized, and suggested log sheets to make possible the securing of comparable information from different installations were prepared.

Among the statements made by the committee are the following: The phrase "mercury vapor power rectifier" is preferred to "mercury arc power rectifier" because it is more descriptive of the apparatus. The power factor of the

CAPACITIES FOR STANDARD WOODEN REELS FOR TROLLEY WIRE

Reel Sizes						300,000 Circ. Mil Wire						0000 Wire						000 Wire						00 Wire					
Outside diam., inches	Diam. of drum, inches	Inside width, inches	Volume, cubic inches	Type of wire	Nominal reel capacity	Turns per layer	Number of layers	Average feet per turn	Feet	Pounds	Margin, inches	Turns per layer	Number of layers	Average feet per turn	Feet	Pounds	Margin, inches	Turns per layer	Number of layers	Average feet per turn	Feet	Pounds	Margin, inches	Turns per layer	Number of layers	Average feet per turn	Feet	Pounds	Margin, inches
50	30	20	22,060	Round.....	5,000	36	16	10.13	5,840	5,300	1.23	43	19	10.15	8,290	5,320	1.26	48	21	10.11	10,200	5,180	1.39	54	24	10.14	13,160	5,300	1.23
				Grooved...	4,500	34	16	10.24	5,580	5,060	0.82	41	19	10.25	7,985	5,120	0.84	46	20	10.11	9,310	4,730	1.40	51	22	10.11	11,340	4,570	1.37
46	30	20	16,280	Round.....	4,000	36	12	9.57	4,140	3,755	1.42	43	15	9.65	6,220	3,990	1.09	48	17	9.67	7,890	4,010	1.03	54	19	9.66	9,910	3,992	1.07
				Grooved...	3,500	34	12	9.66	3,945	3,580	1.11	41	14	9.61	5,520	3,540	1.25	46	16	9.66	7,110	3,615	1.12	51	17	9.34	8,100	3,265	1.33
40	30	20	8,540	Round.....	2,000	36	7	8.86	2,232	2,025	1.16	43	8	8.82	3,035	1,948	1.32	48	9	8.82	3,810	1,935	1.31	54	10	8.81	4,760	1,918	1.35
				Grooved...	1,500	34	6	8.76	1,788	1,621	1.56	41	8	8.86	2,905	1,867	1.14	46	9	8.87	3,670	1,867	1.13	51	10	8.88	4,530	1,826	1.08
						Diameter— Round, 0.548 in. Grooved, 0.574 in. Weight, 907.58 lb./1,000 ft.						Diameter— Round, 0.460 in. Grooved, 0.482 in. Weight, 641.86 lb./1,000 ft.						Diameter— Round, 0.410 in. Grooved, 0.430 in. Weight, 503.00 lb./1,000 ft.						Diameter— Round, 0.365 in. Grooved, 0.392 in. Weight, 403.00 lb./1,000 ft.					

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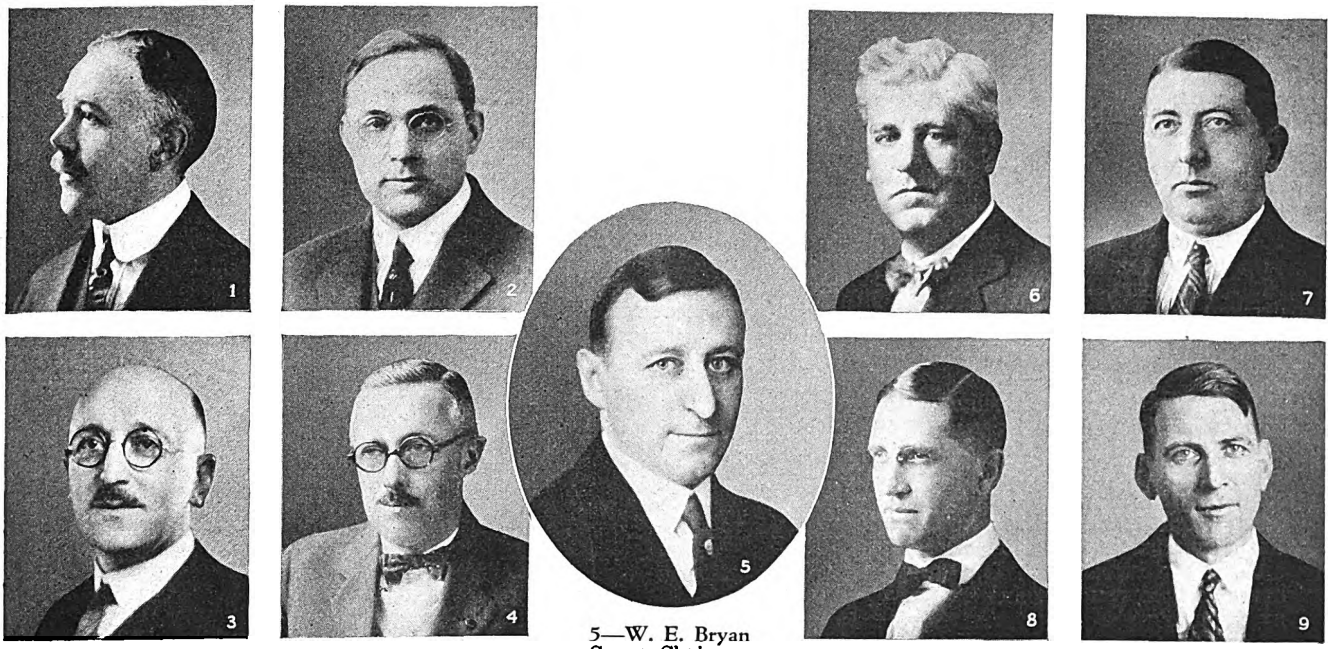

1—J. Walter Allen, Manual Review
2—H. W. Codding, Power Rectifiers
3—Milton W. Cooke, Power Contracts
4—Dwight L. Smith, Catenary Specifications
5—W. E. Bryan, Group Chairman
6—H. S. Murphy, Trolley Wire Wear
7—W. J. Quinn, Radio Interference
8—J. F. Neild, Trolley Wire Reels
9—A. J. Klatte, Conduit Specifications

rectifier shall be measured on the input side of the rectifier transformer. With overload protection on the primary oil circuit breaker, the rectifier and its auxiliaries are not affected adversely by direct-current short circuit. Dielectric tests and insulation resistance tests should be made similar to those used in testing transformers for use on equal voltages. The voltage regulation shall be taken as the percentage variation of the direct current voltage, over the specified load range, with maintained primary voltage on the rectifier transformer. The regulation shall be measured using power from a source having low reactance. The efficiency shall be obtained by the method of segregated losses.

A questionnaire was sent to 26 operating companies in the United States and Canada requesting data on characteristics of their rectifiers and experience thus far obtained in operation, and 23 replies were received. It was found that information on interruptions, their causes and durations, was difficult to obtain. Accordingly, two log sheets were developed, one for daily reports and one for monthly summaries.

The 23 companies that replied operate 39 rectifier sets in 28 substations. Out of the 39 sets, 7 are operated in parallel with synchronous converters and 32 are not. Arc-backs or internal flashovers continue to be the single largest cause of interruptions to service, but from these usually no damage results to the equipment and it is possible to put the rectifier back in service at once. Aside from arc-backs, most of the interruptions were caused by troubles in the auxiliary equipment.

Operators of twelve substations stated their preference for the rectifier over the synchronous converter. One stated no preference and three stated that they had had insufficient experience to justify an opinion.

The report was signed by C. A. Butcher, C. L. Doub, A. M. Garrett, Otto Naef, F. W. Peters, W. S. Richhart, U. S. Thorp, G. I. Wright and H. W. Codding, chairman.

SUGGESTED FORM FOR DAILY LOG SHEET

.....COMPANY
DAILY REPORT OF MERCURY VAPOR POWER RECTIFIERS IN.....SUBSTATION
FOR.....192

1	Total hours in service.....
2	Total hours not available for service.....
3	Kw.-hr. output.....
4	Kw.-hr. input.....
5	Kva. input.....
6	Maximum d.c. load in kw.....
7	Amount of cooling water used.....
8	.....
9	Causes of interruptions—(a) arc-backs—No...
10	Total time out of service.....
11	(b) Other failures in rectifier—No.....
12	Total time out of service.....
13	(c) Rectifier auxiliaries—No.....
14	Total time out of service.....
15	Rectifier control equipment—No. .....
16	Total time out of service.....
17	(e) Cause unknown—No.....
18	Total time out of service.....
19	.....
20	.....

Columns for five units and a column for remarks are provided on this form. The monthly report form is quite similar to the daily one.

Purchases and Stores Division

Investment in Material and Supplies and Stores Accounting

PURCHASES and Stores, special committee No. 3, on the investment in material and supplies and the cost of operating stores, and the committee on stores accounting worked jointly in making a study of investments in materials and supplies and the cost of operating stores. A questionnaire was prepared by the committee and was sent to 39 member companies whose systems embrace 15,108 miles. Replies were received from 36 companies with an aggregate mileage of 14,181, or 93 per cent of the total solicited.

As a result of the replies the committee is of the opinion that all road material, shop material, power station material, articles in process or manufacture, fuel, power station and miscellaneous material, stationery, dining car supplies, all scrap and miscellaneous materials and supplies other than those for shops, maintenance of way and structure and power, should be charged as and when the invoice is approved for voucher to account No. 411.

Materials retired from property and equipment accounts but not released should not be charged to account No. 411 until released, and the committee suggests that if not inconsistent such charges be carried until released in account No. 420.

It is emphatically recommended that there should be a uniform material stock report that all railways would use to take the monthly materials and supply balances as carried on account No. 411; this stock report to show also the monthly receipts, disbursements, balances on hand, turnovers, etc.

The committee believes a fair measure of comparison for cost of handling to be

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a ratio between the value of material on hand available to be used and the value of materials dispersed and charged to closed accounts. However, before comparisons would have much value, standard methods of material accounting are necessary and a standard practice for charges to stores expense.

The report was signed by A. S. Duncan, A. L. Fisher, W. P. McArdle, C. A. Harris, co-chairman; W. S. Stackpole, F. E. Wilkin, and R. A. Weston, co-chairman.

Manual Review

DISCUSSION of the method for handling freight and express bills by special committee No. 1, Manual Review of the Purchase and Stores Division, developed the opinion that some revision was necessary before agreement could be reached as to the inclusion of this method in the Manual. It was felt that the method recommended for handling the charges to the account should be revised so as to permit miscellaneous freight and express bills of small amounts to be handled through a suspense account for clearing periodically, if it is found to be more economical to do this. The committee recommends that the following revisions should be made in the method for handling freight and express bills now included in the 1926 Engineering Proceedings:

Eliminate the last two paragraphs under "Method of Handling the Charges to the Account" as shown on page 612 of the 1926 Engineering Proceedings, and substitute the following:

It is realized, however, that the feature of handling miscellaneous freight and express charges of small amounts through materials and supplies account No. 411 may in some cases be uneconomical, in which case these charges may be handled through a suspense account to be cleared periodically; or by direct charges of these expenses to the account to which the materials would ultimately be charged.

The committee also recommends that the simplified invoice form approved by the 1927 committee on purchases and stores be included in the Engineering Manual as a recommended form.

The committee studied Manual section P. S. 100-24, "Classification of Scrap Materials," with the idea of bringing the "Classification of Ferrous Scrap," included in this Manual section, more nearly into conformity with the simplified practice recommendation No. 58.

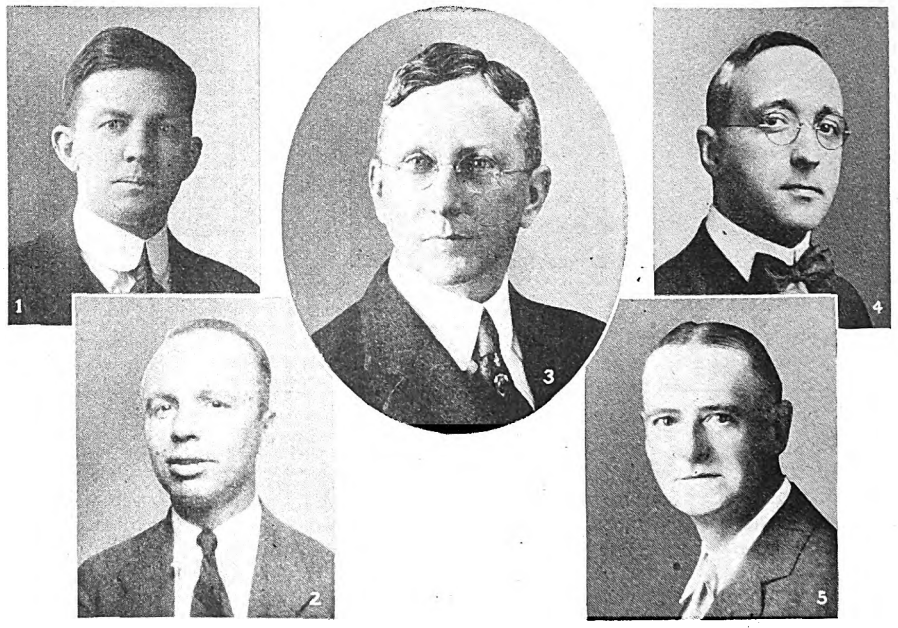
Recommendations were also made that the two following revisions in Manual section P. S. 106-27 be approved for inclusion in that Manual section: On page 71, stock records, "the word average might be eliminated in the last line, as many companies do not use average prices. Neither is it always necessary that a price record show all issues." On page 71, scrap material, the last line should read, "The scrap so accumulated should be sold by the purchasing agent periodically to the best advantage of the company."

The report was signed by C. A. Harris, A. E. Hatton and J. Fleming, chairman.

Price Records and Pricing Materials

SPECIAL committee No. 4, a joint committee, presented a tentative report on recommendations of methods and practices for keeping price records, and pricing materials and supplies received and issued.

This report covered price records and methods of pricing materials as applicable to purchased material only. It does not cover price records and methods of pricing materials manufactured by railway properties and touched lightly on salvaged material pricing.



1—**John Fleming**
Manual Review
2—**W. E. Scott**
Standard Packages
3—**J. Y. Bayliss**
Group Chairman
4—**C. A. Harris**
Material and Supplies
5—**Albert A. Ordway**
Price Records

The suggestions of methods and practices for keeping price records were divided into (1) bin pricing records, and (2) other price records.

The committee reviewed the method of bin pricing now in use by a number of properties. The advantages claimed for this method are that clerical work in the office is saved in pricing the requisition; that errors in prices are lessened; as material may be wrongly identified in the office for pricing. This system familiarizes general stores stockmen with the value of the material; which has a good moral effect, especially in reference to quantities on hand and quantities to be ordered. It also has the same moral effect on sub-storeroom and maintenance employees who use the materials.

There are several other types of price records. Some are in loose-leaf form, some on loose cards filed in cabinets or trays, some are kept in price books which are re-written periodically by changing plates on an addressograph, and some are kept in so-called visible record equipments. This committee suggests that single item visible cards be used, inserted in frames to overlap so that the description and current price is always visible.

Price record may be written up by description, with items in alphabetical, numerical and size order, the same as stock book. In writing the description the noun should appear first, with full description following, for example: Shovels, long handled, round point.

Where the same items has many sizes, the description should appear first in alphabetical order and the sizes follow in numerical order.

Price records should be kept in stores department because of the following reasons:

1. Stores department employees are more familiar with the materials and therefore better fitted to apply proper price.

2. Employees continually accounting for and pricing materials become specialized in the work.

3. It provides a double check on pricing and accounting, because opportunity is given the accounting department to check the work.

4. It provides a short cut for doing the pricing and accounting, that is, with the least complication.

5. Results of pricing and accounting problems can be obtained more rapidly if work is performed at the stores department.

This committee did not recommend use of average price for all classes of material. Many railways do not use this method on account of amount of work required and liability of errors if decimals are used to any great extent. However, an average cost price may be obtained by taking the total quantity disclosed at last inventory, or last months balance, and adding current months purchases in quantity. Then deducting issues for current month based on previous months price, divide the value obtained by the remaining units to establish a new price.

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Affiliated Association Reports

T. & T. committees present results of study on subjects of service betterment, bus operation and safety. Claims Association also reports on safety. Freight accounting methods discussed by accountants

FEWER reports than in previous years were presented this year by committees of the Accountants' and Claims Associations. The Transportation & Traffic Association presented three reports, as it has for several years past. They are published in abstract below, as is the report of the committee on safety of the Claims Association, and also that on freight accounting by a committee of the Accountants' Association. Reports of other committees of the latter body appear in the account of its sessions.

Service Betterment

EACH individual operator was urged by the committee on service betterment to analyze his own local problems. The value of visits of the personnel to other properties was also emphasized. Direct personal contact with others of the industry will be found productive of the greatest good.

Scientifically planned stop systems, increased frequency of service, spacing methods, traffic regulations, fare collection, superior equipment, instruction of trainmen—all are considered exclusively as sources of time saving.

Congestion, inadequate traffic ordinances, the slow-moving trucks and wagons, and the street cars are the chief causes of slow traffic movement in the large cities. The remedies in the cases of the first three apparently are radical ones, but the street car is perfectly capable of higher speed and need not remain in this category of delay producers. It cannot be too strongly emphasized that the problem of securing faster operation covers everything that happens to a car between terminals.

Means for the increasing speed of cars as recommended by the committee are: The elimination of stops, relocation of stops, the skip-stop plan, the staggered skip-stop, the creation of loading zones, express street cars with local bus operation, and express street car and local street car operation, the adoption of one-way streets, elimination of left turns, restriction of heavy loading on congested streets to certain hours of day or night and reduction in the number of passenger stops. Automatic electric signals, properly located, keep cars spaced and enforce schedules.

The stationing of a traffic officer or the installation of "stop" and "go" signals on congested streets would usually expedite traffic movements. However, if the traffic volume does not warrant signals, and if the signals installed do not conform with the coordinated facts, they may prove an obstacle to rapid traffic movement.

Authorities have agreed that the street space now available is not used to best advantage and that economic losses result from the unnecessarily retarded traffic movement. Streets are constructed for moving traffic, so that their use for storage purposes should be allowed only when such use does not interfere with traffic. In some cases adequate relief will be secured through the prohibition of parking during peak traffic movement. On the very busiest thoroughfares it may be necessary to prohibit parking entirely during the day. This may arouse opposition among merchants and automobile owners and an educational campaign may be conducted to show the advantage of a parking prohibition.

Cars can be operated with safety at higher speeds when regulations protect street car arteries from sudden intrusions of cross-street traffic. The boulevard stop plan, requiring all traffic to come to a complete stop before entering certain thoroughfares, gives this protection.

The loading and unloading of passengers is a factor in this phase of the problem which offers great opportunity for time saving. Wherever possible, passengers should be induced to buy tickets or tokens in quantities. This practice could be encouraged through publicity and by allowing a sufficient differential between the cash and the token or ticket fare. Some properties are using the pass in various forms. It has been found to be an agent for expediting movement of passengers through the elimination of cash and transfer transactions between operator and passenger. Motormen on two-man cars can sometimes be utilized to inspect passes and collect fares.

If increased speed is to be obtained, it is essential that all parts of the car should be designed to contribute to the rapid handling of passengers. The feasibility of reducing number of doors, as has been done in several instances, is also worthy of attention. The overemphasis on safety is particularly noticeable in the case of door operation.

It is believed that more light-weight, strictly modern cars, more power, and better maintenance are necessary to enable the railway industry to maintain its position or win back its lost ground. Ample motor capacity with the proper gear ratio to enable a car to keep in place in the fast moving traffic at all times is essential. Cars should be equipped to accelerate at least as rapidly as automobiles. To maintain high speed between stops brakes must provide rapid retardation. Automatic switches should be installed wherever possible and hand signals should be replaced by automatic signals.

Car operators must be trained to take advantage of every opportunity for rapid operation if full opportunities of increased speed are to be realized. The platform men are the salesmen of the railway industry, the mediums through which personal contacts between the public and management are made possible. No company can hope to render the best type of street car service unless it has a well-trained, interested, and enthusiastic corps of trainmen. If the sale of rides is as vital a matter as it is believed to be and the selling of these rides depends upon the ability and zeal of trainmen, then the industry is face

Adrian Hughes, Jr.
Bus Operation

Ralph W. Emerson
Traffic and Safety

W. E. Wood
Service Betterment

Chairmen of T. & T. Association Committees

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to face with the problem that educators have been struggling with since education became an organized effort—that of transmitting the necessary facts to the men on the cars and making those facts understandable to them in the light of their experience.

The report was signed by A. C. Spurr, J. L. Alexander, A. J. Boardman, J. F. Craig, L. J. DeLamarter, C. H. Evenson, D. L. Fennell, L. C. Datz, D. J. Graham, J. H. McClure, Joseph R. Ong, E. A. Palmer, D. A. Scanlon, D. A. Smith, Charles H. Strong, J. C. Thirlwall, W. E. Thompson, Claude L. Van Auken, C. W. Wilson, W. E. Wood, chairman; R. N. Graham, sponsor, and Paul E. Wilson, sponsor.

Traffic and Safety

FOR general convenience the work of the committee on traffic and safety has been divided into four subjects: (1) Men and their accident tendencies; (2) uniform classification of accidents; (3) standardization of street signs, signals and markings, and (4) speeding up traffic with safety.

In dealing with the first subject the committee finds that there are in street railway service a certain number of accident-prone men, whose accidents are not reduced by general safety methods. Accident-proneness may be regarded as something in the nature of a disease which has to be diagnosed and treated. The first step in treating a man is to find out why he has accidents. In the treatment of these accident-prone men psychological study can be of the most assistance, partly because these men obviously have some difficulty in doing their work and partly because the usual safety methods do not greatly affect the number of their accidents. The treatment of these men must make use of the company organization. Except for certain men the method to be pursued is special training which should consist in turning them over to the supervision of an instructor who rides with them in the daily routine of their work, showing them in what respect their operation is faulty and how to improve it so as to avoid accidents.

Selection of operators in street railway companies at the present time seems to be capable of considerable improvement. The usual procedure consists in an interview of the applicant by the superintendent of employment, tests of sight and hearing, and a medical examination, together with a check-up on previous record. It is the opinion of the committee that tests for the selection of new men should be based on experience obtained in dealing with high accident men already in the service. The tests which are found helpful in showing up the factors which cause the accident-proneness of these men could then be used in the selection of new operators.

Summarizing, the committee believes that in order to deal fundamentally with their accident-prone men street railway companies should:

1. Study their men's records and pick out and set aside for special treatment their accident-prone men.

2. Develop and organize some system for following-up new men and supervising the older employees with special emphasis on the aspects of operation which affect the safety and comfort as well as the convenience of passengers.

3. Combine under one division of personnel the work of selecting, training, follow-up, supervision, etc., so that the treatment of men may be consistent and continuous.

For purposes of comparison the committee, as have former committees, recommends the classification of accidents as recommended in the 1916 report. This classification can be subdivided to suit local conditions without affecting the general scheme.

The work of the National Conference on Street and Highway Safety disclosed the fact that a service of major importance could be rendered by the further development of a greater uniformity in state traffic signs, signals and markings. The committee recommends that the committee for the ensuing year concern itself with following the work of the national conference to the ultimate adoption of certain standards.

In the matter of speeding up traffic with safety the committee finds that in general there has been little improvement in abolishing the parking evil, which continues to be the greatest source of slowing down service and causing traffic congestion. When downtown merchants come to a better understanding of the stagnation of business caused by traffic congestion and the extent to which traffic tie-ups encourage decentralization of shopping areas they will reverse their present attitude and become the leaders in having downtown parking restricted.

The report was signed by H. O. Allison, A. W. Brohman, H. H. Dartt, John A. Dewhurst, S. E. Emmons, Charles H. English, A. J. Fink, Arthur Gaboury, Wm. W. Holden, R. J. Lockwood, E. K. Miles, C. S. Slocombe, Clinton D. Smith, E. C. Spring, George B. Anderson, sponsor; W. H. Boyce, sponsor; Richard Meriwether, sponsor, and R. W. Emerson, chairman.

Bus Operation

STUDY of the economics of bus operation with a view to arriving at some definite method which could be recommended to member companies for application to their particular situation has been primarily the work of this committee.

It is the opinion of the committe that the transportation companies are apparently not securing the information which they should have to analyze properly the economics of either their bus or their railway operation. It seems to be accepted that if an enterprise is producing more than the average cost of operation, the route is showing a profit. Simple analysis will indicate this to be untrue. The functions of cost vary with the investment required to do the work on the given route, the schedule speed, the topography and the traffic characteristics of the route. As a rule, the average cost of operation will not give the necessary information.

It should be at once apparent that this can only be done by an accurate and continuous knowledge of the actual cost of each operation. Most of the data required are already gathered in connection with statistics ordinarily set up by operating companies for obtaining the usual average operating cost. It is necessary merely to prorate these costs upon the proper, practical units which determine their variation. The proration and the analysis of operating costs by classification should be determined in collaboration with the operating department head who is familiar with the effect of the several factors controlling these costs. This method requires that each item of cost as prescribed by the classification of accounts be prorated over each route or group of routes on the basis of three units instead of being averaged solely on the bus-mile unit. These three units are the "bus," the "bus-hours" and the "bus-miles." Any item which may be applied directly against a given route or group of routes can be so applied, and thereby increases the accuracy of the record.

After all charges are prorated over the various routes they are reduced to a cost per mile unit for each route for convenient comparison with revenue per mile or other statistics and for a comparison of costs between various routes.

The routes can then be grouped in any manner desired and can show the results on those lines which may be expected to be profitable, as separate from those lines which are operated from other considerations, and can thus furnish all the information necessary for the guidance of the policy of the company toward the community served in regard to fare rates, extensions, curtailment, etc.

It is the opinion of the committee that such a system can be worked out in a satisfactory manner; that it should be adopted by all railway companies for their bus operations; and it is recommended that this work be assigned to the committee on bus operation for the year 1928.

Everyone in the motor bus industry recognizes the tremendous improvement achieved in recent years in chassis and motor design. Simplicity of construction, the accessibility and interchangeability of parts have been sought for and largely attained. Much has been accomplished also in the field of body design. Body lines and exterior finish, the interior arrangement and finish, all show a great deal of thought and artistic feeling. The seats and their upholstery, the ventilation and lighting, have all been tremendously improved.

While recognizing that there will always be specific matters which individual companies and operators may want to have incorporated into the body design of the vehicle which they purchase and, further, that certain of the improvements desired may tend to increase the cost of the vehicle, nevertheless, the conclusion has been reached that there is yet a wide field of study in bus body design which the manufacturers should undertake in co-operation with the engineering and operating members of the association, either

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through the medium and with the co-operation of the existing committee or through the creation of a special committee to consist of operators, engineers, and manufacturers.

Simplicity of body construction, accessibility and interchangeability of parts are important. When a body panel is dented, it is desirable that it can be replaced quickly. Similarly, should a roof be dented, it is desirable to be able to repair it without ripping out a great deal of the interior finish. It is felt that more thought should be given these matters when the body is being designed.

The report was presented by B. W. Arnold, C. H. Chapman, J. C. Johnson, C. F. Kells, J. J. Mangan, M. G. Moore, T. W. Noonan, E. S. Pardoe, J. M. Penick, M. W. Rew, Leo Reynolds, A. Shapiro, J. L. Smith, C. W. Stocks, A. T. Warner, H. G. Weeks, Adrian Hughes, Jr., chairman, W. H. Boyce, sponsor, F. L. Butler, sponsor, and Samuel Riddle, sponsor.

Safety

STATISTICS on accidents of member companies were compiled for the years 1926 and 1927. Among the city companies from 60 to 70 reported. The figures in 1927 for these companies show in comparison with 1926 a decrease of 2.21 per cent in the total number of accidents, an increase of 9.62 per cent in total number of persons injured, a decrease of 38.24 per cent in passenger fatalities, a decrease of 0.14 per cent in total cost of claims, an increase of 5.14 per cent in cost of safety work. Other data were given, as well as corresponding statistics for interurban companies.

A digest was published of the principal factors in safety work as outlined by the seven companies in competition for the 1927 Brady Award.

A statement was included by the ex-registrar of motor vehicles in Massachusetts on the compulsory insurance law in that state. This law was passed not as a safety measure but to compel the operators of all motor vehicles to be financially responsible if they should injure or kill someone. The law has been very helpful in increasing safety. Before it went into effect probably two-thirds of those causing injuries were financially irresponsible. It discouraged the purchase of automobiles by persons who could not afford them and had the effect of keeping imperfect passenger cars and trucks off the road.

A summary of the laws of several states were given as to the liability for injuries caused by operators of "drive-it-yourself" cars. In New York and Rhode Island the owner is liable by statute. In New Jersey it is customary for the owners to arrange with the operator that the latter assumes the damage up to $100, and the owner above that amount. In Illinois it is customary for the owners to carry insurance. In the other states reported on, the operator only is generally responsible except when an accident occurs because of a defect in the machine.

The effect of the clause of the new Pennsylvania vehicle code prohibiting on highways advertising signs erected by private individuals was commended. All companies were requested to urge legislation requiring the licensing of drivers, and restricting parking in congested districts.

Companies were urged to co-operate with schools, automobile associations, boy scouts, safety patrols and similar organizations in the safety movement.

Attention was called to progress in the reduction of dangerous grade crossings, progress in the standardization of highway signs and the wide variation of the laws in different states as to the minimum age for a driver's license.

The report was submitted by Ancil D. Brown, H. E. Cady, J. R. Compton, R. H. Ferguson, J. W. Giltner, George H. Ingles, A. G. Jack, P. W. Klabunde, Trevor C. Neilson, John M. Orts, John J. Reynolds, and H. K. Bennett, chairman.

A collect on delivery service in connection with the despatch freight business was first extended locally by one of the Ohio lines early in 1927. The service proved popular.

C.O.D. service has recently been extended to interline, despatch freight business in C.E.R.A. territory. Accounting forms and methods are very similar to those used in the handling of local business. It is necessary of course to use an interline form of waybill providing space for C.O.D. and return charges. Extra copy of waybill is made by billing agent and forwarded by the Auditor of originating carrier to Auditor of destination carrier for checking purposes. The return charges or collection fees are reported by destination carrier on abstract of interline despatch freight waybills received in a separate column, and the total prorated for the present on a basis of 50 per cent to the originating and 50 per cent to destination carrier. This amount is reported in interline statement at end of month and included in draft settlement. The question of division of the collection fees has not been definitely settled.

W. F. Weh, Editing — J. R. NcNary, Subjects — H. K. Bennett, Safety

Chairmen of Claims Association Committees

Freight Accounting

ELECTRIC railways located in Central Electric Railway Association territory recently arranged for an interchange of freight with the steam railroads in the Southern Freight Association territory. Freight can now be billed through from points in eastern Pennsylvania, Ohio, Indiana, Michigan, Illinois and Kentucky to any point south of the Ohio and east of the Mississippi River served by a steam railroad. This connection places the electric railways in a much better position than heretofore.

The accounting in connection with this interchange of business is governed by the Railway Accounting Officers Association rules, which have been adopted by the Central Electric Railway Accountants' Association in so far as they are applicable to electric railway freight accounting methods. The adoption of the R.A.O.A. rules is regarded as one of the outstanding achievements of the C.E.R.A.A. during the year.

A despatch freight express service, without pick up or delivery, has been conducted on passenger cars of practically all interurban railways for a number of years. The rates for this service are 1½ times the first class freight rate.

The Electric Railways in C.E.R.A. territory are proposing to meet truck competition by offering a like service under certain conditions. A pick-up and delivery service will be given in cases where the tonnage received from one consignor or for delivery to one consignee, in one day, in a single transaction (as the case may be), equals a fixed minimum number of pounds and the revenue from which will equal a minimum number of dollars. The minimum weight and revenue on freight classified under official classification as first, second, third or rule 25 classes or higher will be less than that required for freight classified under rule 26 fourth and fifth classes. On mixed freight, the requirement will be based entirely on revenue and on the same amount as required for first, second, third and rule 25 classes. This service may also be extended to customers offering freight in less quantities than the minimum to be named, when specifically requested, the cost to be assumed by the customer.

The report was signed by F. I. Fleming, A. A. Healy, L. T. Hixson, A. E. Wafer and Walter Shroyer, chairman.

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News of the Industry

Washington Hearings Closed

Although the District of Columbia Public Utility Commission closed its hearings recently on the petition of the Washington street railway companies for a higher fare, it is not thought that a decision will be rendered until Congress convenes in December. It is believed that the commission will gain time by insisting on a revaluation of the companies so as not to be put in the position of granting a fare increase before Congress has had an opportunity of passing upon the merger agreement.

Despite the protests of the people's counsel at the hearings that a fare increase at this time would be prejudicial to the unification plan, officials of the companies contended that the relief should be as speedy as possible because there is no assurance that Congress will approve the merger at all. Should Congress decide to accept the merger, they point out, the agreement specifies that the fare in effect at the time approval is given shall revert automatically to the present rate and remain so for a year. George E. Hamilton, chairman of the board of the Capital Traction Company stated at the last hearing that his company was losing $40,000 a month on the present fare rate.

Although the commission has not made a recent and complete valuation of the Washington Railway & Electric Company, it has estimated this amount at $18,000,000. Its valuation of the Capital Traction Company in 1925 was raised by the company's petition to the courts from $20,756,880 to $25,756,880. As the holdings of the Washington Railway & Electric Company are greater than those of the Capital Traction Company, it is generally conceded that the former company could have its valuation raised without much difficulty by application to the courts. Even on these apparently low valuations, the companies are not making more than a 5 per cent return at present. The District courts have ruled that utilities are entitled to a 7 per cent return.

Recently the commission ruled that the Washington Railway & Electric Company must become a party to the Capital Traction Company's 10-cent fare application.

Fare Lowered on Georgia Line

A new 5-cent rate was recently created by the Georgia Power Company between Avondale and Decatur, a distance of approximately 1 mile. The reduction amounts to 3 cents. However, passengers still have to transfer at Decatur, which is the terminus of the Stone Mountain line and take the North Decatur car into Atlanta. It has been proposed that the company extend its South Decatur line to Avondale so as to do away with this transfer.

Ordinance Introduced in Philadelphia

People to decide on $139,000,000 underliers issue. Commission values properties at $138,376,907

AN ORDINANCE was introduced in the City Council of Philadelphia, Pa., on Sept. 20, authorizing a referendum at the November election to determine whether the city shall acquire the holdings of the underlying companies of the Philadelphia Rapid Transit system by means of a bond issue of $139,000,000. This followed the publication of a report by the Pennsylvania Public Service Commission, placing a valuation of $138,376,907 upon the 55 underlying companies. The ordinance as introduced provides that the issuance of loans is contingent upon a court ruling exempting the $139,000,000 as a charge upon the city's borrowing capacity, the necessary petition to be filed within three months after the voters have approved the project. If the Court of Common Pleas decides that the funds borrowed are chargeable to the borrowing capacity, the acquisition proceeding shall be dropped. It is the city's intention to issue municipal bonds in exchange for the holdings of the underliers, and by substituting itself in place of the underliers as lessor of franchise rights to the Philadelphia Rapid Transit, to effect an annual saving which has been variously estimated from $2,400,000 to $4,500,000.

Commission View of Underlier Matter

TO US the most far-reaching consideration is what will be the effect upon the car-riding public, whose interests has been confided to us by the Legislature, and its interests will necessarily be given first consideration.

The valuation proceeding by the Public Service Commission had its beginning at the request of the city on May 31 last, when the commission was asked to assess and determine the compensation to be paid by the city for its proposed condemnation.

The report covered the entire question of the condemnation of the street railway transit facilities and franchise of all the underlying companies forming the P. R. T. system. The report referred to the retention of experts to make a study of the Philadelphia Rapid Transit situation. This report, according to the commission, filed in March, served to analyze and present clearly for the first time the premises of the problem and the resultant public benefits.

The commission estimated that the total yearly carrying charges on the bond issue to pay for condemnation would be $7,403,170, which would mean a saving of $2,441,892 each year for the city, compared with the carrying cost of the property under present leaseholds, provided that 50-year serial type bonds were issued. The commission divided the underliers into five groups classified according to the rate of return on investment to reach its total of the valuation of $138,376,907. This figure is $2,000,000 more than the estimated valuation of Charles C. McChord, public utilities expert. The valuation set by the underlying companies is $151,000,000.

No Nearer Settlement in Tacoma

The City Council of Tacoma, Wash., recently voted unanimously to reject the terms of the net franchise which had been outlined by S. M. Jackson and associates as necessary for a new Tacoma company which he proposed organizing to take over the properties of the Tacoma Railway & Power. Mr. Jackson had already informed the Council that he could not proceed further if the terms were not satisfactory, that he had not expected to make a dollar in the deal, and was acting in an effort to clean up a matter important to the progress of the city.

Receivership for the Tacoma Railway & Power Company was expected by city officials to follow the failure of the negotiations with Mr. Jackson. The Puget Sound Electric Railway, holding company for the Tacoma Railway & Power Company, is already in receivership, and holders of defaulted first mortgage bonds of the latter are said to be ready to foreclose.

In its motion to reject, the Council first expressed its appreciation of Mr. Jackson's efforts. It not only declared the proposed franchise terms not for the best interests of Tacoma, however, but stated that it was not going to discuss a franchise with anyone except a company in possession of the means for furnishing transportation for the city of Tacoma. Mr. Jackson's organization had not been formed and his associates were not known.

The franchise terms to which objection was made were: No gross earnings tax to be paid until after reasonable return on the rate base valuation and after depreciation: no free rides for city employees, and other provisions.

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Cleveland Heights Ordinance Provisions Heard

Settlement of another suburban street railway franchise in the Cleveland, Ohio, metropolitan district appeared probable recently when a service-at-cost ordinance was given its first reading at a meeting of the Cleveland Heights City Council. It proposes to give the Cleveland Railway a rate of fare similar to that fixed for East Cleveland by a board of arbitrators. This is a sliding scale, at present 2 cents higher than the Cleveland rate, rising or falling as the Cleveland rate changes. The Cleveland Railway agrees to make rail extensions of all three of the Cleveland Heights lines and to operate through service to Public Square. Coach regulation and routes are left to subsidiary agreements to be enacted by the Heights Council, subject to the approval of the Cleveland Council.

The rate of fare specified in the existing Heights franchises is 5 cents. For three years, however, Heights riders voluntarily have been paying the Cleveland rate of fare in the hope of getting extensions. Following the recommendations made by the Metropolitan Transportation Commission, the Heights offered to pay 1 cent more than the Cleveland rate of fare in return for the extensions, but the Cleveland Council rejected a franchise on this basis, contending that the differential should be 3 cents.

The new ordinance was prepared after about three years of wrangling between the Cleveland and the Heights Councils. With the passage of the Heights ordinance embodying what amounts to a 2-cent differential, Lakewood will be the only major Cleveland suburb outside of the service-at-cost provisions of the Tayler grant.

Higher Fare Sought in Beloit

A petition to increase fares from 7 cents to 10 cents has been presented by the Beloit Traction Company, Beloit, Wis., to the Railroad Commission. Testifying recently before that body, J. M. Ellis, head of the company, asserted that service during the last year had been furnished to patrons at less than cost.

High Wage at Port Arthur and Fort William

The unanimous award of the Board of Conciliation, acting in the matter of the street railway men's dispute between the employees and the Public Utilities Commission of Fort William and Port Arthur, Ontario, lays down a higher wage scale for the men. Car operators of more than one year's seniority are to receive 62 cents an hour for an eight or ten-hour day, an increase of 4½ cents an hour. An increase of 2½ cents an hour is recommended for new operators for the first six months, or 52½ cents and 57½ cents an hour for the second six months, or 2 cents more than the old rate. Corresponding increases are suggested for men in the carhouses.

This scale is to be operative from May 1, 1928, to May 1, 1930.

Wage Increase in Boston

Eastern Massachusetts men win 3 cents an hour in arbitration proceedings. F. A. Cummings issues dissenting opinion

An increase in wages for carmen employed by the Eastern Massachusetts Street Railway, Boston, Mass., has been awarded by the special arbitration board. It amounts to 3 cents an hour, and will date back to last May and continue in force a year. The extra cost to the road is computed at $126,000 a year. The vote of the arbitration board on the question of wages was two to one, as Fred A. Cummings, who represented the company, dissented. James J. Kerwin of Lowell, who was chairman, and James H. Vahey, representing the men, voted for the award.

The board of public trustees met immediately after the award had been announced, but took no action.

Other decisions of the arbitration board were adverse to the carmen. The union had demanded a larger differential in favor of operators of one-man cars; this was denied. The board declined to re-establish the seniority that was taken away by the State Board of Conciliation in 1921. The men's demand that two men be employed on each tractor and on electric cars with snow scrapers attached was denied. Certain questions of discipline were decided in favor of the company. The union sought to compel the company to submit reports in writing to employees against whom complaints were made, before the employee would be obliged to make any comment thereon. This demand was also refused by the board of arbitration, which decided that the company ought to have the right to designate officers to deal with the employees on all questions which arise involving breach of rules.

Vice-president Cummings in his dissenting opinion alleged that from 1923 to 1928 the employees had their wages increased 12½ cents an hour besides being given time and a half rates for work performed after eight hours, and that today they are receiving 8 per cent more in wages than in 1920, although according to the Massachusetts commission on necessaries of life, the cost of living is 20.8 per cent less than in 1920. In this connection he said:

"These facts naturally bring one to a query as to where and how this arbitrary wage raising at the expense of the company and the public is going to end."

Mr. Cummings believed the increase threw an unjustifiable burden upon other wage earners who were car riders on the railway system. It was inevitable that the award would ultimately work out to the distinct disadvantage of the employees and that it would necessitate increased fares in practically every operating district throughout the system. He was sure it would lead to the discontinuance of certain railway and bus lines which could no longer stand the pressure of almost annual increases in wages. He compared the lot of the Eastern Massachusetts railway workers who "are enjoying steady employment" while thousands of men and women in the textile cities and towns under many handicaps are struggling.

On the financial status of the company his statement follows:

Evidence submitted by this company shows that our gross revenue from all sources for the six months ending June 30, 1928, was approximately $205,000 less than for the six months ending June 30, 1927.

Further evidence shows that our gross revenue from all sources for the year ending June 30, 1928, was approximately $400,000 less than for the year ending June 30, 1927.

Concluding his protest Mr. Cummings stated:

There was no dispute during the hearings before this board of arbitration that the company officials have strained every effort and have acted intelligently and efficiently in reducing expenses and would be confronted by a stupendous task in proceeding further along those lines in the event of any additional burden being placed upon the company.

Compromise Sought by Columbia's Mayor

The transportation situation in Columbia, S. C., more or less acute since March, 1927, when all street cars were driven into the carhouse where they have remained since, has again been occupying front page space in the South Carolina capital and bids fair to draw much comment. Mayor L. D. Owens, impatient at the delay, and seeing nothing advantageous in further litigation, has proposed that the city and the Broad River Power Company reach a compromise. He proposed to the Columbia City Council that an agreement be entered into whereby the power company turn over to Columbia its equipment, consisting of cars, tracks, wires and so forth and in addition that the power company pay the city a certain amount of money—the sum of $200,000 has been tentatively mentioned. This money would not be used by the city to operate the street cars, but the street car equipment would be offered to some company as an inducement to operate the system. To this same company would be given a franchise to operate street cars and bus lines, so that the two modes would function co-operatively and not competitively.

The compromise suggestion has been discussed in the City Council and other propositions looking toward a solution have been advanced.

Recently W. S. Barstow of New York, head of the utility company, was in Columbia and said that his company had made no offer of any sort of compromise and had no intention of making any.

Meanwhile the decision of the Supreme Court approving or rejecting the appointed referee's report is being awaited.

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Hearings Held on Chicago Elevated Injunction

Charges that suburban passengers were riding over the elevated lines at less cost than residents of Chicago were made recently by Congressman Frank L. Reid, special counsel for the city of Chicago, opposing the railroad's application for a permanent injunction restraining the Illinois Commerce Commission from enforcing its order denying a 20 per cent increase in elevated fares. Hearings on the application are being held before Federal Master in Chancery Roswell B. Mason, who was appointed to hear the evidence after the federal court had granted the company a temporary injunction last July. Congressman Reid further charged that if the elevated system was receiving a proper return from its track leases to the Chicago, North Shore & Milwaukee and Chicago and the Aurora & Elgin Railroads, an advance in rates would not be necessary.

Replying to this attack, Harry A. Dumbaugh, attorney for the Chicago Rapid Transit Company, insisted that the leases in question had been approved by the Illinois Commerce Commission and argued that they could not be made an issue in the present case.

Charles A. Thompson, vice-president of the Chicago Rapid Transit Lines, testified that the cost of operation has been increasing constantly and that the present wage scale and cost of materials indicate that operating costs in the next two or three years will not be less and probably will be more than during the last four or five years. Attorney Reid contended that many items that should go into capital account have been placed under operating expenses and that maintenance figures are out of proportion to what should be allowed.

Following vice-president Thompson on the stand, John Seymour, auditor of the company, was summoned to identify figures on operating and maintenance costs. One of the contentions of the company in seeking to have the injunction made permanent is that it needs an increase of $815,000 a year for its maintenance account.

Date Set for St. Louis Wage Hearing

The Missouri Public Service Commission has set Oct. 3 as the date for opening the hearing on the wage dispute between the St. Louis Public Service Company, St. Louis, Mo., and the street carmen's union. Jointly the company, union and city of St. Louis asked the commission to arbitrate the wage question. The hearings will be held in the City Hall, St. Louis.

The union had asked increases ranging from 5 cents upward and that the top scale for carmen be reached within one year instead of three years as at present. Also improved working conditions, including time and half for all overtime, instead of time and one-fourth as at present. Originally the company requested that the men accept an average decrease in pay of 8.42 per cent, but later withdrew this proposal.

McGraw-Hill Effects New Merger

Affiliation of the Bragdon, Lord & Nagle Company, publisher of *Textile World,* oldest business paper in its field, with the McGraw-Hill Publishing Company has been announced by James H. McGraw, president of the latter organization. The consolidation adds a new and important division to the McGraw-Hill organization and increases its business, industrial and engineering publications to 23. In addition to *Textile World,* which was established in 1868, three years after the Civil War, the merger includes the Consolidated Textile Catalog, *Textile Advance News,* Official American Textile Directory, the American Knitting Trade Directory, and a group of technical books devoted to the textile industry.

Affiliation of the Bragdon, Lord & Nagle Company with the McGraw-Hill organization marks the second large-scale development to be effected by the latter company within three months. On June 29, Mr. McGraw announced a merger with the A. W. Shaw Company of Chicago which, as a division of the McGraw-Hill Company, is the publisher of the *Magazine of Business,* devoted to the general executive interests of all business, and of *System.* In addition to the broad sweep of business, the McGraw-Hill publications cover the fields of metal mining, coal, the electrical industry, food manufacture, industrial management, power, electric railway and bus transportation, machine tools, civil engineering and heavy construction, radio and chemical engineering. The *Textile World* covers the major branches of its field—cotton, wool, silk, rayon, and other fibers; the knitting industry, and bleaching, dyeing and finishing.

Recent Bus Developments

Humanitarian Work by C. E. Millen Rewarded in Washington

In recognition of extraordinary devotion to duty during the severe storm that struck Washington, D. C., recently, Calvin E. Millen, bus operator of the Washington Railway & Electric Company, was awarded $200 in gold by the directors of the company. President William F. Ham, in presenting the money to Millen at the last safety meeting of the company, stated that in all his experience he had never heard of a greater performance of service than operator Millen gave to the nineteen women entrusted to his care.

He was the operator of a special bus in which nineteen members of the Washington Sodality Union were returning to the city from southern Maryland. He investigated before crossing bridges. Soon, however, a bridge behind being swept away, he and his nineteen women passengers were marooned on a temporary island for two days and a night. During this time he tried by every means possible to arrange for rescue, walking miles to reach a telephone line and procuring blankets from neighboring farmhouses.

After arriving back in Washington these women showed their appreciation for Mr. Millen's services not only by singly and collectively commending him to his superiors, but also by presenting him with a purse of $20.

Chicago Ordinances Repassed Over Mayor's Veto

BY A VOTE of 39 to 6 The Chicago City Council repassed the ordinances providing for feeder bus service by the Chicago Surface Lines. Mayor William Hale Thompson had vetoed the ordinances recently and the Illinois Commerce Commission denied the right of the surface lines to purchase the buses. The commission held that it was illegal for the company to operate buses. This is in direct opposition to the opinion of the commission a year ago when a similar order was given to establish the feeder service on Diversey Avenue.

Alderman Joseph B. McDonough, chairman of the committee on local transportation, will urge the Chicago Surface Lines to buy the buses and begin operation. The company has expressed a willingness to buy the buses and begin operation in order to give the needed service.

New Service for Alameda Authorized

The Key System Transit Company, Oakland, Cal., was recently authorized by the California Railroad Commission to abandon its franchises, tracks and service on four lines in the city of Alameda. The lines affected are the Haight Street bus line and the High Street, San Jose Avenue and the Santa Clara Avenue car lines. Permission was made subject to the condition that a bus line be operated in Oakland and Alameda as an integral part of the Key System and with all the transfer privileges now in force on the present car lines. Also that the company remove rails, ties, overhead wires and other equipment from the streets of Alameda over the routes abandoned within six months of the effective date of the commission's order and place the streets in the same condition as the remainder of the street. In its decision the commission said that this operation was largely experimental

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and that there should be co-operation among officials of the company, the people and city officers.

Suggest Buses for Annapolis

Removal of the cars of the Washington, Baltimore & Annapolis Electric Railroad from the streets of Annapolis, Md., has been suggested to officials of the company by the Annapolis authorities and is now under consideration. The city officials also suggested that the company substitute bus service through Annapolis in place of the cars. Lines of the south shore branch of the company now travel through the city. It is claimed by the municipal authorities that the heavy cars interfere with traffic.

Substitution on East St. Louis Line

G. W. Welsh, vice-president of the East St. Louis & Suburban Railway, East St. Louis, Ill., has announced that effective Oct. 15 railway service will be discontinued between Edwardsville and Collinsville and between Collinsville and Edgemont. The Illinois Commerce Commission has authorized the substitution of buses, which will operate from Edwardsville to Edgemont.

St. Louis Rides Buses

The number of revenue-passengers hauled during August by the St. Louis Public Service Company, St. Louis, Mo., showed a decrease of 5.13 per cent compared with a similar month in 1927. Records disclosed that in August, 1928, but 79 per cent of the number of passengers hauled in August, 1925, used the company's street cars. Passenger revenue for August was $1,546,003, an increase of $7,185, due to the increase in fares from two tokens for 15 cents to 8 cents straight. In August, 1928, some 19,695,555 revenue passengers were hauled, compared with 20,760,233 in August last year. Average Sunday revenue on street cars this August was $35,586 against $33,341 last August. This gain of $2,245 per Sunday is due to the popularity of the 25-cent Sunday pass, 40,000 being sold each Sunday.

The St. Louis Bus Company, subsidiary of the car system and operated by the St. Louis Public Service Company, increased its business 63 per cent for the month, carrying 733,623 revenue passengers as against 461,240 in August of last year, a gain of 272,383. Bus revenues totaled $31,408 for August this year and $12,164 for August, 1927, while the increase in revenue passengers was 59.05 per cent.

The bus figures are the fares paid on the buses and do not include those passengers who originate on street cars and later transfer to buses. The increase in bus travel is due to the decrease in fare from 10 cents to the same rates charged by the street cars along with free interchange of transfers. Bus traffic to the Municipal Opera increased 25 per cent over 1927.

Financial *and* Corporate

South Shore Readjustment Plans Projected

New management petitions for permission to issue securities for retirement and extension purposes. Rehabilitation work reviewed.

THE first step in the readjustment of the financial structure of the Chicago, South Shore & South Bend Railroad was taken Sept. 19, when petitions asking approval of new securities were filed with the Public Service Commission of Indiana, and the Illinois Commerce Commission. Authority is asked by the South Shore Line to issue the following securities and sell them at prices which will yield $8,150,000 for the company. They are:

$1,000,000 first mortgage 6 per cent three-year bonds.

$1,500,000 par value 6½ per cent class A preferred stock.

$3,500,000 par value 6½ per cent class B preferred stock.

265,000 shares of common stock without par value.

It is stated in the petition that the money raised by the sale of these new securities will be used to reimburse the company's treasury for the retirement of old bonds aggregating $4,000,000, and for capital expenditures made for additions, extensions, and improvements in the property since July 14, 1925.

In the petition filed with the Indiana commission, the railroad, being an Indiana corporation, asks for authority to amend its articles of association, increasing its authorized capital stock to 600,000 shares of common stock of no par value, and $6,000,000 of preferred stock, consisting of 60,000 shares with a par value of $100 each.

The securities retired are $2,000,000 of first and refunding mortgage 30-year 6½ per cent gold bonds, $250,000 second mortgage 50-year 6 per cent gold bonds and $1,750,000 adjustment mortgage 50-year gold bonds. These were authorized by the commission in 1925 at the time of the purchase of the railroad and have recently been re-acquired, cancelled and retired in order to clear the way for the new plan of financing.

The Chicago, South Shore & South Bend Railroad acquired the old Chicago Lake Shore & South Bend Railroad on June 29, 1925, at a receivers' sale conducted by the United States District Court at Michigan City. The railroad had gone into receivership in February, 1925. The present South Shore line is one of the subsidiaries of the Midland Utilities Company of Chicago, which owns the Gary Railways, Shore Line Motor Coach Company and a number of other public utility properties in northern Indiana and Ohio.

A comprehensive rehabilitation program has been carried on. New steel passenger cars have been placed in operation and freight service has been improved by the purchase of new electric locomotives. The railroad was completely re-electrified in 1926.

Improvements included the laying of several miles of track, construction of passenger and freight stations and remodeling old ones and the introduction of dining and parlor observation cars. Increased headway was effected between South Bend and Chicago and between Gary and Chicago.

Favorable Showing in Kansas City

During the first week in September, for the first time this year, the report of the Kansas City Public Service Company shows an increase in street car patronage. During that week 1,995,332 passengers paid $148,452 in fares compared with 1,987,157 passengers and $148,043 in fare during the corresponding week in 1927. Although tram receipts increased, the buses during their last week at the 15-cent rate showed a 25 per cent decrease over a similar week last year. No figures are available as yet on the new two for 25-cent bus fare which went into effect on Sept. 15.

Easy Payment Plan for Public Service Preferred

Another opportunity to buy public Service preferred will be given on Oct. 1, when the Public Service Corporation of New Jersey will sell to customers its $5 cumulative preferred stock, no par value, for cash or under the popular ownership plan of partial payments. The price is $100 and accrued dividends per share, or $10 down and $10 per month. Installments will draw interest at the rate of 5 per cent per annum. Public Service Preferred has been offered under a customer-ownership campaign since October of last year.

Motorman Connolly an Interborough Director

Patrick J. Connolly, president of the Brotherhood of Interborough Rapid Transit Company Employees, was elected a director of the system on Sept. 26 at the annual meeting of the company's stockholders. He fills a vacancy on the board. Other directors were re-elected.

In a statement issued after the meeting, Frank Hedley, president of the company, declared that Mr. Connolly's election was the fruition of a policy of allowing employees first-hand representation in the company's affairs.

Mr. Connolly, who is 42 years old, has headed the Interborough Brotherhood since 1919. For many years an employee of the company, he is at present a motorman on the Sixth Avenue elevated line.

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New Director of B.-M. T.

Fred C. Marston, secretary and treasurer of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., was elected a director on Sept. 17 to succeed George S. Franklin. Mr. Franklin became a director of the company upon its organization, in July, 1923, as a representative of the stockholdings of the War Finance Corporation in the company. The War Finance Corporation has since been liquidated and Mr. Franklin felt that he should retire from the board because it no longer represented a group holding a substantial interest in the company.

Purchase of Small Line by Associated Gas & Electric

The Calais Street Railway, reaching the towns of Calais and Milltown, Me., and Milltown and St. Stephen, N. B., Canada, was purchased recently by the Associated Gas & Electric Company. Complaints had been registered by the new owners to the New Brunswick and Maine Utilities Boards stating that the railway was selling power in its territory. The railway operated 8 miles of single track.

Receiver's Account Approved

Stockholders of the subsidiaries of the New York Railways, New York, N. Y., have approved and accepted the account of Hugh J. Sheeran, as receiver of the New York Railways, filed on July 11, showing the allocation of earnings of the receivership period. They also approved and authorized an operating agreement between the respective companies and the New York Railways to be dated as of Jan. 1, 1928, and to provide for the operation of the property.

The companies which held special meetings were the Sixth Avenue Railroad, 42nd Street & Grand Street Ferry Railroad, 23rd Street Railway, 34th Street Crosstown Railway, Christopher & Tenth Street Railroad, and the Bleecker Street & Fulton Ferry Railroad.

Stroudsburg Property for Sale

After more than 50 years of operation by horses, steam dummy and finally by electric power, the whole property of the Stroudsburg Traction Company is being scrapped by the bondholders. Twelve miles of track, including the scenic Delaware Water Gap line, has been abandoned.

Buses have been gradually replacing the cars for the past three years. Three Garford buses are in operation, with two other types as spares. The fare charged is 10 cents and the bus operation is successful, but only about one-third the gross business is done with buses now, compared with the business done in the same territory five or six years ago with the electric cars. The bus operation is conducted under the name of the East Stroudsburg Bus Company, which is owned by the bondholders of the old railway company, but the business is for sale in order to close up the affairs of the traction company.

Michigan Road to Go at Auction

The property of the Grand Rapids, Grand Haven & Muskegon Railway, serving a territory in Muskegon County and northern Ottawa County out of Grand Rapids, Michigan, will be sold under a mortgage foreclosure on Oct. 25 under the direction of Kirk E. Wicks, master in chancery. Certain properties, including land released from the mortgage, will not be sold.

Operation of this line ceased on April 18, less than a month after Federal Judge F. M. Raymond in United States District Court in Grand Rapids signed an order ending the life of the railway on petition of the Guaranty Trust Company, New York. This petition asked that the Grand Rapids Trust Company, which had been receiver since July 31, 1926, be authorized to end its endeavors to put the road back on a paying basis. The Guaranty Trust Company was trustee for holders of $1,500,000 in bonds, upon which interest amounting to $75,000 annually had been defaulted for a year prior to the receivership.

Following the cessation of the interurban service various bus applications were presented to the State Utilities Commission. After much agitation a deal was closed by commission order whereby the Greyhound Lines took over the buses and route of the interurban company known as the Lake Line Company.

Slight Decline in Brooklyn City Income

For the two months' period ended Aug. 31, 1928, the passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., was $1,778,639, compared with $1,778,445 for a similar period of 1927. After the consideration of operating expenses, taxes and income deductions the net corporate income was $92,566 for the 1928 period compared with $118,100 for the 1927 two months' period.

Dismisses Receivership Suit of Indianapolis & Cincinnati

The petition of Fred H. Kelly of Peoria, Ill., to dismiss his suit for receivership of the Indianapolis & Cincinnati Trust Equipment Company, has been granted in Federal Court in Indianapolis. In the petition it was stated that the new owners of the Indianapolis & Cincinnati Traction Company, of which the defendant firm was a subsidiary, had bought the stock of the equipment company at prices suitable to the plaintiff, who held shares.

Hudson & Manhattan Issue Approved

Issuance of $5,631,000 in common stock of the Hudson & Manhattan Railroad has been approved by the New Jersey Board of Public Utility Commissioners. The proceeds will be used to refund other securities.

Conspectus of Indexes for September, 1928

Compiled for Publication in ELECTRIC RAILWAY JOURNAL by

ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Last 5 Years High	Last 5 Years Low
Street Railway Fares* 1913 = 4.84	Sept. 1928 **7.65**	Aug. 1928 **7 65**	Sept. 1927 **7.53**	Sept. 1928 **7.65**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	Sept. 1928 **144.2**	Aug. 1928 **142.5**	Sept. 1927 **141.6**	April 1923 **175.3**	Feb. 1928 **139.5**
Electric Railway Wages* 1913 = 100	Sept. 1928 **229.7**	Aug. 1928 **229.7**	Sept. 1927 **228.0**	Aug. 1928 **229.7**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Sept. 1928 **204.4**	Aug. 1928 **204.5**	Sept. 1927 **199.4**	March 1924 **206.8**	Jan. 1923 **187.3**
Eng. News-Record Construction Cost (General) 1913 = 100	Sept. 1928 **207.3**	Aug. 1928 **207.3**	Sept. 1927 **203.6**	March 1924 **224.7**	Nov. 1927 **202.0**
U.S. Bur. Lab. Stat. Wholesale Commodities 1926 = 100	Aug. 1928 **98.9**	Julv 1928 **98.3**	Aug. 1927 **95.2**	March 1925 **104.8**	April 1927 **93.7**
Bradstreet Wholesale Commodities 1913 = 9.21	Sept. 1928 **13.28**	Aug. 1928 **13.19**	Sept. 1927 **12.90**	Dec. 1925 **14.41**	July 1924 **12.23**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Aug. 1928 **154.2**	July 1928 **152.8**	Aug. 1927 **152.4**	Nov. 1925 **167.1**	May 1924 **141.0**
Cost of Living Nat. Ind. Conf. Bd. 1914 = 100	Aug. 1928 **161.4**	July 1928 **161.1**	Aug. 1927 **162.0**	Nov. 1925 **171.8**	Feb. 1923 **157.5**
Industrial Activity Elec. World—Kw.-hr. used 1923-25 = 100	Aug. 1928 **119.0**	July 1928 **120.2**	Aug. 1927 **110.6**	Feb. 1928 **127.7**	July 1924 **73.4**
Bank Clearings Outside N. Y. City 1926 = 100	Aug. 1928 **99.9**	July 1928 **100.7**	Aug. 1927 **99.5**	May 1928 **108.4**	Aug. 1923 **81.6**
Business Failures Number Liabilities (Millions)	Aug. 1928 1544 **35.49**	July 1928 1445 **31.11**	Aug. 1927 1448 **44.37**	Jan. 1924 2231 **122.95**	Aug. 1925 1353 **27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

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Personal Items

H. C. Cordell Heads Important Department at Highwood

Henry C. Cordell, whose election as chairman of the transportation section of the Wisconsin Utilities Association has been mentioned in ELECTRIC RAILWAY JOURNAL, is responsible as master mechanic of the Chicago, North Shore & Milwaukee Railroad for the operation of 523 cars which are run more than 13,000,000 miles a year. He has held this post since September, 1916. At that time the road was in a run-down condition and a complete rehabilitation program has been carried on for several years.

At the age of eighteen Mr. Cordell arrived from Sweden where he spent his early boyhood on a farm. He worked his way through a year in a technical school, and deciding that this country held better promise for him than his native land he went to Chicago in the fall of 1893. Soon the opportunity appeared to work as an apprentice in The Featherstone Foundry & Machine Shop, manufacturers of refrigerating machines and mining and marine repair machinery. His four-year apprenticeship gained for him a wide experience.

When the company dissolved in 1904, he went as machinist to the Chicago & Northwestern and on March 5, 1905, entered the service of the Chicago Rapid Transit Company as machinist foreman at the Wilson Avenue Shops. Five years later he was appointed master mechanic, where he remained until he was sent to Highwood.

He has been a member of the Wisconsin Utilities Association since 1920, and was appointed president of the A.E.R.A. company section in 1926.

P. J. Little Resigns

P. J. Little, formerly president of the Southern Cambria Railway, has resigned and Evan M. DuPont, president of the Johnstown Traction Company, is now president of the former company. The secretary and treasurer of the Southern Cambria Railway is now Joseph McAneny. These changes were effected when the controlling stock interest in the Southern Cambria Railway was purchased by the Johnstown Traction Company, Johnstown, Pa.

E. J. Mehren Honored

Edward J. Mehren, vice-president and editorial director of the McGraw-Hill Publishing Company, has been appointed editor of the *Magazine of Business*, which recently came under McGraw-Hill control through the consolidation of that organization and the A. W. Shaw Company of Chicago.

The *Magazine of Business* is published for the leaders in every branch of American business and treats of those major developments that affect business in general. It, therefore, has a strong appeal to the policy-forming executives in banking and finance, manufacturing and production, sales and distribution and in the servicing fields, such as transportation, communication and electric light and power.

The editorship of such a paper required someone with a broad experience in business, a thorough knowledge of editorial and publishing practice and an acquaintanceship with all the editorial resources of the McGraw-Hill organization. It is for these reasons that Mr. Mehren, who has been with the McGraw-Hill organization for 21 years, was selected for the editorship. He will continue as vice-president and editorial director of the McGraw-Hill Publishing Company.

Mr. Mehren began his publishing career as an associate editor on *Engineering Record*. Subsequently, he became editor of *Engineering Record* and of *Engineering News-Record*. For the last five years he has been vice-president and editorial director of the McGraw-Hill Publishing Company, in charge of the editorial activities of the organization. He has a wide acquaintance throughout business and is noted for his writing and addresses on engineering, industrial and business topics.

Changes in Louisville

Charles L. Christopher, superintendent of construction of the Louisville Railway, Louisville, Ky., for many years, will be retired from active duty, but retained as consultant, effective Oct. 1, 1928. He entered the company's service in 1891.

Howard C. DeVoe, assistant superintendent of construction, who entered the service in 1895, will be made superintendent of construction.

A. E. Gleason, becomes assistant superintendent of construction.

Appointments on Virginia Electric

C. B. Smith has been appointed to the position of purchasing agent for the Virginia Electric & Power Company, in Richmond, with general supervision over the purchases in Norfolk.

F. F. Kuyk is appointed general storekeeper for all of the storerooms on the company's system.

New Missouri Commissioners

Judge T. J. Brown, chairman of the Missouri Public Service Commission, has resigned, effective Oct. 1. Governor Baker has designated Judge Almon Ing, member of the commission since early in 1925, to succeed to the chairmanship, while J. Perry Painter of Milan, Mo., will succeed Judge Brown.

Judge Brown was appointed to the board on July 12, 1923, and was named chairman by Governor Hyde in 1924, when Judge Merrill E. Otis resigned to accept the position on the federal bench. He plans to devote his time to the private practice of law and will open an office in Jefferson City.

Obituary

GEORGE M. HASKELL, for 34 years New England representative of the J. G. Brill Company, Philadelphia, died at his New York residence, the Engineers' Club, on Sept. 22. The final cause was heart failure, but Mr. Haskell had been ill for several weeks before his death. He is survived by his widow, Mrs. Alice M. Haskell, and by a brother. The interment was at Wakefield, Mass., where he formerly lived.

Mr. Haskell was born at Wakefield, on July 10, 1867. His first business connection was in 1889 with the Thomson-Houston Electric Company at Lynn, Mass. Here he took what was known as the expert course and as a result was sent to Honduras in 1891 to install a municipal lighting plant. Upon his return, he joined the Boston office of the General Electric Company as railway appliance salesman, a position which he held for three years. He resigned on May 30, 1894, to enter the employ of the Brill Company, as New England representative, with New Haven as first headquarters. For the past sixteen years his headquarters have been in New York City. Mr. Haskell was a member of a number of clubs, including the Sleepy Hollow Country Club, Engineers' Club of New York, Engineers' Club of Boston and Boston Athletic Club. He had a wide acquaintance in the electric railway field and was very popular for his ready wit as a *raconteur*.

HENRY MATTINSON, general manager and chief engineer of the Manchester Corporation Tramways, Manchester, England, died on Sept. 2. An administrator, organizer, engineer, and originator, he was known and esteemed by the whole tramway fraternity. Educated as an engineer, he held appointments in various towns until he entered the Manchester municipal tramway department in 1901. He was largely responsible for the reconstruction of tramway tracks necessary at the time when electric traction superseded horses. Holding successively the posts of permanent way engineer and chief civil engineer, he became general manager and chief engineer in 1922 when J. McElroy, the then general manager, retired on account of ill health.

During Mr. McElroy's time with the Manchester tramways, Mr. Mattinson accompanied the gentleman on a visit to America to study traffic problems. He early appreciated the importance of the bus, and built up the local municipal bus services.

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Manufactures and the Markets

Large British Railway Orders

Metropolitan-Vickers Corporation, London, has received three contracts for electric railway equipment, totaling about £750,000 in value. The Metropolitan Railway has ordered 30 motor coaches and a number of trailer coaches. Each motor coach equipment will include four 275-hp. motors. The Southern Railway has ordered electric equipment for 72 motor coaches and 58 trailer coaches. The New South Wales Government Railways, Australia, has ordered 100 motor coach equipments and 100 trailer coach equipments for the Sydney Suburban Railways. There will be two motors of 360 hp. each on each motor coach.

Pacific Electric Plans $245,539 Improvements

Work orders calling for the expenditure of a sum aggregating $245,539 were approved by the Pacific Electric Railway, Los Angeles, Cal., during the month of August, covering improvements and betterments at various locations over the entire system.

On East Ninth Street between San Pedro Street and Hooper Avenue, this company is to reconstruct and pave tracks replacing present 72-lb. material with 128-lb. A.S.C.E. grooved girder equipment, to replace redwood with treated ties, install 79,000 sq.ft. of asphalt concrete pavement, etc. Entire cost of this project is estimated at $87,313.

At Las Tunas Drive, San Gabriel, it is planned to reconstruct approximately 6,370 ft. of single track and lower same to street grade, renew present 50-lb., 60-lb. and 75-lb. rail and fittings with 128-lb. A.S.C.E. grooved girder rail and fittings, install approximately 59,900 sq.ft. of asphalt concrete pavement, which work is necessary to conform to improvements to be made by the city of San Gabriel. Estimated cost of this work is $106,036.

At Del Rey on the Del Rey-Redondo line, Pacific Electric will construct spur track 618 ft. in length. The estimated cost of this project is $3,565.

In Redlands, Smiley Heights line, at Center, Cypress and Cedar Streets it is planned to renew 1,000 untreated ties with redwood ties, renew bolts and spikes and to install oil screening pavement in order to conform to improvements made at these locations by the city. The estimated cost of this work is $4,640.

In Los Angeles on the West Sixteenth Street line it is planned to renew double track 72-lb. narrow gage turnout from combination gage track with 128-lb., double-track turnout, renew redwood ties with treated ties, renew ballast and asphalt concrete pavement. The estimated cost of this work is $6,591.

On the Hollywood Line, it is planned to reconstruct and pave approximately 626 ft. of track, renew 7-in. asphalt concrete pavement, replace redwood with treated ties, and renew crushed-rock ballast and track bonding. This work is estimated to cost $5,139.

At Ohio Avenue, Sawtelle, it is planned to lower grade of west track approximately 8 in., reconstruct and pave tracks in the street, replacing 60-lb. material with 128-lb. grooved girder rail, install two reinforced concrete culverts replacing redwood culverts, and replace oil macadam with 7-in. asphaltic concrete pavement. Total cost of this work is estimated at $3,652.

At Whittier it is proposed to remodel store building to provide suitable quarters for Pacific Electric and Southern Pacific ticket office, waiting room and concessions at an estimated cost of $3,489.

Springfield Starts Trackwork

Springfield Street Railway, Springfield, Mass., has completed the construction of 800 ft. of double track on Main Street from Broad to Locust Street. This work is the most modern type of construction, on which steel ties have been used.

In connection with the new highway being constructed on Rockrimmon Road, this company is engaged in relocating its tracks from the side of the road to a center location. The double track will be extended northerly from the city line about 1,000 ft. There will also be a 500 ft. turnout where the former Rockrimmon turnout was located. This job is of considerable magnitude and will cost about $70,000.

Location and reconstruction of track on State Street at Benton Lawn has been started. This will be a complicated track work job and will cost about $45,000.

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

	Sept. 25, 1928
Metals—New York	
Copper electrolytic, cents per lb.	15.025
Copper wire, cents per lb.	17.125
Lead, cents per lb.	6.5
Zinc, cents per lb.	6.60
Tin, Straits, cents per lb.	48.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.175
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.8
Franklin, Ill., screenings, Chicago, net tons	1.50
Central, Ill., screenings, Chicago, net tons	1.025
Kansas screenings, Kansas City, net tons	1.75
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.3
Weatherproof wire base, N.Y., cents per lb.	17.625
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.4
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal	$0.57

New Tracks and Yard for St. Louis

The Interstate Commerce Commission has received an application from the St. Louis Electric Terminal Railway, St. Louis, Mo., and the Illinois Terminal Company, Springfield, Ill., for authority to construct a new line from McKinley Bridge, in St. Louis, to Twelfth and Washington Avenues. This will involve the rebuilding of present tracks over a part of the route. The improvement is to be financed initially through advancement from the Illinois Power & Light Corporation. Later the amount will be repaid by an issue of capital stock. The application explains that the St. Louis Electric is to be converted from a passenger line to one carrying both freight and passengers. The project includes the construction of a freight yard.

Worcester Plans More Trackwork

Worcester Consolidated Street Railway, Worcester, Mass., has started the relocation and reconstruction of both tracks on Grafton Street, Worcester between Posner Square and Mendon Street. It is estimated this job will cost $28,000, and will require the following material: 88 tons of rail, 6,100 ties, 105 thermit welded joints, 3,200 tie plates, 500 tierods and 21 kegs of spikes.

It is planned to reconstruct 2,252 ft. of track on Lincoln Street between turnout 13 and 166, at an estimated cost of $13,000. This job will require 63 tons of rail, 1,126 ties, 15 kegs of spikes, 2,252 tie plates and 320 tierods.

It is also planned to reconstruct 2,016 ft. of track on Lincoln Street from Dixon Avenue to Andrews Avenue, at an estimated expense of $14,600. This job will require 55 tons of rail, 1,000 ties, 2,016 tie plates, 336 tierods and 14 kegs of spikes.

Illinois Terminal Orders Equipment

Illinois Terminal Railroad System, Springfield, Ill., has ordered one hundred 40-ton box cars from Mount Vernon Car Company and one hundred 50-ton drop bottom gondolas from American Car & Foundry Company.

TRADE NOTES

EDWARD S. SULLIVAN, 751-753 Monadnock Building, San Francisco, Cal., has been appointed special coast representative for the St. Louis Car Company, to assist Gus Koch, coast agent for the St. Louis Car Company for many years. During Mr. Koch's enforced absence from the Coast on account of illness, Mr. Sullivan will take care of the routine of his office for him. Messrs. Koch and Sullivan have been office associates for over twenty years.

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Wisdom Wins in Wilmington

The style of architecture of the "Wilmington Car" conforms closely to the Brill 1928 Model Car which was exhibited at the Convention last year. New Beauty of design and finish, the improved comfort and safety features—all are mute testimony of the wisdom of the Delaware Electric Power Company in selecting equipment of proven performance, yet cars that appeal to the general public. All in all, the "Wilmington Car" is a splendid example of Brill leadership in engineering and construction. This car is sure to stimulate the public's desire to ride.

Write for the complete story of this new equipment.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

BRILL MODERN CARS

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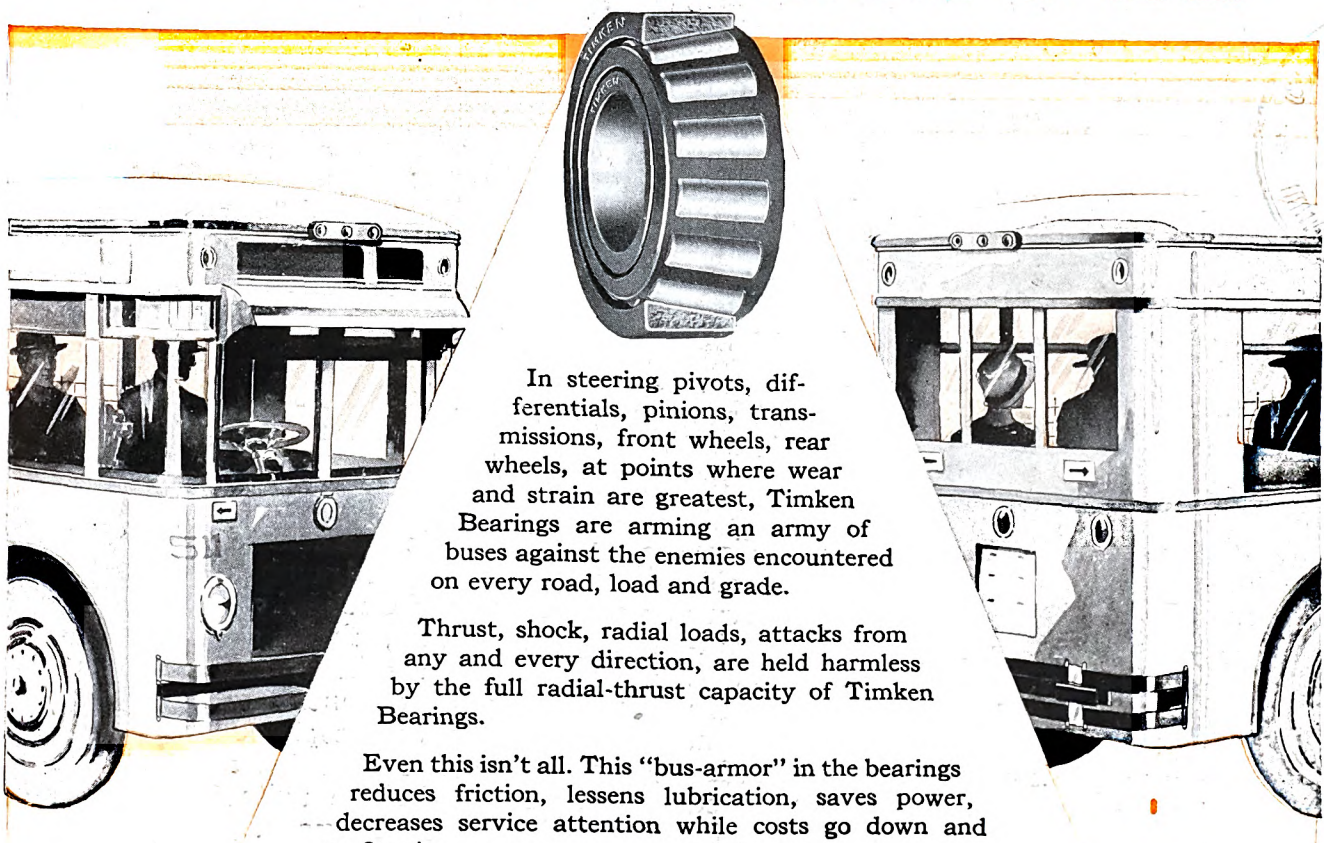
ELECTRIC RAILWAY JOURNAL

Graw-Hill Publishing Company, Inc. OCTOBER 6, 1928 Twenty Cents Per Copy

BUS-ARMOR



In steering pivots, differentials, pinions, transmissions, front wheels, rear wheels, at points where wear and strain are greatest, Timken Bearings are arming an army of buses against the enemies encountered on every road, load and grade.

Thrust, shock, radial loads, attacks from any and every direction, are held harmless by the full radial-thrust capacity of Timken Bearings.

Even this isn't all. This "bus-armor" in the bearings reduces friction, lessens lubrication, saves power, decreases service attention while costs go down and profits rise.

Longer life in Timken Bearings is assured by Timken tapered construction, Timken *POSITIVELY ALIGNED ROLLS* and Timken electric steel.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

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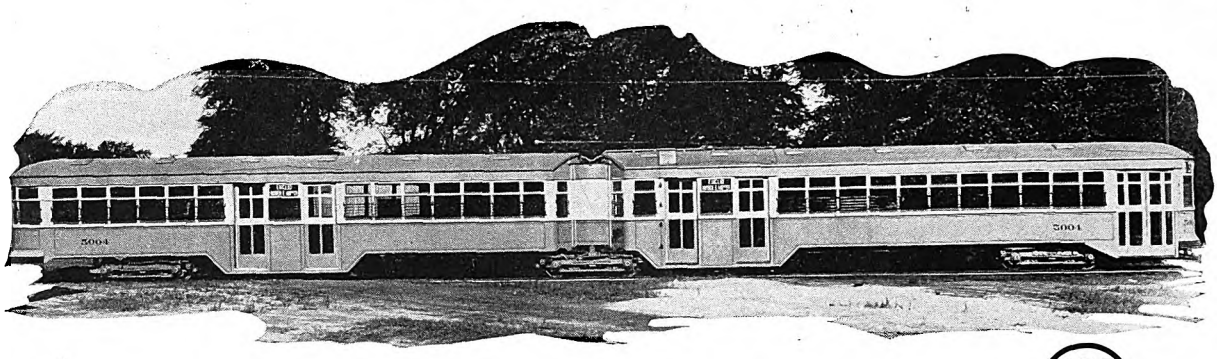
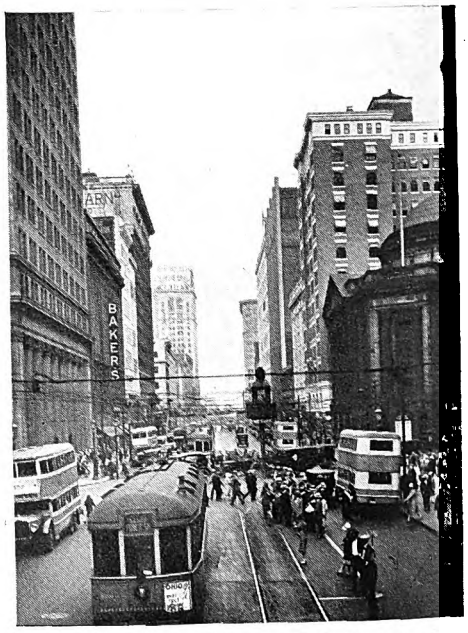


One of the 25 new Cleveland Articulated cars equipped with Westinghouse motors and control

Cleveland's New Cars *are Westinghouse Equipped*



Euclid and 9th, Cleveland's busiest corner.

UNIFORM and quick loading, rapid unloading, improved riding comfort, lower first cost, lower operating costs, lower annual maintenance expense, lighter weight, and the ability to haul more passengers without increasing traffic congestion, are the principal advantages afforded by the use of the 25 new articulated cars recently placed in operation by the Cleveland Railway on the Euclid Avenue line.

These articulated units have aroused much favorable comment from the increased and pleased number of trolley patrons on the Euclid Avenue Line. They represent, for surface mass transportation railway service, the very latest development for carrying large numbers of people comfortably and speedily. The control and motor equipment of these units bear the Westinghouse trademark.

Also, for fifty new double-truck city cars, the Cleveland Railway specified Westinghouse motors and control.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

CHARLES GORDON, *Editor*

LOUIS F. STOLL,
General Manager

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From Those Who Have Proved their Right of Leadership

RECAPITULATION of the high spots of the recent Cleveland Convention would be fruitless unless that recapitulation led local transportation men to take to heart the things that were developed at this memorable meeting. No one individual could attend all the convention proceedings, but they have been spread upon the record so that he who runs may read. Mention of Messrs. Stevens, Sawyer, Young, Bradlee, Kettering, Storrs, Williams and Wherry, to name just a few, ought to flood the mind with a background panoramic of accomplishments that should make every earnest worker in the industry avid to absorb every new thought in this mental feast. Surely any property can undertake to follow in the paths charted by these leaders who have tried in the crucible of experience the policies advocated for the improvement of the local transportation business.

The American program was so arranged that several points of view were presented, designed to bring out what the public ought to know about the industry, what the industry ought to know about itself and what the industry ought to know about the public's viewpoint. Mr. Young's address on Advisory Council night was different from the others in some respects. Its scope was broader. He took for his text the whole subject of the economics of the local transportation situation as it exists today. If the industry had undertaken to prepare its own Magna Charta the document could not have been drawn with more skill nor have presented the situation more succinctly than did this address. The plea was for the right of the industry to live. But that right was based only upon the industry's ability to serve as the most efficient form of public transportation, after the public, on its part, has recognized the need for rates of fare that will insure the necessary flow of private capital to enable the industry to keep pace with growing requirements and changing conditions. Private enterprise cannot function effectively if it is to be hamstrung financially through economic limitations imposed by an uninformed and unthinking public. This world-wide respected leader of American thought declared emphatically that it is high time that the public understand that efficient public service is impossible by a servant that is being starved into impotency.

Legal aspects of this situation were pointed out by Mr. Wherry, and Mr. Harriman on his part made plain the functions of the municipality, if the immense sums are to be raised that are needed in the financing of rapid transit lines, an obligation that has become a public matter rather than a private one. Local transportation men, lacking an understanding of these problems, cannot be said to be well informed. Neither can the man be said to be properly qualified to face the future who is not abreast of what has been done in modernization and merchandising as brought out at the American session on Wednesday. Here and there the tendency may be to scoff at some of the things suggested, but the scoffer is doomed just as he always has been. The spectacular progress of the automobile industry has been due to the lack of inhibitions on its part. That industry's will to do accounts in large measure for its success. Mr. Kettering made this plain in what he said.

The struggle against inertia is always a heroic one. The leader of thought knows what it is to be subjected to ridicule. But were it not for the advocate of change to meet changing conditions, the record of the progress of civilization would be a sad one indeed. The local transportation industry is now merely engaged in taking up the slack in progress resulting from the economic pressure of post-war conditions. Its record in the past contains many chapters of rapid change and readjustment. It quit the horse car for the cable, the cable for the electric car, and it has during recent years, even under severe economic limitations, made rapid progress in coordinating the bus with the rail vehicle.

Technicians need not neglect their fields of special interest in digesting and applying the ideas that come out of this great convention. The luncheon conferences and the sessions of the affiliated associations were so arranged as to stimulate discussion and the interchange of technical experiences. Here there is much to stimulate technical thought. But however close attention the accountant, the engineer, the claims man or the transportation man may give to the deliberations of the body in which he is most intimately interested, there remain the broader lessons arising from study of the major problems of the industry. Other things being equal, it is not too much to say that the individual will benefit from the convention only in direct proportion to the time he puts into consideration of how best he can intelligently apply what was said at Cleveland. This consideration and study, to be really fruitful, must ripen into personal convictions and then into definite application of the principles and methods outlined by those who have proved their right of leadership.

Claims Men Have Highly Interesting Meeting

MOST impressive and startling among the papers presented before the Claims Association was undoubtedly that by Mr. Carstarphen on the recent investigation on ambulance chasing in New York. Like the corresponding investigation in Milwaukee a year ago, it was conducted by the bench and bar, and the railway and insurance companies were connected with it only as they were asked to supply helpful data. When claims men in the past have complained about the extent of this evil, some people were accustomed to discount their charges. Evidence at the New York hearings, however, shows that amubulance chasing and accompanying evils in that city were being carried on to an atrocious extent.

The value of Mr. Carstarphen's account of the investigation has been enhanced by the publication this week of the conclusions reached from the hearings by the presiding justice. An abstract of Judge Wasservogel's re-

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port appears in the news columns of this issue. It reveals not only a most astounding condition in prevailing negligence cases but, what is more important, it outlines remedies for the ambulance chasing disclosed. The most valuable feature of this far-reaching investigation is that it was conducted under the authority of the highest court of the state and, like the investigation at Milwaukee already mentioned, upon petition of the bar associations.

If conditions like those exposed existed in New York and Milwaukee, they must be present at least to some extent in other communities. Where there is suspicion that this is the case, railway claim agents should call to the attention of the leaders of the bar in their cities the facts of the New York investigation.

Of equal practical value to the claim agent, though not of so sensational a nature, were the discussions of ways of recruiting claims staffs, promoting safety and other topics closely allied to claims procedure. Experience on methods of recruiting claims staffs was largely that for adjusters, native wit and common sense were more desirable than a good education. While this is true in many other special lines of business as well, Mr. Drown well pointed out there is a place in the claims department for the college man also, and that a well-rounded staff could well include many types of mind.

In the discussions and report on safety, there were many new ideas, since at the present day the safe operation of street cars has become almost synonymous with the proper regulation of automobile traffic, and no branch of regulation is changing so rapidly, perhaps, as that governing the use of the streets. This accounts for the perennial youth of the safety question.

Many Little Things Bulk Large in Net Results

ONE of the wisest axioms contained in Poor Richard's Alamanac runs "Trifles make perfection, but perfection is no trifle." Those who have read and studied the reports of the committees on service betterment and on traffic and safety which were presented at the recent convention in Cleveland cannot fail to have been impressed by the fact that most of the proposals call for the adoption of simple measures for attaining the desired ends—expedients at the disposal of most electric railways.

Taking up the very admirable report of the first-named committee, that on service betterment, we find recommended the extension of one-man operation wherever practical, in the interest of economy and improved service, the elimination of stops, police co-operation at important crossings, the establishment of loading zones, queue loading, improved methods of acceleration and retardation, and the improvement of personnel through better methods of employment and training. Surely nothing about this prescription is difficult to administer, yet these are all measures tried and found effective.

Perhaps a little finer discrimination and technique are, in some particulars, involved in the recommendations of the committee on traffic and safety, which call for application of the principles of psychology in the study of men and their accident tendencies. The smaller properties, perhaps, cannot go as extensively as might be desired into the finer points embraced in the study of accident characteristics, but this limitation is in part at least offset by the close contact between management and employees that is possible on the small road.

In its discussion of speeding up traffic with safety the committee again confines itself to the recommendation of simple but effective methods. Safety zones, treadle exits, double berthing, street collectors, simplified fare collection—there is nothing to prevent the adoption of these suggestions on the average property.

Here, then, are the recommendations of two committees, the membership of which was drawn from the best minds in the industry. Commendable as they are for their very simplicity, they yet represent much thought and study. Very few of the suggestions are debatable. They present a concrete program. Let us hope that by the time another year has rolled around, many companies will be able to report substantial progress as the result of the adoption of this simple program of service betterment.

Engineers Eager to Play Their Full Part

PROBABLY never before in its history has the American Electric Railway Engineering Association had so many vital problems before it for solution. A large proportion of the service improvements which are now considered essential to bring back prosperity to the railways present in the last analysis engineering problems. Rolling stock must provide for increased speed with safety, greater comfort and convenience. Track must be smooth and noiseless. The electrical department must provide increased economy and reliability of service. All of these things are being seriously considered by the engineers. This was evident from the reports, addresses and discussions at the convention.

The programs for the various divisions of the Engineering Association at Cleveland were arranged with two central thoughts in mind: first, to provide for reports and discussion of the work now actually under way by the various committees; second, to bring out new thoughts and discussion of the principal problems by having addresses on outstanding phases of each division's work. More interest than ever before was evident from the start. Each day the simultaneous sessions of the four divisions were all crowded. Comparing this condition with the attendance four or five years ago, when with all divisions meeting together it was almost impossible to get enough together to start the meeting, the contrast is striking.

The advantages that have resulted from the reorganization of the Engineering Association are many. First, with a single assignment to each committee the members have more time and inclination to make a thorough investigation. Second, the plan of continuing committees until the subject is completed has done away with hurrying of work in order to present a report at the convention. This year a large number of committees presented progress reports only. These showed that the scope of investigation is being broadened to give more thorough study to the subjects involved.

Voting on standards by letter ballot, under the new plan, gives all member companies a chance to state their views fully, regardless of whether or not they have delegates at the convention. As a result it is logical to expect more careful consideration of proposed standards and increased use of these standards after they are adopted. The disposition of delegates at this year's convention to exchange information and to tell of results accomplished is a good omen and shows that the engineers realize the importance of the part they play in helping the industry to meet the new conditions with which it is confronted.

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Accident Prevention a Great Public Service

CONCLUDING a year of highly successful accomplishment the National Safety Council held its seventeenth annual safety congress in New York City during the week just closed. Although in no sense a strictly electric railway enterprise, as its activities cover the entire field of accident prevention and the spreading of safety information throughout all groups in modern society, it is nevertheless gratifying to find that the electric railway industry is credited for no small measure of the success which the movement sponsored by the National Safety Council has attained. In every considerable community in the country the electric railway companies have been prominent in the organization of local safety councils. In many instances they have supplied the most active support, both moral and financial.

Admittedly the chief problem before the council at its recent meeting was that of coping with the rising toll of traffic accidents due to the increase in the number of automobiles and the resultant vehicular congestion upon the streets and highways. This is a question in which the railways are most vitally interested, and it is to them that authorities are inclined to turn in an effort to bring the situation under control. Nor has the appeal been made in vain. Alone among the interests using the streets for traffic purposes, the railways can point to a steadily decreasing accident record. In city after city the records will show that the local transportation companies are reducing their toll of chargeable accidents. More and more evident is it becoming that in no place is a person in less danger from injury to life or limb than when riding as a passenger in a trolley car.

This is the result neither of luck nor of chance. Hazards have unquestionably increased. Safe operation is undoubtedly more difficult today than ever before, due to the presence on the streets of thousands of untrained or, at best, insufficiently trained, motorists. The results achieved can be credited to a variety of causes. Better equipment has played an important part. In the aggregate enormous outlays have been made to secure and equip safer and more dependable cars, safer signals, better track. But the answer must go deeper than physical outlay. Back of any equipment, in order that it may be effective, there must be a well-trained and efficient inspection force. And at the controller and on the rear platform there must be an alert, careful, thoroughly-drilled and carefully-chosen operator.

In the final analysis it is here that the real credit belongs. No matter how able the management, how ample the company's financial resources, how modern the rolling stock or how efficient maintenance, all will be of little avail in keeping down the accident toll and holding to a minimum that least excusable of all company expenditures, money paid out for claims, if the men at the controllers are indifferent, irresponsible or just plain careless. However high up a "safety drive" may have its inception, it must, sooner or later, come down to the man on the car. And it has done just this thing. The aim of every well-organized, efficiently-operated street railway property in the country today is to reduce accidents through the proper training of its platform men.

Hence the interest of the street railway industry in the activities of the National Safety Council. Through the agency of this great humanitarian institution the industry finds a means of allying itself with a great public spirited movement toward the preservation of human life and the reduction of injury and suffering. It is particularly appropriate that electric railways are playing a leading part in safety work. To the extent of the part they play in helping to reduce accidents they live up to the spirit of the term "public service" and strengthen their claim for public confidence and friendliness.

Accountants Alert to Their Responsibilities

REAL progress is being made by members of the American Electric Railway Accountants' Association in solving the problems which have presented themselves recently. This was very evident in the detailed reports of the several committees and the active discussions which followed the presentation of these at the convention. The addresses, too, reflected a note of progress in specific branches of electric railway accounting.

The first large work undertaken by the association was the drafting, in connection with the Interstate Commerce Commission, of the standard classification of operating accounts. For many years this, with the addition of construction and other accounts and the yearly refinement and clarification of the code, was the association's *magnus opus*. Within the last few years it has undertaken the same problem in connection with bus accounts.

Each year, however, brings new accounting tasks, and they show alike the intimate connection of accounting with the entire field of railway operation and the constant demands for original and creative thought in this field. Perhaps the most important problem of this kind now before the accounting branch of the electric railway industry is that raised by the question of accounting for depreciation, to which the Interstate Commerce Commission is giving intensive consideration.

This commission, as is well known, has ordered telephone companies and steam railroads to adopt a definite system of accounting for depreciation, and early this year asked the interstate electric railway companies to show cause why a similar order should not be issued concerning them. A sub-committee of the national relations committee of the American Association was formed to present to the commission the views of the industry on the questions involved. The Accountants' Association has co-operated with this committee and a number of joint meetings have been held. The subject is one of vital importance to the industry, and once again the accountants are bending their efforts in solving a problem that is likely to be a big factor in the future of the electric railway.

Other subjects of importance have commanded attention, notably freight accounting, price records and stores accounting. The committees handling these subjects have investigated the new phases which have developed and have prescribed definite methods of accounting for them. For example, the freight committee developed a system of accounting in connection with the handling of interline freight and C.O.D. despatch freight business and described the mechanics of this system in its report.

The responsibility of every accountant in the industry at this time should be quite apparent. To quote President O. H. Bernd of the Accountants' Association, "Every electric railway accounting officer should realize that he has a more important part to play in the progress of the industry than ever before." Mr. Bernd sounded a call to the accountants to show their qualities of leadership at this critical period in the history of industry and it is more than significant that they are responding with genuine enthusiasm.

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The parade of new cars, run as specials, attracted attention. This view was taken in May, 1927, on Plume Street, Norfolk

Success Won by

Courage and Hard Work

ON JULY 1, 1925, the transportation affairs of the Virginia Electric & Power Company were in an entirely different condition than three years later. At the earlier date there seemed to exist almost a complete misunderstanding between the company and the public. The latter, as in some other cities, seemed convinced that the day of the street car had passed. Ruinous bus competition was being invited and fostered in all of the cities served by the company, four in number, Richmond (200,000 population), Norfolk (177,000 population), Portsmouth (50,000 population), and Petersburg (39,000 population). The physical property on the system was deteriorating. Renewals of expiring franchises could not be secured. Essential fare increases had not been obtained. Richmond, where electric railways were first operated in city-wide service, seemed ready to contribute spectacularly to the decline of the electric railway industry.

On July 1, 1925, the executive management of the property was taken over by Stone & Webster, Inc., and a new group of officers took charge of the problem of re-establishing the prestige and prosperity of the property. The new management decided that the first problem was to win public confidence, and this could be done only by evincing in a material manner its faith in the essential nature of its business and of rendering an adequate service at the lowest practical cost. The service betterments that did not have to wait upon new capital and the delivery of new equipment were made

The Coffin Award Committee for 1928 characterizes the recent operation of this year's prize-winner, the Virginia Electric & Power Company, in the following words:

THROUGH demonstrated efficiency and confidence won by fair dealing, a bitter public in several closely associated communities imbued with keen rivalry and intense local pride was converted to friendly co-operation and to the settlement of extended and complicated franchise controversies. Co-ordination of bus and trolley service, extensive improvements in facilities and intensive merchandising led to an increase in number of passengers carried on both street cars and buses, increases in gross and net revenue and in the return on the investment; through corporate consolidations the number of subsidiaries was reduced, the financial structure was simplified and strengthened and local financing was carried out at low cost. New and modernized equipment was provided, employee co-operation enlisted and favorable financial results achieved.

It is the purpose of a series of articles in this issue to give some of the evidence upon which this conclusion was reached. The articles are based upon the figures and other data in the company's brief.—EDITOR.

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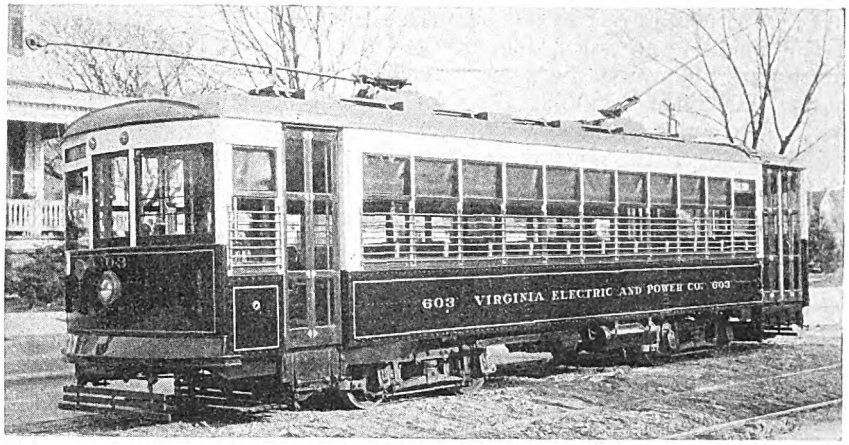
immediately. Then came the problem of settling franchise problems, including abolition of jitneys and then establishment of adequate fares. Coincident were the modernization of the company's rolling stock and provision of new track facilities. The modernization was undertaken by the company without first demanding concessions on the part of the public.

Through group meetings, individual contacts, newspaper and other forms of publicity, the new management presented to the public and employees alike its ideals, hopes and plans for rendering an excellent transportation service at lowest possible cost. Suggestions and criticisms were invited, co-operation was solicited and the public generously responded to the concrete evidences of good faith and sincerity on the part of the management.



This new treadle car, with leather seats and rubber-tiled floor, for use in Portsmouth, is right up to the public's wish

On Sept. 1, 1925, only two months after entering office, the new management submitted a franchise for a unified car and bus service in Richmond. Twelve days later it announced that the Independent Bus Company had been purchased at a price deemed fair by a committee of citizens, appointed by the Chamber of Commerce. This action relieved the city of considerable embarrassment in the problem of unification because the bus company was operating under a former ordinance. The following year the company received a new franchise which is for 30 years, the legal maximum. It permits the company to charge a 7-cent fare on the cars and an 8-cent fare on the buses, plus 1-cent transfer charge from car to bus, and to make track extensions and install motor bus routes of the most thoroughgoing character.

Car or Bus Line Within ¼ Mile of Residence Area

It should be noted here that cities in Virginia are not empowered to grant a direct bus monopoly. The nearest they can come to it is to specify that (1) a concern operating any buses within the city must operate all of them, and (2) the operator of any such bus system must enter into some transfer arrangement with the local street railway. These conditions have been embodied in every bus ordinance covering the operations of the Virginia Electric & Power Company.

In accordance with the franchise program, the company arranged for improvements in Richmond totaling $1,500,000. This included the abandonment of five miles of track, the construction of 10 miles of track, largely in sparsely settled areas, the addition of 35 miles of through motor bus routes and the purchase of 15 cars and 30 buses.

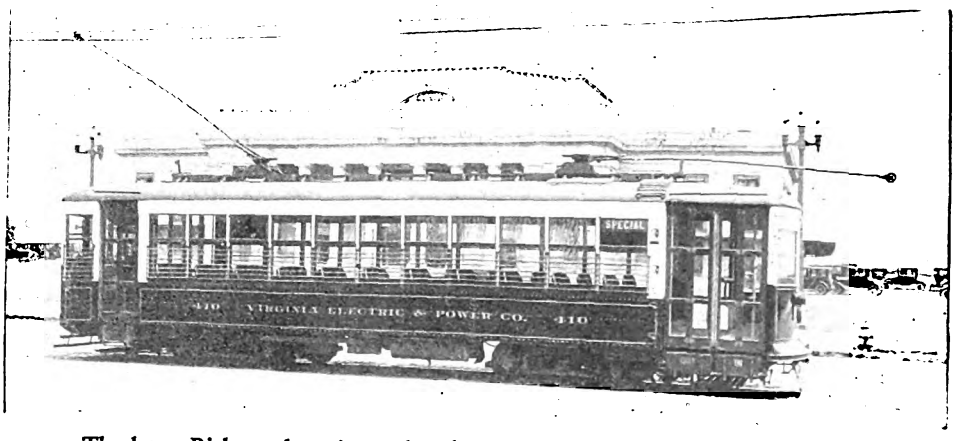
The goal of this program was to have either a car or bus route within ¼ mile of any residence area in Richmond. This gives the public a unified system of 160 miles of route with a maximum fare of 8 cents instead of 65 miles of railway for 7 cents or 17 miles of bus route for 8 cents.

The new franchise gross receipts tax is 5 per cent during the first year, decreasing to 3 per cent minimum at the rate of one-fifth of 1 per cent per annum over a ten-year period. This compares with the former average of 6¼ per cent from railway gross. The 5 per cent from motor bus gross still holds.

Norfolk Eliminates Duplication of Routes

The Norfolk program was somewhat different from that in Richmond because Norfolk had too much service and Richmond too little. In Norfolk the program of improvement led to the elimination of duplicative lines whereby 159 miles of rail and 86 miles of bus route were converted to 123 miles of rail and 86 miles of bus route. The bus mileage total is a coincidence, as the routes in many cases are different.

The fares are also changed by abandoning the old school rate of 2½ cents, the 6¼ to 7 cents per zone railway rides, and the 5 cents (colored) and 7 cents (white) jitney no-transfer one-zone fare for a universal schedule. This calls for 10-cent cash fare, 8⅓-cent token, 4⅙-cent school ride and $1.50 unlimited ride weekly pass, all with free transfers. The adoption of the one-fare plan for all Norfolk meant a single fare instead of double and triple fares in an area which was annexed to the city in 1923. This was a change greatly desired by the community, as represented by a traffic commission which had been appointed by the City Manager. The new franchise also abolished jitney competition which in Norfolk had amounted to 25 per cent of the total traffic, as compared with only 10 per cent in Richmond.



The latest Richmond car is worthy of its background, the Broad Street Station

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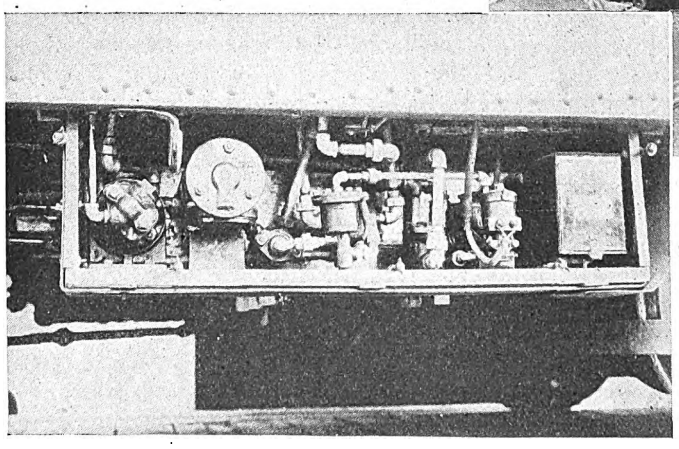
In Portsmouth (60,000 inhabitants) a somewhat different condition prevailed from either of the other cities mentioned. Here also there was extended jitney service as well as a long standing deadlock between the city authorities and the company with regard to the repaving of High Street, the main thoroughfare of Portsmouth.

Shortly after the present management took charge it settled the latter question by offering the city $130,000 to cover the company's share of the repaving program, plus track reconstruction. It terminated the jitney problem by taking over the Independent Consolidated Bus Corporation on a basis of physical value. Its present franchise in Portsmouth calls for a 7-cent fare instead of the former fare of 5 cents on the buses (7 cents on one route) and 6 cents on the railway, and a reduction of the company's paving obligations to that of furnishing concrete foundations within the track area to a depth of either 6 in. or 7 in., as may be specified by the city.

The generous manner in which the public in the four cities served responded to concrete evidences of good faith and sincerity on the part of the new management, and accepted their responsibility in the solving of the problem, is a revelation.

The chief physical factor in bringing about this change in conditions and finances were 30 new and 66 modernized street cars and 114 new and 62 modernized buses.

The $3,800,000 of new money invested under the new management earns a return of 11.6 per cent before depreciation. The story is told briefly in the accompanying table and graphs.



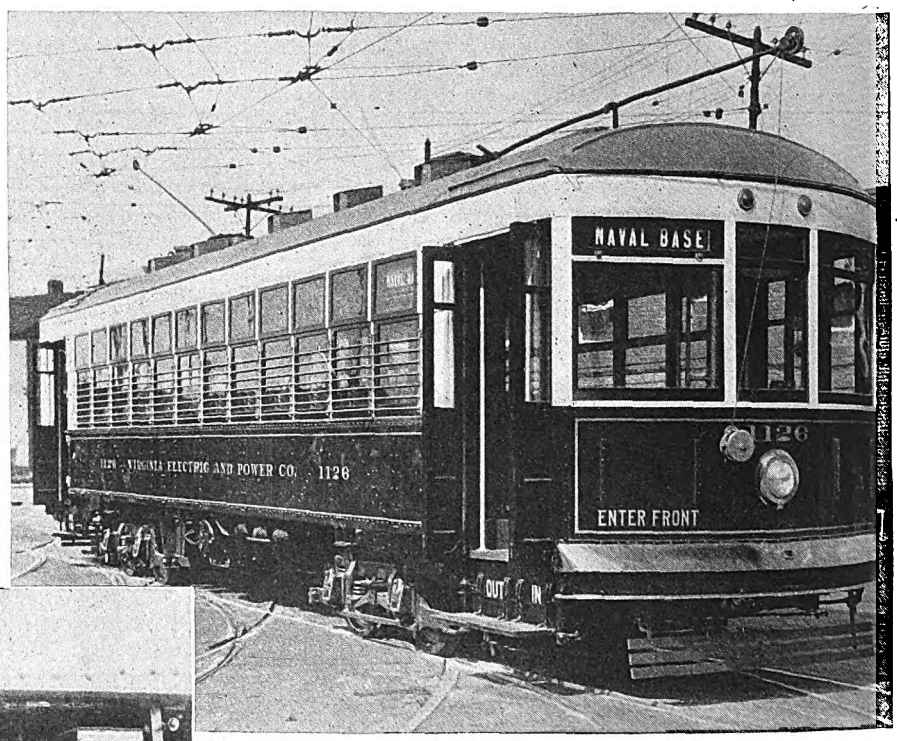
The valves in the Norfolk car are snugly mounted in an electrically-heated box under the floor

Improved Cars and Service Bring Results

As already explained, the confidence of the public was won largely by the policy adopted by the company in improving its rolling stock.

Within three months after the present management took hold in Richmond in July, 1925, an order had been placed for fifteen treadle-type, 44-seat double-truck cars, available for one-man operation. They attracted immediately favorable attention to their bright appearance and comfortable riding qualities. The exterior finish was a combination of red with gold lettering below the window level and of white above. The interior fittings included deep plush seats, rubber-tiled floors, non-swinging sanitary hand straps, mahogany interior trim, and all piping, engineer's valve, controller, brake staff and switches neatly covered. The cars are equipped with four 25-hp. motors, K-35 control, variable load brakes, and automatic slack adjusters.

The second order for treadle cars, placed during 1926, went to Portsmouth. In compliment to the large Navy Yard community there, the outside color scheme is red, white and blue, but these colors were disposed to avoid freakishness. The roof is light blue. Red with gold striping and gold lettering is used for the lower window level, and white above. These colors were not intended to hide dirt. In fact, they expose it.



Norfolk's latest red, white and blue cars for naval base service

Exceptional brilliance was given by the use of a deep blue to outline the headlights, window guards, trolley catchers, and step castings leading to the roof. The equipment consists of four 25-hp. motors K-75 chair level control, air brakes with variable load feature, automatic slack adjusters, safety door and treadle control and vestibule window cleaners. The inside fittings included seats of genuine leather, spaced 28½ in., flooring of 12-in. rubber tile, and air-operated fare box.

INCOME ACCOUNT AND STATISTICS, VIRGINIA ELECTRIC & POWER COMPANY

	Year 1926	Year 1927	Increase Per Cent
Total operating revenues	$5,786,833	$6,151,291	6.30
Total operating expenses	$4,150,047	$4,076,591	—1.77
Net revenue operations	$1,636,786	$2,074,700	26.75
Taxes	$406,925	$483,799	18.89
Balance	$1,229,861	$1,590,901	29.36
Depreciation	$738,436	$800,000	8.34
Balance	$491,425	$790,901	60.94
Miles operated	22,506,309	22,971,020	2.06
Hours operated	2,456,984	2,486,195	1.19
Total passengers carried	*98,847,208	102,423,544	3.62

*The total number of passengers reported for 1926 has been adjusted to conform to the change from zone-fare registration to single-fare registration, which was effective Jan. 1, 1927.

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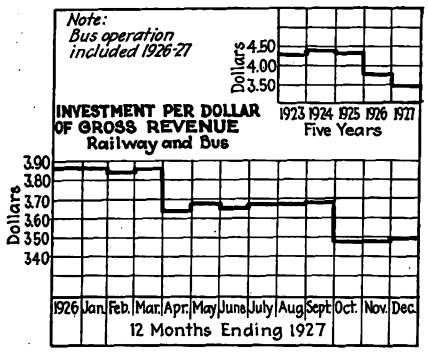
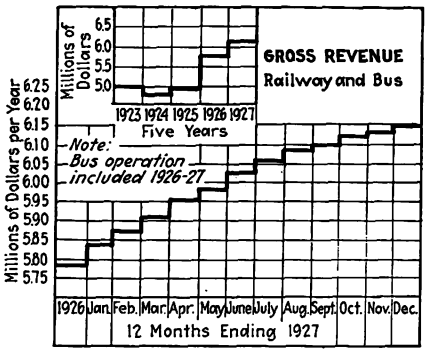
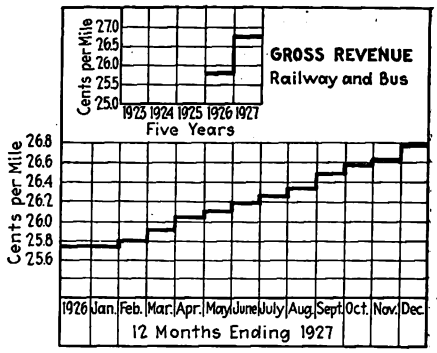
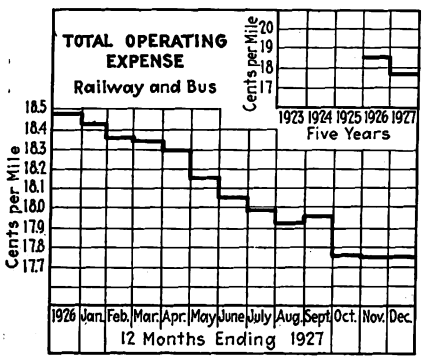
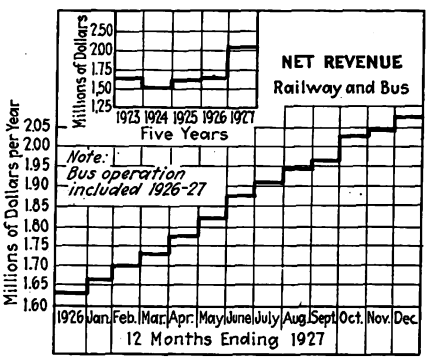
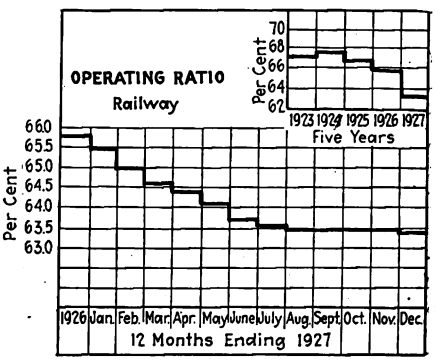


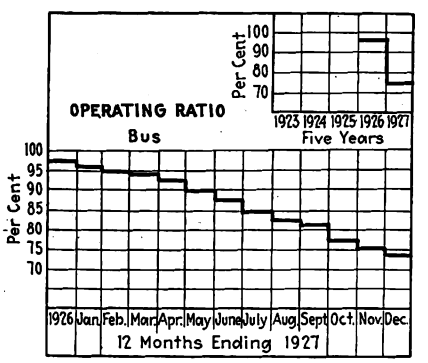


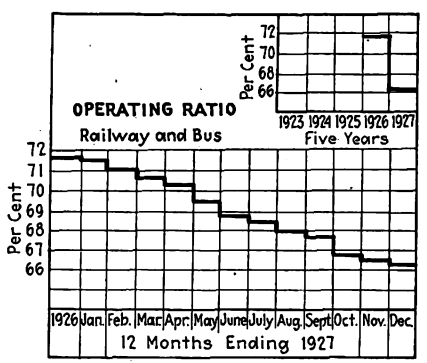


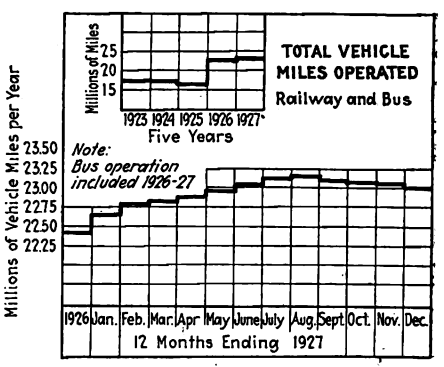


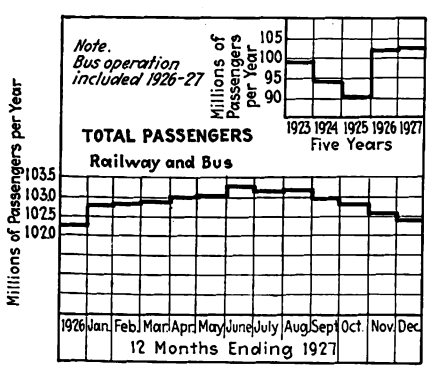


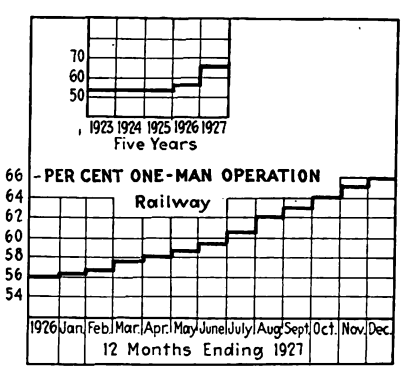


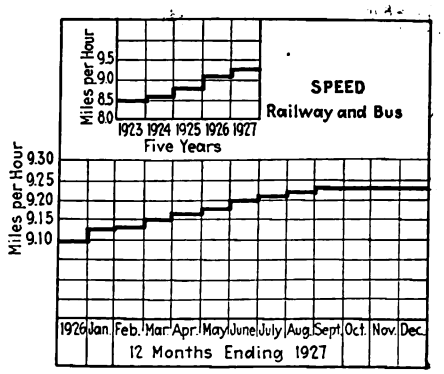


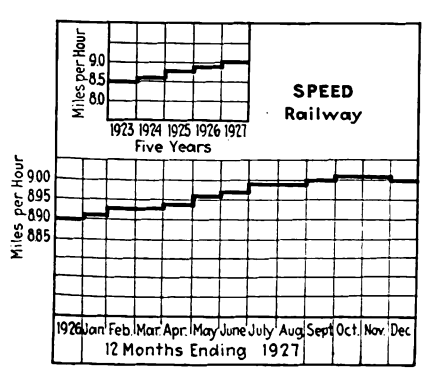




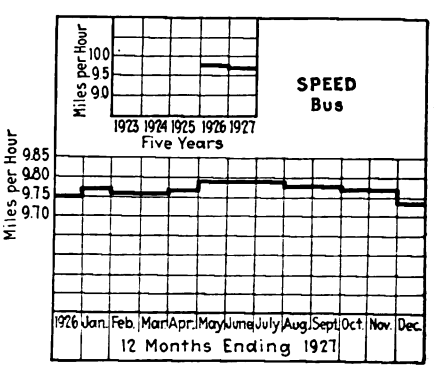








THIS series of charts, beginning with investment per dollar of gross revenue and ending with bus speeds, tells graphically a most instructive story of the way in which the railway properties of the Virginia Electric & Power Company were placed on a substantial basis



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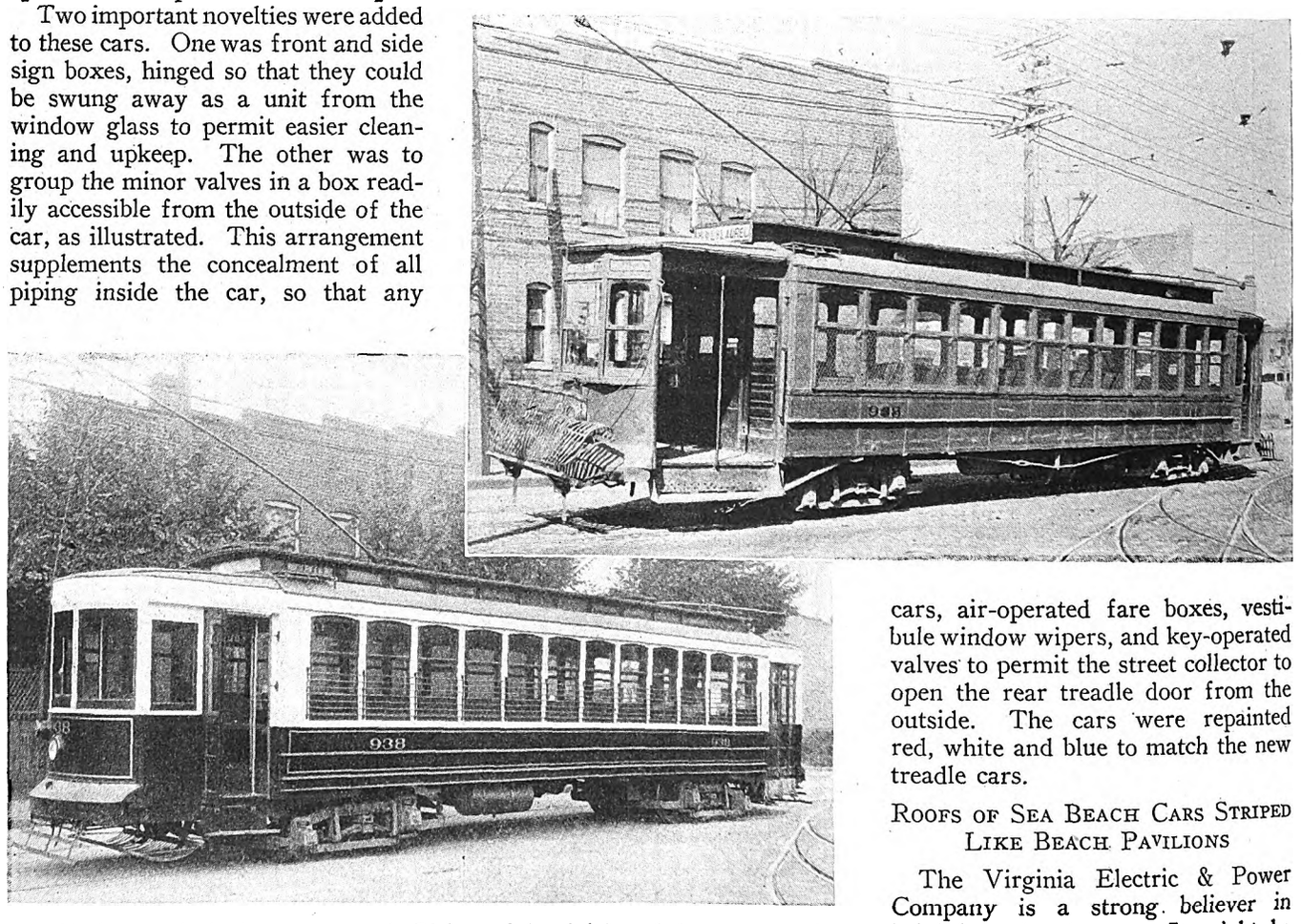
The third order for treadle cars, delivered in the spring of 1927, went to Norfolk. There were ten of them, closely resembling the Portsmouth cars, but somewhat heavier and of more advanced equipment. They have four 35-hp. motors instead of four 25-hp. motors, to permit speed of 35 m.p.h. on the long runs to the beaches. They are 43 ft. long over all, instead of 41 ft. 8½ in., and weigh complete 37,000 lb. instead of 32,000 lb. Like the Richmond and Portsmouth cars they were fitted with variable load brakes, rubber-tiled flooring, air-operated fare boxes with direct illumination, etc. The seats, however, are of twin design, upholstered in genuine leather, and with double spring cushions. They are spaced 30 in. apart instead of 28½ in.

Two important novelties were added to these cars. One was front and side sign boxes, hinged so that they could be swung away as a unit from the window glass to permit easier cleaning and upkeep. The other was to group the minor valves in a box readily accessible from the outside of the car, as illustrated. This arrangement supplements the concealment of all piping inside the car, so that any harshness due to obtrusive hardware is avoided. An electric heater in the valve box forestalls freezing.



An old, down-at-the-heel, two-man car in Richmond (at right) and the same car after receiving a "face-lift" and equipment for one-man treadle operation

Among the cars at Richmond were 40 double-truck two-man cars with 44 to 48 seats. Although built in 1911, they were so sound that it was found desirable to rebuild them for one-man operation for $4,500 each. New platforms were installed, the safety car devices and treadle combinations were added, line switches replaced circuit breakers, air brake and door valves were put under cover for greater sightliness and safety. The outside finish of red, white and gold was exactly like that of the treadle cars.

The Norfolk change from double-end two-man cars, numbering 26, to one-man treadle cars, was accomplished by alterations even more drastic than in Richmond, and $6,000 was expended on each car. The four 35-hp. motors were retained, but the control was changed from K-35, with circuit breakers, to K-75 (chair level style), with line switches. Automatic slack adjusters were added. Brake and minor valves were concealed under the seat, the door-control piping was installed behind the advertising rack, and the door engines set in cabinets over the doors. All but the first three cars had rubber-tiled flooring. Air cushioned twin leather seats replaced the rattan covered seating of shaped wood. The longitudinal corner seats were taken out so that the cars now have 24 double seats from end to end. These seats are 36 in. wide along a 26-in. aisle. With the change in seating came stanchions and corner grab handles of aluminum, also sanitary non-swinging hand holds. Other features added were: Side destination signs of the unit type devised for the new cars, air-operated fare boxes, vestibule window wipers, and key-operated valves to permit the street collector to open the rear treadle door from the outside. The cars were repainted red, white and blue to match the new treadle cars.

Roofs of Sea Beach Cars Striped Like Beach Pavilions

The Virginia Electric & Power Company is a strong believer in brightly painted cars. It might be supposed that the red body, white trim and blue roof of its Norfolk and Portsmouth cars represented the ultimate in this direction, but in the summer of 1927 there seemed to be a step further with the open bench cars that serve Ocean View. This is part of the Norfolk division.

The roofs of these cars are painted in broad stripes of orange and blue to bring to mind the gay pavilions and awnings of the sea shore. To see these cars on a warm day is to have a powerful urge to take a ride forthwith for a loll on the sands.

Single-Truck Cars Also Modernized

The car modernization program has even been extended to the company's single-truck safety cars, although not in a like measure, because they are to be the last of their kind. However, all safety cars of this type have been changed from cast iron to rolled steel wheels to eliminate chipped flanges and reduce noise from flats. Forty have been fitted with new motors and 25 with new

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compressors. Two cars have been fitted with anti-friction bearings. Several have been equipped with leather seats, treadle doors and linoleum floors. All of these cars are being painted in a duotone.

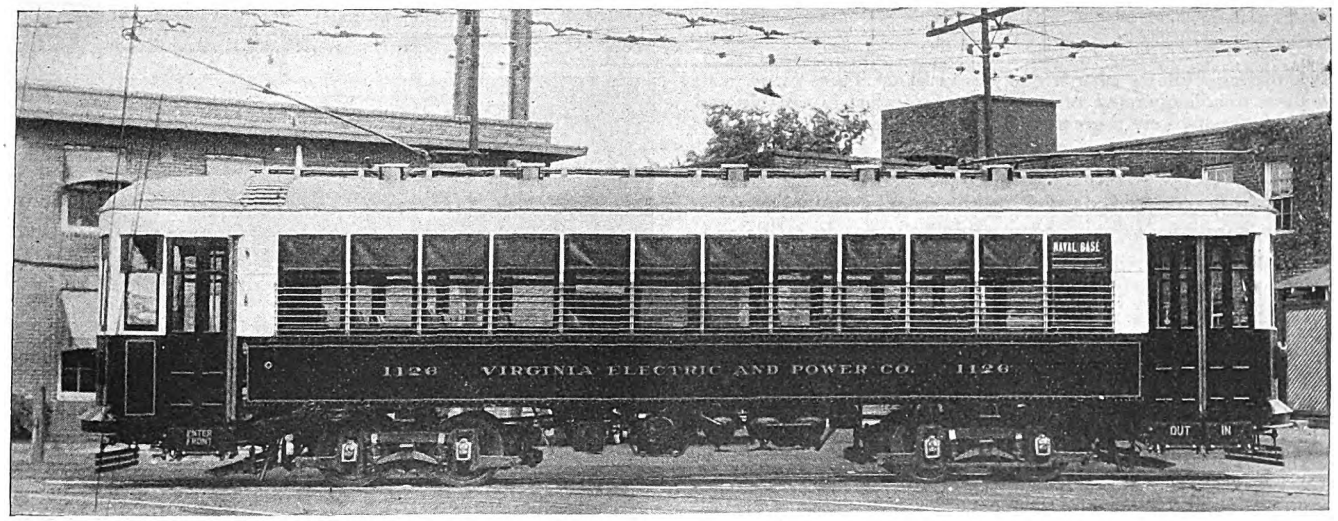
Bus Fleets Also Modernized

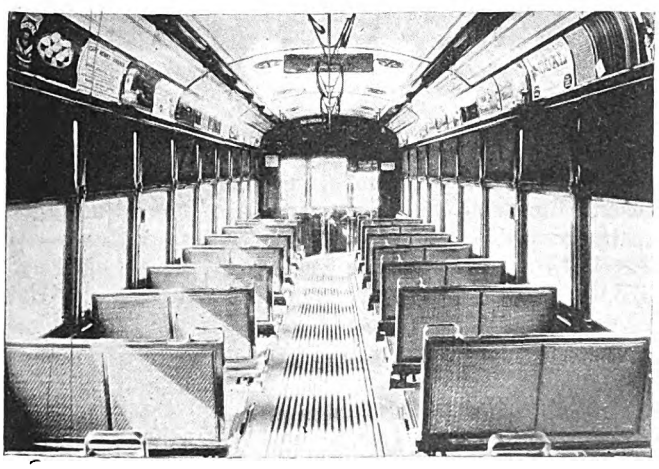
During 1927, the bus fleet was enlarged by the purchase of 68 vehicles. Of these, 28 were 21 and 25-passenger buses with rear doors and booster brakes. Thirty were 29-passenger buses with treadle-operated rear doors, air brakes and metal brakeshoes. The final order, placed in December, 1927, was for ten Twin Coaches of 40-seat capacity, for the Colonial Place line of the Norfolk division. The larger carrying capacity of this bus made it possible for nine coaches to do the work of eleven buses, with no appreciable lengthening of headway.

Coincident with these additions to the fleet, a number of the company's old buses were modernized. The company had taken over on both its Richmond and Norfolk divisions a number of used buses belonging to former proprietors. Only the most up-to-date of these were selected for a modernization program. The principal changes were the addition of a new hood and roof, rear door, self-starter, illuminated roller destination sign, roof ventilators and rear channel and rear bumper, with anti-climber shield to discourage hitching.

While the improvements in the way of more attractive and more comfortable cars and buses have a great deal to do with the improved riding, it was not the only factor in bettering conditions on the property. Another important factor was an increase which was made in schedule speed.

Realizing the demand by passengers for more speedy service, a study was made of every item of delay. Such causes may be the fault of street or track layout, of changes in traffic use of the highways operated over, of the car design, of the rates of acceleration and retardation used, of the technique and motions of the operator, of the method of fare collection, etc. The study disclosed some causes possible of correction by the company, and others within the control of the municipality. The latter related primarily to unnecessary congestion of high-





After a "one-man treadle treatment" with leather cushions in place of wood and a dress of red, white and blue, Norfolk cars were made to look quite different. The upper view shows the reconstructed car; the two lower views, the interior before and after

ways through parking abuses, change in the character of traffic signals, removal of obstructions, provision of car and bus loading spaces, etc. To assist the municipality, the company conducted in both Richmond and Norfolk cordon counts of traffic. They were of help in pointing the way to means for higher speed. By patience, study and the reduction of some of the greatest causes of delay, the average speed of the cars during two years was finally raised from 8.75 to 9.25 m.p.h.

Charts Tell the Story

Outstanding features in the rehabilitation program of the company will be told in this and later issues. It is satisfactory to follow these changes graphically so far as

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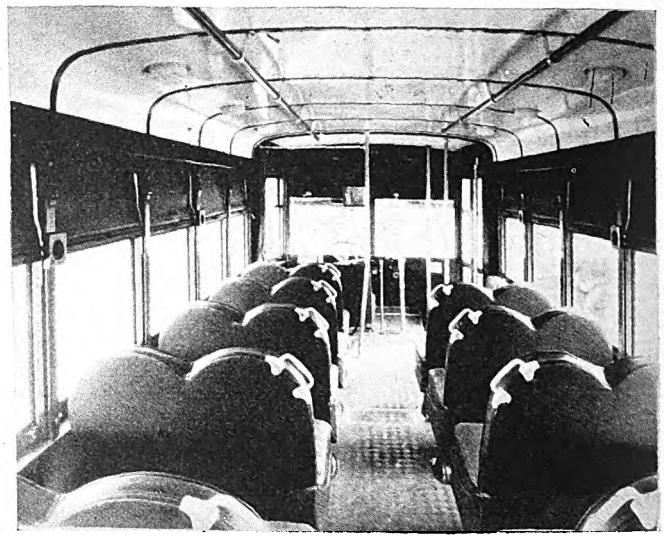
Norfolk now knows what a real bus is like. These buses, with their treadle-operated rear doors and comfortably-upholstered leather seats, were a great change from small jitneys



they can be charted, as well as the financial rehabilitation of the company which accompanied them. For this reason considerable space is given in this issue to the charts contained in the company's brief.

The first chart reproduced shows that the investment per dollar of gross revenue to carry on transportation with car and bus had a rapid decline for 1926 to 1927. In part this result was obtained, despite the large addition of new capital, through the writing off of useless property from the rate basis. Another reason was the lower investment per dollar of gross revenue obtained from new and self-sustaining bus operations.

The charts giving the gross revenue of railway and bus show an increase in gross revenue for the property as a whole both in total and in cents per vehicle-mile. Bus earnings began only in 1926, but both types of transportation increased their earnings during the years 1926 and 1927.

The fourth chart shows the operating expenses of the railway and bus. The increase in 1926 over the previous year was because of the acquisition and expansion of bus operation, but 1927 showed a reduction in expenses despite the mileage rise, given in a later chart.

Net Revenue Mounted Rapidly

The fifth chart illustrates how the net revenue of railway and bus mounted rapidly during 1927, after a modest beginning in 1926.

The next two charts give the operating ratios of railway and bus respectively. That of the railway alone shows a decline as early as 1925 from the 1924 top, approaching 68 per cent. By the end of 1927 it was under 63.5 per cent. The operating ratio of buses was so close to 100 per cent in 1926 that there was a deficit on the year's operation. By the end of 1927 the operating ratio stood around 75 per cent and there was a profit on bus operation.

The next chart showing the combined operating ratio of railway and bus lines is presented only to round out the record, because these two ratios really are not on a comparable basis.

The next chart shows the total vehicle-miles operated and illustrates the expansion of the company's operations as a whole.

The next chart gives the nominal number of total passengers, but owing to the use of the zone system in 1926 and earlier years a false impression is given by the chart. During those early years some riders were counted a second time and others a third time. To adjust 1926 with the present fare basis it is necessary to deduct 2,964,347 riders who were counted the second time and 373,932 riders who were counted a third time. This gives the equivalent of 98,847,208 riders for 1926 against 102,423,544 for 1927, making the gain for 1927 equal to 3.6 per cent.

The other charts on page 627 are self-explanatory, as are also those on page 631. Further reference should be made, however, to the earnings on the new capital, for, after all, money counts.

New Capital Earned 11.6 Per Cent Before Depreciation

To provide the greatly improved and unified transportation service which has been pictured in the preceding article, the new management has spent since the date it took over the operation of the property on July 1, 1925, up to Dec. 31, 1927, approximately $3,800,000. Of this amount $1,860,000 was for the purchase of competitive bus lines, together with new buses and other equipment. The remainder was for new track and overhead, largely in connection with the rerouting program, new cars, rebuilding and modernizing existing cars and for new car and shop equipment.

This is a large amount of money to put into a business

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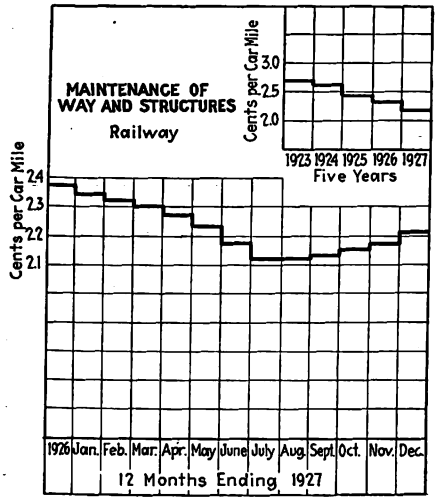
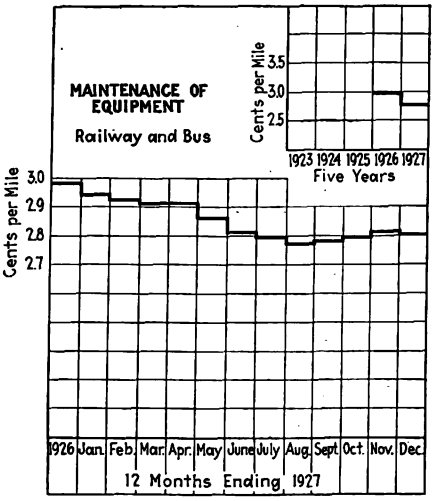
which, from the standpoint of local popular opinion, was in the discard, and the question is, has it been soundly spent and what are the results.

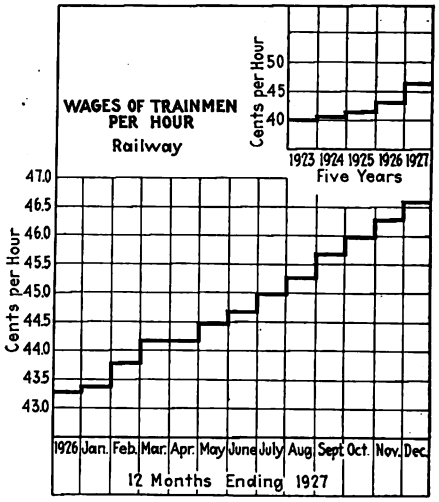
The company is proud of the contribution that it is making to the transportation industry through its public relations and operating achievements, but it is also tremendously proud of the fact that the new money put into the property has brought big returns. The net earnings, after all operating expenses and taxes for the twelve months service ending Dec. 31, 1927, showed an increase of $441,651 over the twelve months period ended June 30, 1925, which increase amounts before depreciation to which, from the standpoint of local popular opinion, was 11.60 per cent on the $3,800,000. This record indicates that the company was not throwing good money after bad and proves again that it pays to modernize.

Wage Policy Brings Lower Unit Cost and Lower Labor Turnover

Extensive use of labor-saving appliances and means for securing co-operation of employees have enabled the company to raise wages and lower operating costs

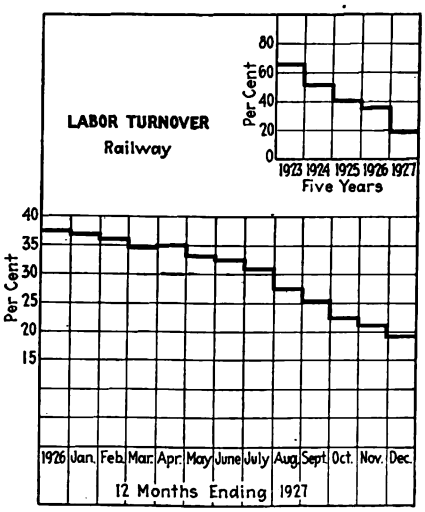






WHEN it assumed control of the Virginia Electric & Power Company in 1925, the present management told its employees that their wages were too low, and if the public was willing to pay more for improved service the men would get their share. On Sept. 1, 1925, two months after taking control, when the Richmond fares were raised from 6 cents to 7 cents, the company announced an increase of 3 cents an hour for trainmen in all of the cities it served. At the same time the hours of both shop men and track men were cut from ten to nine hours a day without change in pay.

On Jan. 1, 1927, following fare increases in Norfolk and Petersburg, the wages of trainmen and other employees were raised 6⅔ per cent throughout the system. The hourly platform rate in 1927 averaged 46.6 cents against 40.6 cents for 1924. The advance is shown in an accompanying graph covering five years.



Unit Costs and Wages in 1927

These charts show (1) cost of maintenance of way and structures per car-mile, (2) maintenance of equipment, railway and bus, per car-mile, (3) a steady increase in the wages of railway train men, all granted voluntarily, and (4) a steady decrease in per cent of railway turnover

The vacation policy also has been liberalized and all monthly employees now enjoy two weeks' vacation with pay.

The employees have reacted to this policy: (1) by giving better transportation service, as shown by the figures and graphs, showing more riders and more revenue; (2) in the rendering of this better service at lower cost through the improved efficiency and economies of operation; (3) in enthusiastically working at all times to attain the company's ideals of service through meeting the highest requirements of individual performance and by whole-hearted co-operation in assisting in those things which promote the general welfare of the company.

Through group meetings and individual contacts involving all employees, the company has endeavored to inculcate in their minds the ideals, requirements and fundamentals of good transportation service and the

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obligations of good citizenship. They are also taught thoroughly to understand the requirements of their jobs and thus shoulder the responsibility that is rightfully theirs of doing good work, whatever the task may be.

Thus trainmen are told they are the contact men of the company and should carry out its ideals that customers receive good service; they should have the ability to merchandise transportation; understand the mechanical and electrical equipment of the car, be able to maintain good schedules, operate the car safely and at a minimum cost, be able to collect fares and issue transfers accurately and quickly, observe the riding habits of the passengers so as to suggest ways of improving the service, and report any defects in the company's rolling stock and overhead lines. The company aims to assist the trainmen in these matters by studies on how to make the service more attractive, means for developing riding, causes of accidents, etc.

Modern Tools Provided for Employees

The same broad policy of helping employees to do their work better is followed with the other departments, as in the shop department, by furnishing them with modern tools and other equipment to enable them to turn out better work. This policy has been of benefit to the company, as well as to the men. Thus, in the way department, the use of modern tools has permitted the company to reduce the number of men in the department, though it has changed their day from one of ten hours to one of nine hours at the same pay per day. In detail:

Sixteen men with hammers and chisels were replaced by four men with air hammers.

Three men with paint brushes and buckets were displaced by one man with a paint gun.

Ten men with cross-cut saws were replaced by one man with a power saw.

Ten men loading rails were replaced by two men and a crane.

Eight men with tamping irons were replaced by four men with air tampers.

Twelve men with hacksaws were replaced by one man with an acetylene torch.

The saving in track maintenance per car-mile effected by modernization is shown in one of the accompanying five-year graphs. Accompanying this record has been an equally gratifying one in increase in mileages between derailments. A chart for the car maintenance department is also shown.

The charts on wages and labor turnover, also published, are further evidence of the liberal wage policy of the company and of the willingness of the men to hold on to an organization that is giving them a square deal.

Incidentally, the employees have purchased a considerable amount of the recent issues of stock of the company. A large majority of them are now stockholders in the company.

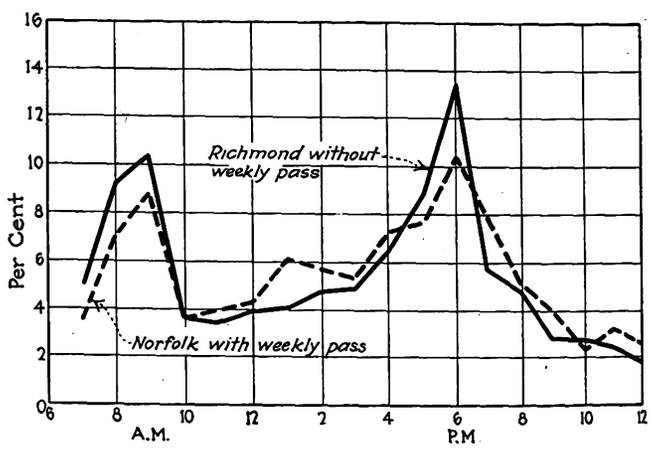
THE foregoing articles, with the two which immediately follow, give the main reasons for the award of the Coffin prize this year to the Virginia Electric & Power Company. Later issues will contain details of some of the most interesting practices of the company in bus, track and car maintenance.

Weekly Pass Helps Load

Comparison of riding in Richmond and Norfolk affords interesting comparison of effect of weekly pass on traffic

RICHMOND and Norfolk, both in Virginia, are very much alike in size, Richmond having about 200,000 inhabitants and Norfolk 177,000. The electric railway system in each city is controlled by the Virginia Electric & Power Company, though as the cities are many miles apart there is no physical connection between the two electric railway systems.

While alike in these respects, the cities differ in others. They are not the same from a traffic standpoint, as Norfolk has a large population of craftsmen, mechanics and laborers, including the United States Navy Yard and shipping workers. Richmond, though also active industrially, has a higher proportion of middle-class citizens



Hourly distribution of railway and bus passengers in and out of the business district, Richmond and Norfolk, 6 a.m. to 12 p.m.

of a more conservative trend. Richmond has 106 route-miles of track and Norfolk 209. Nevertheless, the conditions are so nearly alike as to make interesting results of policies which the company has worked out in a somewhat different way in both cities.

One of the differences in practice is on fares. The Richmond system is on the flat basis, the prevailing rate being 7 cents on the cars and 8 cents on the buses. In Norfolk the fare is 10 cents cash, three tokens for 25 cents, and an unlimited-ride transferable weekly pass for $1.50.

So far as is known, the traffic characteristics of Norfolk and Richmond were not substantially different when neither had a pass, but the accompanying load graph, derived from counts made by company traffic checkers in 1927, discloses quite a difference in load characteristics, the difference being in favor of Norfolk. The better distribution of load, particularly the peak between 12 and 2 p.m., indicates that in Norfolk many more workers go back for lunch than in Richmond. The company attributes this patronage largely to the pass holders. Another difference is the bulge in the Norfolk graph just before the evening peak. This is thought to be partly a "before supper" shopping movement from districts where food stores are not abundant and is attributed to the use of the family pass by the wives of "early to home" workers, who are encouraged to make such shopping trips daily, rather than a couple of times a week.

Again, the early evening load in Norfolk is better, be-

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cause after the supper hour the Norfolk pass holder is more inclined to go to the movies by trolley or bus than the resident in Richmond. He has no extra fare to pay for himself and hardly realizes that he is paying cash or token fares for his wife and children.

Experience with the pass in Norfolk indicates that where a weekly pass is used for 30 rides during the week (a fair estimate for most of them), twelve of these rides are during the morning and evening peaks, as before the use of the pass, but that the other eighteen are off-peak rides.

Another difference shown by the statistics of the two cities is that Norfolk carries more passengers with fewer vehicle-miles. While this reduction in vehicle-miles is largely due to rerouting and unification of services, it is also true that 1927 in Norfolk, as compared with 1926, shows 10 per cent fewer vehicle-miles for more rides. In the opinion of the management, this shows that the extra rides on a pass come, but they can be absorbed without extra cost.

Method for Stimulating Rides

Virginia Electric & Power Company tries various methods with interesting results

METHODS of traffic promotion are apt to follow rather conventional lines. The Virginia Electric & Power Company has made several signal departures even to the extent of giving free rides, on the theory, probably, that "variety is the spice of life" and that the fortunate individual who got his ride free will become so much of a booster for the company that his co-operation was worth the price of his car ride.

This particular form of advertising was known as the "shoppers' free ride special" which was run from 10 a.m. to 4 p.m. every Friday for six weeks in 1927. The novelty was that the person boarding the car did not know a ride was free until he was on the car and received a pamphlet captioned "You're a lucky rider." The public knew, however, that one car on the system was of this character because the company advertised "Watch for the Shoppers' Special" through the newspapers. Of course, a helpful feature of this publicity was that it emphasized the desirability of doing shopping between 10 a.m. and 4 p.m.

Many other free rides were given to citizens of Richmond during the last two years, according to the brief of the Virginia Electric & Power Company filed this year for the Coffin Award, but these free rides were given at the expense of someone other than the company. For instance, a well-known department store, on the occasion of an anniversary of its establishment, advertised to give a car token to any customer who would bring to the store on that particular day a coupon cut from its advertisement in the newspapers. A similar offer was made by one of the principal movie theaters to patrons who brought a special coupon obtained from a car operator and who then bought a 50-cent ticket to the theater.

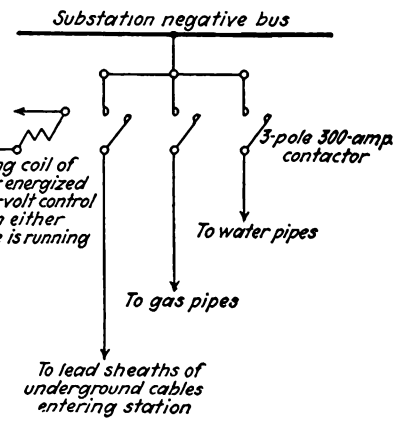
Another instance is that of a manufacturer of shoes, in Portsmouth, who advertises to give a car ticket to any customer who will carry his order home rather than having it delivered.

Another plan of selling tokens to be given away, developed by the company, is to put them up in neat packages of 24 in December for sale as Christmas presents. Such a plan simplifies the problem of presents for many people, because there can be no question as to their acceptability. Everyone can use car tokens. No reduction was made, of course, on the price per token, but the envelope in which they were inclosed is very attractive and carries an appropriate card wishing the recipient the season's greetings.

Automatically Disconnecting Negative Grounds

By J. H. Lohrfink
General Electric Company, Baltimore, Md.

FOUR of the automatic substations of the United Railways & Electric Company of Baltimore do not operate except on load demand. The substation negative bus in each case is grounded to water pipes, gas pipes and the lead sheaths of underground cables entering the station. In view of the fact that there are a number of gas mains and water mains paralleling the negative cables, it was desired to disconnect automatically the negative buses from the grounding circuits when the stations are shut down. If this were not done, the stray currents would attack these water and gas lines to quite an extent, as they would offer a better means for the flow of the negative current to other stations at that time in operation.



The accompanying diagram shows how this was accomplished. Four 300-ampere, three-pole contactors were used, one in each of the four automatic substations. The operating coil of each contactor is energized from the 440-volt control bus when the machine is running. When the machine stops, the coil is de-energized and the contactors open.

Relief From Paving Obligation in Ohio

TEN Ohio electric railways have been granted relief of some character from paving charges, according to a bulletin issued by the American Electric Railway Association and quoted by the Ohio Committee on Public Utility Information.

The degree of relief varies in the cases of these ten companies, which are: Northern Ohio Power & Light Company; Wheeling Traction Company; Cincinnati Street Railway; Columbus, Delaware & Marion Electric Company; Cleveland Railway; Toledo, Bowling Green & Southern Traction Company; Western Ohio Railway; Southern Ohio Public Service Company; Community Traction Company of Dayton, and the Springfield & Xenia Railway.

Some of the companies have been granted only partial relief, while in other cases the relief has been more general and extensive.

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Accountants Discuss Need for Coping with New Problems

Interesting addresses and detailed committee reports show the work of the association in solving the problems of standardization of accounts, bus accounting, price records and depreciation changes. O. H. Bernd elected president for coming year

REALIZATION of the need for solving several important problems now before electric railway accountants created a lively interest in the three regular sessions held by the Accountants' Association. The meetings were characterized by the interesting addresses and reports, and the lively discussions which followed these. The meetings were all well attended and those present showed much enthusiasm in the work being done. They were presided over by O. H. Bernd, secretary Des Moines City Railway, who became acting president of the association with the passing of T. B. MacRae.

The reports of the committees on standard classification of accounts, bus accounting, stores accounting, price records and freight accounting showed definite progress in these important phases of the association's activity for the past year. The reports on bus accounting and depreciation brought forth much discussion, an indication of the importance of these two subjects. Among the interesting papers presented were "Accounting in Steel Works," by Walter C. Bird, assistant to the auditor American Steel & Wire Company, and "Auditing Control in Manufacturing Industry," by F. H. Corregan, assistant general auditor General Electric Company.

On Wednesday, Sept. 26, a joint session of the Accountants' Association and the purchases and stores division of the Engineering Association was held. Stores and pricing problems, common to both groups, were discussed in the several reports presented. An interesting paper, entitled "Pricing Problems," was read by R. A. Weston, special accountant of the Connecticut Company. Following the joint session, a business meeting of the accountants was held, at which officers for the coming year were elected. O. H. Bernd, the acting president for this year, was elected president.

No regular session was held on Tuesday, the day devoted to the inspection of the exhibits, but a "get-together" luncheon was held at the Cleveland Athletic Club, which served the purpose of bringing together the members of the association.

Opening Session on Monday

A moment of silent prayer, a few words of tribute from friends of long standing, and the reading of a resolution on the death of T. B. MacRae, preceded the opening of the Monday session of the association.

O. H. Bernd

After welcoming members of the Accountants Association to its 31st annual convention, Acting President O. H. Bernd expressed a wish to have the incoming administration set a goal of 150 individual accountant memberships in 1929. He stressed the important and effective part railway accounting officers must play in the progress of the industry, and urged that they co-operate with all other departments in seeing that revenues are fully developed. He also pointed out that the association is a clearing house for ideas and experiences. He then commented on the work of the committees during the past year and called special attention to the subject of depreciation accounting. In connection with this subject Mr. Bernd said:

> The sentiment of the industry is not that of objecting to depreciation accounting, but to the imposition of a system of depreciation accounting at this time when the industry—and especially that part of it which reports to the Interstate Commerce Commission—is not in a strong financial position, but just feeling its way back to prosperity.
>
> Depreciation is ultimately an accountancy matter, and those who are handling it in its judicial and economic phases fully realize that the solution of the problem lies in having an enlightened and sympathetic group of accountants and auditors.
>
> Every electric railway accounting officer should realize that he has a more important and effective part to play in the progress of the industry than ever before. The management of his company, the investors, the regulating authorities and the public must rely upon his accurate and sworn statements of his corporation's affairs and needs. He must be an active co-operator with all other departments in seeing that the revenues are fully developed, and that expenses are made for the company's benefit. He must also act as an interpreter for the management of the various current operating accounts, results and statistics, as well as the capital account expenditures and its fixed and current assets and liabilities. In this way he will find that the electric railway accounting profession is placed on a higher plane.

Important Reports Presented

The report of the sub-committee on bus accounting was made by E. A. Tuson, chairman. Two outstanding developments of the last year with respect to bus accounting classification systems have been the adoption by the Pennsylvania Public Service Commission of a definite standard classification and the tentative promulgation of a standard system by the Railroad Commission of Wisconsin. The report calls attention to the fact that the class A specification as finally adopted contains potent major differences from that of the Accountants' Association. First, the item "Taxes" is included as an "Operating Expense" account and "Other General Expenses"

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instead of a separate "Operating Revenue Deduction" group as in the association classification; second, "Rents," for leased properties which entitle the carrier to the exclusive use and possession of such properties are charged as "Other Rents" under "Income Deduction" instead of the various rent accounts under "Operating Expenses" as in the association classifications; third, a separate operating expense group entitled "Depreciation and Amortization" is used, whereas in the association's classification the retirement expense is included under "Maintenance of Plant and Equipment," fourth, but one operating expenses group, i.e., "Conducting Transportation," is used instead of the two groups "Operating Garage Expenses" and "Transportation," as in the association's classification.

Mr. Tuson emphasized in this report the need for a standard measure of the financial result of bus operation. Bus operators, said Mr. Tuson, should have a ready basis of comparison and, as nearly as possible, talk the same accounting language. The same arguments that make it desirable for an individual state commission to have a uniform system of accounts for all utilities of a given class which report to it, apply with equal force to the desirability of having a uniform standard for the entire country. Attention was also called to the additional point referred to in last year's report concerning the adoption of different classifications in the various states, which, it is believed would occasion a duplication of work.

W. L. Davis, auditor Lehigh Valley Transit Company, Allentown, Pa., represented the Accountants' Association at the annual convention of the National Association of Railroad and Utilities Commissioners held in Dallas, Tex., in October, 1927, and his report presented a résumé of matters considered of general interest to the Accountants' Association.

An address on that branch of accounting which deals with manufacturing costs, known as manufacturing accounting, was given by W. C. Bird, assistant to the auditor American Steel & Wire Company, Cleveland, Ohio. He gave a complete description of the accounting system used by his company in the production of steel.

It was shown how the foundation job of preparing the cost of products is performed by the works' accounting organization, and because of certain expenditures and values not available at the works, how the job is completed in the general office. The works' accounting organization consists of seven divisions, a chief clerk being responsible for their correlation. These divisions are weighing, timekeeping and payroll, payroll verification and distribution, stores, production and stocks, freight and receiving and billing.

The speaker supplemented his talk with three reels of moving pictures showing the source of supply of raw materials entering into the manufacture of steel, the manner of producing coke and the mining and transportation of ore.

On Wednesday the Accountants' Association held a joint session with the purchases and stores division of the Engineering Association. The report of this meeting is included in the report of the purchases and stores division.

"Auditing Control" Subject of Address at Thursday's Session

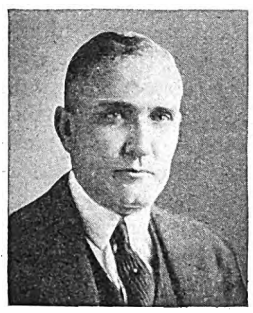
The Thursday session was presided over by E. H. Reed in the absence of O. H. Bernd. Four important committee reports were read and discussed and an address delivered by F. H. Corregan, assistant general auditor of the General Electric Company.

Speaking on the subject of auditing control in manufacturing industry, Mr. Corregan said that the industry with which he is connected has adopted a standard accounting and cost system. This system recognizes four broad fields of industrial activity as a basis for the classification and segregation of financial transactions, namely, research and engineering; selling and distributing; manufacturing; general administrative. There are two general reasons for that segregation: (1) The several fields of activity are ordinarily under the direction of different individuals, and (2) the factors influencing the financial transactions in each field are quite different.

The financial transactions pertaining to each field of activity are divided between revenue and disbursements. The revenue is subdivided according to lines of product and the disbursements are subdivided between expenditures of an investment character and those relating to current operations. Operating expenditures are further subdivided according to the general character of the items of which they are comprised.

The analysis of these various accounts, Mr. Corregan said, while very valuable as a picture of what has happened, would not be fully effective in controlling expenditures principally because it is after the fact. It is very essential that information regarding expenditures be had before they are made, so that judgment may be passed upon the desirability and necessity of making them. In other words, budgets of forecasts which serve not only as a guide in making expenditures, but as bogies for judging them, are most important.

Recognizing that the amount of revenue will be limited to selling prices and that the aggregate will be dependent upon the volume of sales, the first requirement is a forecast of sales. Inasmuch as certain expenditures, principally for plant, must be made today with respect to future business, it becomes important to have a forecast of sales not alone for the ensuing year, but well into the future.



Walter Shroyer

R. A. Weston

M. W. Glover

E. A. Tuson

L. E. Lippitt

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Methods for Reducing Accidents

Command Attention of Claims Men

They also discuss departmental organization and traffic regulation and hear address on recent court investigation of fraudulent claims in New York

WHEN President Joseph S. Kubu of the Claims Association called the opening meeting of the association to order Monday afternoon, Sept. 24, he found himself facing the largest gathering of claims men since the Chicago convention in 1924. The meeting marked the 25th milestone in the history of the association.

Mr. Kubu in his presidential address paid tribute to the men of other years who had carried on the work of the association for a quarter of a century. He declared they had lent courage and inspiration to the men of today. Claims work is no exception to the need for making adequate preparations for following it as a profession, and there is every evidence of the Claims Association lending force in transforming the individual into an interrelated personality, ever widening his conception of his work, President Kubu said. One of the most vital measures under consideration by the Claims Association is the recommendation presented to the executive committee of the parent association asking that body to support the enactment of an "imputed negligence law" throughout the various states. The policy committee of the American Association favorably considered the matter and recommended a committee to work in connection with the Claims Association. He also called attention to the need by the claims departments for especially trained men and to extensions of the safety movement.

J. S. Kubu

John J. K. Caskie, general attorney Philadelphia Rapid Transit Company, read an interesting paper on "Selection of Claims Department Employees." It is Mr. Caskie's opinion that the best men available today for claim work are to be found on the platforms of the street cars. An abstract of his paper will be found on another page of this issue.

In discussing Mr. Caskie's paper, H. V. Drown, Newark, N. J., said that Mr. Caskie's practice closely paralleled his own. In the early years of his claims career, he believed that college men, or at least high school graduates, would make the best claims men, and that a claims school for them should be started. Later, he found that men with considerable book learning did not necessarily excel, and no school of instruction was founded. Recently, in analyzing the makeup of a number of his company's one-man operators who had had perfect records for over a year, he found not one had gone beyond elementary school. The collegian, as a rule, quickly becomes impatient and discouraged at the comparatively slow progress toward a high position and earnings and usually departs after a short experience. Comparing these two types, No. 1, the man of higher education and No. 2, the man with an elementary school education only, or less, on the theory that each came into the world with identical mental and physical qualifications, he found that the men with higher education who were induced to stay in the service have an advantage in dealing with persons of culture and prominence. As investigators they are superior in the making up of reports and phrasing statements and turn in work that the department is proud to exhibit. As adjusters, on the whole, they are not as effective, except in dealing with cultured and prominent persons. The rank and file, with whom most claims dealings are made, are likely to stand in awe of them, quickly sensing their superior training and being in fear that they are not mentally fit to cope with them. This lack of a feeling of fellowship or equality also handicaps this type of employee in securing statements from witnesses as he often fails to get the sympathy of the witness. If this type continues at the work long enough he overcomes much of this disadvantage and is likely to make a better executive.

Type No. 2 makes the better adjuster, either as a beginner or as a seasoned employee. The majority of claimants with whom he comes in contact are of the rank and file and have much in common with him. His use of corruptions of the English language strikes a responsive chord. His dealings with men from his early youth have made him keen and shrewd. As an investigator he is likely to obtain statements where Type No. 1 would fail. The statements may be poorly constructed but they usually contain the essentials and answer the purpose. It is a happy combination to build a department composed largely of men sufficiently educated to have acquired a fair vocabulary and of sufficient practical experience in the world, particularly in dealing with all types of humanity, to round out the organization with the addition of a few of the extreme types mentioned. To counteract the havoc of time, fairly young men should be taken on with the idea of always having a vigorous and virile organization.

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The speaker agreed with Mr. Caskie as to the adaptability of the platform man for claims work, but did not think the department should be made up largely from this type. Some of his own best adjusters are ex-platform men, and some have developed into good investigators, but the speaker did not think the average platform man has sufficient education, particularly for investigating work.

As to the training of the new men, he thought the method generally followed is the proper one. This is first to give applicants completed cases to study in which they can determine by the statements and write-ups largely what is required; then to send them out with experienced men for a while and then put them to work. From then on they should constantly receive instructions so they are really tutored as long as they are in the business.

S. W. Baldwin, general attorney Connecticut Company, agreed in general with Mr. Caskie's conclusions. He listed the requisite qualities of a good claim department employee as follows: (1) A clear and truthful conscience never dormant. (2) An ability to approach unknown people of all sorts in such a way as to create in their minds an abiding confidence in the claim man. (3) A knowledge of transportation and traffic conditions in the locality. (4) A general acquaintance with the people—particularly doctors, business men and lawyers—to determine which are absolutely trustworthy and which are not. (5) A knowledge of the law in regard to transportation accidents. He said that the first is fundamental. The second, third, and part of the fourth, are usually well acquired by the proper sort of a man on the platform. The latter part of the fourth and the fifth are a proper instruction to be given in the claims department itself. His methods of instructing new employees is for them to begin by studying old and rather typical files. When the new employee begins actual work and brings in statements, they should be gone over with him, and his attention called to mistakes and omissions. No matter how long a man has been in claim work, the speaker urged that he should, if possible, be present at the trial of every case he has investigated in its early stages. He will then see what a plaintiff's lawyer does to the witnesses produced by the defense. The speaker also urged that one or more among the younger members of the claim departments be sent each year to the convention. Then after the convention that each company's claim department have an informal meeting or meal, at which those who attended may talk it over with their less fortunate associates—some of whom will be able to attend the following year.

Ambulance Chasing in New York City as Disclosed by Investigation

The latter part of the session on Monday morning of the Claims Association was devoted to the consideration of a paper on the investigation of "ambulance chasing," which has been conducted in New York during the last few months. It was presented by Frank E. Carstarphen, vice-chairman and general counsel of the Citizens' Committee against Fraudulent Claims, of New York City. Mr. Carstarphen gave a review of the recent campaign in New York City against fraudulent claims and told of the whole-hearted support given the committee by bench, bar and citizens alike. A brief abstract appears on another page.

On the afternoon of Tuesday, the day on which there were no sessions of any of the associations, the claims men were invited to inspect the offices of the claims department of the Cleveland Railway. The few hours taken by them in doing so were very profitably spent in the company of Messrs. Kubu and Weh.

At the second session of the Claims Association, a luncheon meeting devoted entirely to informal discussions, about 40 members were present.

L. H. Butterworth, claims attorney Boston Elevated Railway, presented a paper on the public reaction to operation of the Boston Elevated Railway by the state, so far as it affected claims. He said that when the company began operation under the public authority the members of the claim department were rather hopeful that the financial interest of the car riders in the economical administration of the company's affairs would be reflected in a decreasing claim department expense. This hope was doomed to disappointment. The cost of claims and the size of verdicts have steadily mounted, although the number of accidents and claims have shown no proportional increase. This increase in cost is naturally due to other causes than public operation, such as the increased accident hazard due to auto traffic congestion, increase in bus operation, general economic conditions of inflated prices and legislation and Supreme Court decisions making the law more favorable to the plaintiff in negligence suits. In brief, from public operation there has been practically no reaction of any kind so far as claims are concerned.

In the open discussion which followed the reading of Mr. Butterworth's paper, W. F. Weh, Cleveland Railway, said that his company had experienced the same result so far as damages were concerned. He stated that any attempt to dwell in the court room on the subject of the car riders paying the bill was promptly ruled out.

Discussion on Safety

The final session of the Claims Association held on Thursday afternoon saw another record-breaking attendance. A large part of the session was devoted to the reading and discussion of the report of the committee on safety.

In commending the report on safety, H. V. Drown, Newark, N. J., said he was particularly interested in the comments on compulsory insurance for automobile drivers in Massachusetts. Often the railway in cases of joint negligence finds that its co-defendent is worthless, so that the plaintiff naturally collects from the solvent transportation company. Because of the irresponsible driver, also, the company often is unable to collect for damages done its property by automobiles. A penniless driver, driving a worthless car, is apt to be a reckless driver. The speaker also thought that improved traffic regulations would reduce accidents. He approved the "stop street" regulation, which, he said, has come to stay and should be more strictly enforced. He pointed out that reckless driving is not always driving at very high speeds and gave as examples the crossing of a blind intersection at a speed of 25 m.p.h., and blindly turning out of lines of traffic into oncoming traffic. Arrests seldom follow such offenses. He thought that to engender a wholesome respect for the law was an excellent way to educate drivers of motor vehicles.

Wallace Muir took a negative view on this point and again began stumping for concerted action on the part of all claims men for a uniform imputed negligence law. It was his contention that a greater benefit would enure both as to the reduction of accidents as well as the saving of thousands of dollars in damages.

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I. S. Fairty then presented a paper on "Methods of Claims Department Operation in Toronto." An abstract appears elsewhere.

The paper of G. T. Hellmuth on the "Effect Upon Accidents of Automatic Traffic Control Installation and Parking Restrictions" was read by J. W. Seabright. In discussing traffic lights the paper said that the introduction, in 1923, of synchronized traffic signals on Michigan Avenue, Chicago, for a distance of 2¼ miles was followed by some slowing up of the non rush-hour traffic, but in the morning and evening periods of greatest need the avenue was able to handle a steadily moving traffic mass at greater speed and with a most satisfactory reduction in accidents. It is estimated that in little more than a year's time nearly 60 lives were saved. The physician in charge of the receiving ward of a large neighboring hospital stated that the automobile injury cases coming into that institution had been reduced by more than half in number and by more than 50 per cent in seriousness. It is estimated that the introduction of the progressive traffic signal system in the Loop district in Chicago in 1926 reduced accidents there by 20 per cent.

In Detroit the traffic lights were first in general use in the downtown area in 1926. The fatal and personal injury accidents in this area had shown an increase in 1925, compared with 1924, of 56 per cent, but in 1926, compared with 1925, there was a decrease of 3 per cent, and in January and February, 1927, a decrease of 9.5 per cent, compared with the previous corresponding months. In parts of Cleveland the lights have speeded car schedules 20 per cent and automobile movement 30 per cent. In East Cleveland automobile accidents were reduced from 369 in 1925 to 155 in 1927, in the face of the usual increases in machines operated.

As to parking regulation, on January 10, 1928, parking was prohibited in the Chicago Loop area between 7:30 a.m. and 6 p.m. from Monday to Friday and from 7:30 a.m. to 3 p.m. on Saturdays. Six months later it was found that traffic had been speeded up 10 per cent in the non-rush hours and 14 per cent in the period between 4:30 and 6 p.m. Accidents in the Loop area have been reduced about 30 per cent.

In Cleveland, as a result of the enactment of an ordinance forbidding parking on main thoroughfares during rush hours, there were 900 fewer accidents in the six months following the ordinance as compared with the same six months of the year previous.

Officers elected to serve for the ensuing year are as follows:

President, L. F. Wynne, Georgia Power Company, Atlanta, Ga.

First vice-president, Walter E. Robinson, Cincinnati Street Railway, Cincinnati, Ohio.

Second vice-president, C. E. Redfern, United Electric Railways, Providence, R. I.

Third vice-president, W. E. Foley, Third Avenue Railway System, New York, N. Y.

Secretary-treasurer, J. W. Welsh, American Electric Railway Association, New York, N. Y.

Executive committee: the officers and the following members-at-large: L. H. Butterworth, Boston; Seth W. Baldwin, New Haven; J. W. Giltner, Akron; Trevor C. Neilson, East St. Louis.

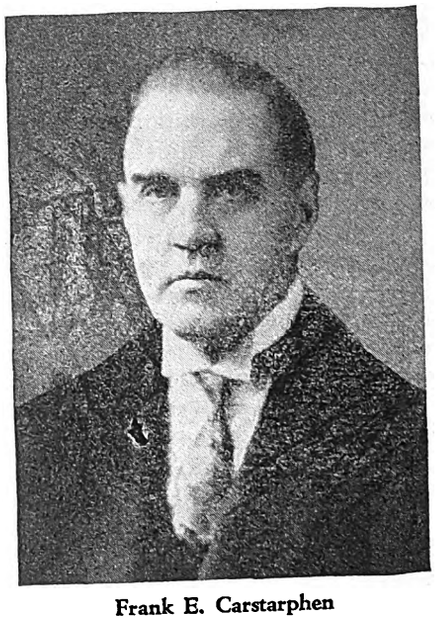
In turning over the gavel to Mr. Wynne, Mr. Kubu, the retiring president, spoke feelingly of the co-operation he had enjoyed in carrying on the work of the association during the past year.

Ambulance Chasing in New York Exposed*

Genesis of the movement that resulted in the information of the citizens' committee against fraudulent claims and hearings on the evil by justices of the Appellate Divisions of the Supreme Court

By Frank E. Carstarphen

Vice-Chairman and General Counsel Citizens' Committee Against Fraudulent Claims, New York City



Frank E. Carstarphen

IN THE late spring of 1927 a committee of lawyers appointed by Hon. Victor A. Dowling, presiding justice of the Appellate Division of the Supreme Court for the First Judicial District, investigated the conditions of the calendars of the courts of record of New York County and reported a tremendous congestion of cases awaiting trial. Its survey indicated that negligence actions composed the majority of the many thousands of cases pending and that in a single month such actions to the number of many hundreds had been filed by four or five attorneys, one attorney alone having started nearly 400 suits in that time.

During the period of this committee's investigation and later, the New York *Evening World* and the Brooklyn *Eagle* attacked the evils of the contingent fee system, publishing exposés of ambulance cases, and the *Panel*, a monthly bulletin of the Association of Grand Jurors in New York County, urged that concerted action be taken to find remedies to prevent these evils. Then a group of public-spirited citizens, headed by Robert Appleton, president of the Association of Grand Jurors in New York County, organized a committee known later

**Abstract of a paper presented at the annual convention of the American Electric Railway Engineering Association, Cleveland, Ohio, Sept. 22-28, 1928.*

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as the "Citizens' Committee against Fraudulent Claims." This committee soon had an enrollment as associate members, thousands of citizens, including representatives of the interests most directly affected, such as stock casualty companies, mutual casualty insurance companies, steam railroads, local transit and taxicab companies, food manufacturers and distributors, real estate companies, etc. This committee, with the assistance of the press, carried the burden until several bar associations filed in the Appellate Divisions of the Supreme Court for the first and second judicial districts (New York County and Brooklyn), petitions for the investigation of the deplorable conditions which had been exposed.

On Feb. 14, 1928, the Appellate Division of the First Judicial District handed down an opinion designating Judge Isidore Wasservogel to sit in a series of hearings to be held under the order of the Appellate Division, and the Bar Association for the First Judicial District designated Isidore J. Kresel as the attorney to investigate the complaints and to present testimony in private and public hearings before the court. In the meantime, the Appellate Division of the Second Judicial District designated Judge Leslie Faber to sit in hearings in that district, though this investigation was to be conducted privately. In this respect the procedure differed from that of the hearings conducted before Judge Wasservogel.

The public investigations continued from Feb. 20 to July 20, 1928. During this time the insurance companies and others interested prepared and sent to the attorneys in charge of the several public investigations schedules containing the names of those attorneys who within the previous three years had been most active in instituting suits against them, the titles of the cases, the amount of adjustments or settlements, etc. Using these lists as a basis, the attorneys examined numbers of witnesses, as a result of which many valuable data were obtained upon which to base future action. The hearings under Judge Wasservogel were completed about the middle of July, although a few hearings were held in early August. Judge Wasservogel is now engaged in drafting his report, which is to be submitted to the Appellate Division of the First Judicial District on the first Tuesday in October.

What May Be Done

It is easy, of course, to criticize any existing evil but sometimes more difficult to devise a remedy or do something constructive in the way of legislation to prevent its recurrence. It is expected, however, that Judge Wasservogel will not only point out flaws in existing laws or rules of practice, but will indicate how, in his opinion, such laws can be changed to protect society against the evils which have been exposed. It is expected also that the report will cite the names of a number of attorneys-at-law against whom disciplinary measures will be recommended. Already testimony against more than twenty has been sent to the office of the district attorney of New York County, and indictments have been returned against about one-half that number. These figures do not include the large number of lawyers' runners and physicians against whom testimony was adduced at the hearings, for the reason that the Appellate Division of the Supreme Court has jurisdiction only over attorneys. This does not mean that the other persons mentioned will escape unscathed, though action against them will have to be from other sources.

Exceedingly interesting testimony was taken during the closing days of the hearing, wherein representatives of local traction companies, insurance organizations and others reported a great decrease in a number of negligence suits filed against them since the beginning of the hearings, and the chairman of the joint committees of the Bar Associations said that in his opinion ambulance chasing cases brought in the New York Supreme Court had decreased 43 per cent in number.

Fixed Maximum Fee Suggested

During the hearings a number of constructive suggestions were made. Thus, William D. Guthrie, president of the New York City Bar Association, suggested that compensation in accident cases should be fixed along the principle of the workmen's compensation law. While he thought that the contingent fee could not be entirely dispensed with, he believed a maximum should be fixed by law. He thought 20 per cent would be proper generally, whereas, under the present system, the fee is frequently 50 per cent of the amount recovered. The law on perjury should be changed to give power to the judge before whom perjury is apparently committed to pass judgment on it immediately, with the right of review and appeal reserved for the defendant. The purpose of this suggestion was to have prompt and effective enforcement against this crime. Mr. Guthrie also argued in favor of increasing the requirements for admission to the bar.

The point should be understood that the hearings so far have not been a series of trials. No one has been a defendant nor has there been an accused person at the bar. The hearings have been in the nature of a "preliminary investigation," undertaken by the court which has both inherent and statutory control over the conduct of lawyers, such an investigation being ancillary to its power to disbar and discipline. It is impossible to anticipate the suggestions to be made by Judge Wasservogel, but if he should cite any individuals for discipline, proceedings against them would have to be instituted *ab initio*.

The situation of the inquiry before Judge Faber is somewhat different, in that a smaller number of attorneys were found implicated in ambulance chasing. As to these, a preliminary report has already been made by Judge Faber and proceedings are now under way before a referee appointed by the Appellate Division, while in other instances indictments have been sought and found.

Some fear has been expressed that unless proper precautions are taken, something like the old conditions may return. It is the purpose of the Citizens' Committee against Fraudulent Claims to see that the good work is continued.

Furthermore, there should be a differentiation between the kinds of perjury that are committed. The difficulty now is that, first, it is very difficult, under the definition of perjury in most penal statutes, to secure an indictment and, secondly, the penalty is so severe that juries usually fail to convict. Why not divide perjury into two classes, making one a misdemeanor and the other a felony, and take into consideration the fact that a man who swears falsely in applying for a dog license is not quite so bad as the one who deliberately and with malice aforethought, during the trial of a case in court, falsely swears after being warned? Apply the rule of reason to the statutes on perjury and I believe you will have more indictments and more convictions for perjury than are now possible.

Another suggestion is that the trial judge address in a solemn manner every witness that appears before him, explaining the need for testifying truthfully and explaining to the witness the penalties of perjury.

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Claims Department Operation in Toronto*

Many favorable conditions. Ontario courts follow civil law doctrine of division of fault instead of common law. Injuries expenses low

By *Irving S. Fairty*
General Counsel Toronto Transportation Commission, Toronto, Canada

TORONTO is a city of 570,000 population, but with the tributary suburbs it constitutes a community of, roughly, 750,000 persons. About seven-eighths of this population is Anglo-Saxon or Celtic in origin, a circumstance which will probably be conceded to be an advantage from a claims standpoint. There are few grades of consequence to be overcome by the street railway, and steam railway grade crossings are practically non-existent. On the other hand, although there is a motor car for every six of the population, the principal downtown streets are only 66 ft. in width with 42 ft. roadways.

The Toronto Transportation Commission has complete control of the transportation system of the city proper which it serves by street cars and feeder buses. It also operates through a subsidiary company coaches for sight-seeing and chartered work, a de luxe special fare system of motor coaches and motor coach routes to outside points, as far in one case as Buffalo, a distance of 100 miles. Under arrangement with suburban municipalities it operates at cost six separate street car and bus services in such municipalities. It also operates interurban railways 67 miles in length and the ferries between Toronto Island and the mainland.

By far the bulk of its roadbed and equipment is either new since 1921 or has been substantially rebuilt, and all of its rolling stock is now equipped with the latest safety devices. Our trainmen, from the standpoint of neatness, courtesy and operating skill, set a very high standard, a fact which not only bears upon the number of accidents but is of substantial advantage to us in our relations with the public. Our management does not believe in the bonus system for accident prevention. Rightly or wrongly, it feels that men should not be rewarded for doing their duty and that a strict but fair discipline is the best way to secure a comparative freedom from avoidable accidents. On the other hand, every effort is made to encourage the organization's *esprit de corps,* by such methods as a house magazine, a band, competitive sports, concerts, picnics, etc., and more important from our standpoint, by instruction in first-aid work. Over 1,100 men have passed first-aid examinations, the commission paying for the time spent in attending the necessary lectures.

There is a justifiable public confidence in our system of administration of justice in Canada. For the past three years we have had in Ontario in contributory negligence cases the civil law doctrine of division of fault and damages in place of the common law doctrine that contributory negligence completely bars a plaintiff from recovery. I own that I had substantial misgivings as to the expediency of the change but I am now of the opinion that natural justice is more nearly served by the new rule and I question if defendants do not on the whole gain by its adoption.

Irving S. Fairty

The type of legal practitioner known as the ambulance chaser is absent from our city. I do not know that members of our legal profession are any more ethically disposed than in other cities or that the temptations in the path of the young and impecunious lawyer are less, but the discipline of our profession is left entirely in the hands of the profession itself through elected Benchers and this body has always largely succeeded in maintaining a high standard of professional conduct and ethics. It may also be said that the medical profession in Toronto seems to be successful in guarding itself against its black sheep. So in our claims work we have many extremely favorable surrounding conditions, but this does not prevent us from being at times extremely busy.

Under our organization scheme the claims work is made a branch of our legal department and, while our experienced supervisor of claims and his competent as-

**Abstract of a paper presented at the annual convention of the American Electric Railway Claims Association, Cleveland, Ohio, Sept. 22-28, 1928.*

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sistant are in practice given a free hand in the conduct of their work, we feel that the arrangement in question, insuring as it does close and continuous legal co-operation whenever necessary, has much to commend it. Incidentally, for reasons which this association has had elaborated before it, the title of "Claim Agent" was discarded some time ago for that of "Supervisor of Claims." The balance of the staff of the claims branch comprises a chief clerk, eight investigators, two salaried part-time physicians, and the necessary stenographic assistance. All the investigators have been with the organization a substantial period. They are men of mature age, this being a distinct advantage for this occupation, but only two came with any special qualifications for their positions.

In all our contacts with the public fair dealing is continuously our watchword. We aim to pay all just claims and believe that square dealing to others breeds in return square dealing from others. A necessary corollary of fair treatment to others is fair treatment to oneself and we impress upon the public with whom we come in contact that we will not be willingly imposed upon and that we will resist with all the resources open to a wealthy corporation any extortionate and improper claim. A settled claim means the preservation of amicable relations, litigation, usually bitterness and ill will, no matter what the outcome. And we in Toronto often especially strain a point to keep on the best of terms with what were formerly regarded as the three learned professions, the lawyers, the physicians and the clergy. The idea of maintaining especially the good-will of the gentlemen of the cloth may be regarded as novel, but most will agree that in view of their large circle of influence it is not out of place to cultivate such good will.

To come to the actual machinery in use with us for handling accidents and claims we may say that serious accidents are reported by the crew or the first inspector they meet, during office hours, to a special telephone in the claims office separate from the main switchboard, and after office hours to the main switchboard to be relayed to the supervisor of claims or his assistant at their residences. All accidents, serious or trivial, must be reported by trainmen immediately on signing in, on forms supplied at the divisions. These forms are copied by clerks at the divisions for the use of the operating department but the originals are sent at once to the legal department for attention. Failure to report an accident, even if trivial, is treated by our operating department as a very serious offense.

When a report is received by our claims department of an obviously serious accident our first step is to insure adequate hospital and medical treatment for the injured. The occurrence is then given whatever investigation is necessary. Only in exceptional cases is any effort made to interview an injured person or his family, for our experience leads us to believe that the motives for seeking such an interview are usually misinterpreted. Nor will we as a rule discuss settlement with a person still suffering from injuries. If he expresses a desire to open the subject he is told that we will be very glad to discuss the matter with him at our office on his recovery. Further, we make no effort to influence or cajole a claimant into a settlement and frequently advise married women who are willing to settle to discuss the matter with their husbands first. Almost invariably the wives return stating that their husbands approve of the settlement.

1927 STATISTICS

	T.T.C.	Gray Coach Lines, Ltd.	Total
Revenue-passengers	201,748,884	2,227,526	203,976,410
Car-miles	28,764,561	1,346,509	30,111,070
Total revenue	$13,190,439.61	$570,994.23	$13,761,433.84
I. & D. expenditures (including overheads)	$121,062.78	$17,261.19	$138,323.97
Percentage of total revenue	0.92	3.02	1.005
Accidents reported	6,752	446	7,198
Claims made	1,001	185	1,186
Claims settled in first instance	479	131	610
Claims repudiated in first instance			576
Repudiation acquiesced in			461
Settled after first repudiation			53
Action brought in			62
Total			576
Actions settled before trial			18
Verdicts for commission			16
Verdicts against commission			10
Plaintiff has failed to bring to trial			18
Total			62

This system may not be adopted by all transportation companies but we feel it can be defended on psychological grounds. The old idea of the claims man hurrying to a hospital with a roll of bills is still surprisingly prevalent and a claimant is frequently taken aback to discover that a company is not hastening to settle. He may wonder whether such a detached attitude does not spring from a well-merited confidence in the company's position.

When we find it necessary to repudiate a claim we try to act in no dogmatic or arbitrary manner. Apart from disclosure of the names or number of our witnesses we are always willing to discuss fully the details of an accident with a claimant and to try to convince him that, while his statement of the facts may be perfectly correct, we have to proceed upon the weight of testimony which is against him.

The investigation of accidents is by personal call of an investigator. Our experience of investigation by mail has not been sufficiently satisfactory to warrant its adoption except in the case of out-of-town witnesses in relatively unimportant matters. The investigator takes notes of a witness's statements and afterwards transcribes them in longhand and attaches them to the file. Of course every effort is made to see that these reports are uncolored, for a report biased in our favor would be very greatly to our detriment in the average case. Except in a very important case no effort is made to secure signatures to such statements, as they are rarely repudiated.

When action is brought in the courts as a result of a repudiated claim the matter becomes more the care of the legal branch than the claims branch. Prior to the trial we have in Ontario a right to examine an opposing party on oath for discovery and as a result of the enlightenment obtained thereby many actions are settled out of court which would otherwise go to trial. On the whole we have a surprisingly small number of cases which actually reach the courts.

There is one further matter that may be of interest. We believe in collecting from others for damages to our equipment. This work is done by a general utility inspector attached to the operating department, it not being considered good policy to have him in the claims branch. However, we try to maintain close co-operation with him in his work and when, after failure to collect, he requests the legal department to take action, conference is always had with the supervisor of claims before such action is taken, to insure its advisability from a standpoint of policy.

Some statistics of the claims branch for 1927 are given in the table above.

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How May New Claims Men Be Recruited?*

By John J. K. Caskie
General Attorney

Philadelphia Rapid Transit Company, Philadelphia Bus Lines, Yellow Cab Company of Philadelphia, International Railway of Buffalo

John J. K. Caskie

DURING the last decade, through the ever increasing use of automobiles, a mass of negligence litigation and accident claims has arisen greater in the aggregate than those of the street railway companies. We no longer occupy the predominant position in the courts that we once had although we are still the most important single litigant. The accident insurance companies, in the growth of their business, have absorbed many of our trained men, without providing us with a new source from which we can draw.

The striking characteristic of the best type of street railway employee is a peculiar loyalty and devotion. These qualities are even more important than the shrewdness and discretion required in our business. When employing trainmen, we choose vigorous men to cope with present-day traffic conditions. They are schooled in the mechanical construction of our cars and in their operation, as well as in strict rules of discipline. They are also taught to make use of a courteous and tactful approach to all sorts of people.

The trainman who takes a car out on the streets, especially if he is a one-man car operator, undertakes the responsibility of transacting a business independent in its character, although subject to strict rules of operating discipline. His work develops that initiative and good sense which helps to overcome difficulties and he comes to look upon the discharge of his duties as a personal responsibility. He meets so many tricky people that he finds himself continually defending the company while he is serving it. As a rule, every man becomes devoted to anything over which he has to exercise a protective care, and this is true of our trainmen.

A trainman, moreover, when he leaves the school of instruction and goes on the extra list must bide his time until he can earn a favorable run. He has to report early and late, and this also is essential discipline of a claims department employee. If, then, we check up the special qualities required in the claims business, we find it calls largely for the qualities of discretion, good judgment, persistence, patience, loyalty, vigor, shrewdness and discrimination which tend to become developed by a trainman.

When selected for the claims department, such a trainman should feel that his transfer is a promotion into a field where he will have wider opportunities and that his selection is an especial recognition of merit. This should insure us a good, satisfied employee for a long period of service.

The trainman selected may have had some experience with our courts and juries through appearance as a witness in accident cases. If not he should be made acquainted with court machinery when he starts in on current investigating work. Afterward it may be desirable to assign him to duty as a depot accident clerk. Then he is ready to start in on the grind of the current investigation desk, the adjuster's desk, the court investigation desk and the special investigation desk, as his qualities and the necessities of the department may require.

Opportunities for College Men

Colleges and universities have not, as yet, turned to our claims departments as a field for their graduates, though it should provide an opening to, and good training for, the career of a trial attorney. It should also provide a stage in the development of a street railway executive to that exceptionally intelligent and dependable university student who, if wise, will also work on the platform and on the roadway. But, in general, we find the college student impatient to be on his way to the end of his career and chafing at the slow and arduous discipline required in our work. Unless he sees a way clearly pointed out to him to a position of importance which he can attain without too great delay, we cannot expect that long and efficient service which we may expect from the man who comes up from the platform.

Desirable material can sometimes be had from other departments of a street railway, but we do not often find such men.

A list of the desk men in the claims department of the International Railway shows a great variety of previous occupations. One very efficient and dependable desk head started work as a bottler in a patent medicine place conducted by a woman clairvoyant doctor. A desk head in the Philadelphia claims department once worked as a book agent and lightning rod man up and down the Mississippi River. Another most respected and reliable man emerged through all of the devious ways of street fairs, carnivals and summer amusement parks.

It will be seen that although I think the best material is our platform men, I have a latent feeling that along with them we should have a seasoning of Huckleberry Finns and Tom Sawyers, that is to say, the lightning rod salesman, the book agent, or whatever the present-day equivalent to Huckleberry Finn and Tom Sawyer may be.

*Abstract of a paper presented at the annual convention of the American Electric Railway Claims Association, Cleveland, Ohio, Sept. 22-28, 1928.

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Inactive Stocks*

By A. S. Duncan

Assistant Director of Finished Stock Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

EFFICIENT stock-keeping methods, while they may vary as to details of operations in different lines of business, are all based on one fundamental principle—that is, to have material in stock to supply the demand when needed only—no surplus. By this method the investment, labor for handling, and storage costs would be reduced to a minimum. This principle, while theoretically sound, is recognized as practically a physical impossibility, and will continue as such until the world has arrived at a complete standardization and improvements and expansions have reached their maximum.

Recognizing that advancements will continue, it means that a minimum amount of stock must be carried over actual withdrawals so as to service anticipated needs, take care of delays due to manufacturing, transportation delivery difficulties, other delays in ordering regardless of cause, etc.

In ordering this extra stock for servicing purposes, it must be recognized that there is an investment situation which will financially cripple different organizations if it is not reduced to a minimum and kept in as liquid a condition as possible.

By taking a specific account and comparing the total issues to the total amount in stock and have it show a fair rate of turnover, does not signify by any means that the account is in a healthy condition; in fact, it may show just the opposite when a detail study is made of all the individual items of which it is composed, as some of the very active accounts which are being replaced by "shipments into and issues out of" on a weekly or semi-weekly basis will, naturally, carry a lot of material for an indefinite period that has long passed the obsolescense stage.

It behooves all who are in any way responsible for the ordering, storing and distribution of stocks, regardless of lines, to scrutinize thoroughly each item of their accounts one or more times each year, and by means of a predetermined penalty system set up some method whereby the inactive content will be reduced to its actual book value so that in the eventual disposition of this stock you will have taken your losses by easy stages instead of dropping from a 100 per cent book value to scrap. In addition, it is but fair to assume that where an error is known, efforts will be concentrated first, to utilize this inactive stock, even at an additional cost over new material, and second, use past experience to prevent a reoccurrence.

Inactive stock is interpreted as material on hand one year or more, of which the quantity on hand at a predetermined date is in excess of a two years' supply, based on the preceding twelve months' activity.

From a manufacturing standpoint, the following penalties are applied: The first time material comes under the inactive classification it is penalized 10 per cent; the second time an additional 20 per cent; the third time 50 per cent of the remaining value. This makes a total of 64 per cent in penalties. If reported for the fourth time, the material is arbitrarily disposed of by scrapping or dismantling.

A. S. Duncan

Penalties of any kind are not effective unless they are charged to the division or department responsible for the ordering of the material.

If these penalties are so classified that the different interested operating branches would know that they were absorbing certain indirect expenses, it would not only be productive of results from a supervisory standpoint, but from an interest standpoint of those operating heads who heretofore did not take any interest except in a passive way, assuming that their charges, if any, were small and considered them as a part of the hazard of the operation.

At a predetermined period each year each stocking point checks each item in their accounts and those having reached the inactive stage are reported on Form 11734 as shown in the accompanying illustration. Three copies are made of this report—one original and two carbons. The original and first carbon are sent to headquarters; the second carbon is retained by the office making out the report.

After all field inactive reports have been received at headquarters, they are thrown together with the plant reports of the same class of material; first laid out according to lines of apparatus; next put in numerical order by style numbers, or description; then separated and handled as follows:

The original is compared with the book account at headquarters' stocking point. From this it is deter-

**Abstract of a paper presented at the annual convention of the American Electric Railway Engineering Association, Cleveland, Ohio, Sept. 22-28, 1928.*

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Form 11734-B W. E. & M. Co. Printed in U.S.A.

INACTIVE STOCK REPORT

TO EAST PITTSBURGH — FROM CINCINNATI

Stock Control (2 copies) — Date 12-31-26

☐ District ☐ Consigned ☐ Zone ☐ Service — Schedule No. 1-3921

City CINCINNATI — Identifying No. # 107809

Customer (If Consigned)

Description MOTOR COMPLETE

DATES: Received 10-29-27; Prior Reports 12-31-26; Last Sale 11-20-26

SALES: Year / Quantity — 192 5 — ; 192 6 2 ; 192 7 0

Quantity in Stock 5 — Is this material required in your stock? Yes ..... No X

If so, how many? ..... Why? .....

Signed .....

To be filled in by Headquarters

Carried in Stk.: D. O.'S. ✓ Wks. Shipping ✓ Wks. Mfg. Sec.

Class: Standard ✓ Obsolete, New ..... # .....

Special—Same as ..... # ..... Except .....

Activity: 1-Yr. 0 2-Yrs. 5 East West South Central ✓

Listed: Wks. Ledger by Hollan Cross Referenced by .....

Substitute For: ..... # ..... or ..... # ..... or ..... #

Disposition: Held for D. O. Orders ✓ Reconnect—Change for Sale as ..... #

Return to Works Scrap Quantity ..... All .....

Comments: Depreciate & Hold

Approved: Chem Stk. Controller Haysenfor 4 Hdqrs. Sales ..... Supervisor

DEPRECIATION

Prior Date	%		%	Quantity	Value Each	Total Value
12-31-26	10	Present Value		5	$ 10.00	$ 50.00
		Depreciate	20	5	2.00	10.00
		Depreciated Value		5	8.00	40.00

Final Disposition .....

Signed A. G. Burns

A sample inactive stock report form

Form 12961 W. E. & M. Co.

STOCK RECORD

Schedule No. 1-3921 Style No. 107809

The following obsolete, inactive, excess, special or semi-special apparatus in Works and Field Stocks must be used before applying the above style, except as approved by Stock Control Supervisor.

Date Reported	Quantity Inactive or Obsolete	Quantity Excess	Style No. or S. O. No.	Difference From Standard, If Any	Location	Applied To	Date App.
7-2-26	7	107809			Cincinnati		
12-31-26	5	107809			Cincinnati		
12-31-27	5	107809			Cincinnati		

Return this report to Stock Control Supervisor when all items have been applied.

Printed in U.S.A.

A stock record form

mined whether the material is actually inactive or whether it is improperly located. If the stock at headquarters shows that it is inactive, both plant and field stocks are penalized, following the penalty rule of 10, 20 or 50 per cent. After penalties have been assigned a journal entry is made and sent to the accounting department reading: "Charge loss on material scrapped and depreciated (location point) and credit the individual stock accounts."

The accounting department then re-charges this into the operating expenses of the different location points.

The carbon copy, in the meantime, has been turned over to the ledger man handling the account at headquarters. He compares it with his account and, if he has any unshipped orders, his account is credited and the field location point notified to ship the frozen material to the requisitioning point f.o.b.; the freight to be absorbed in the selling expense of the shipping office. If, however, there are no open orders, he posts this on Form 12961 which is shown in accompanying illustration, attaches it to the ledger account, and applies it on the first order received.

One of the surest and most effective ways to reduce inactive stock is to dispose of it before it reaches that stage. For this reason an "Excess Report" is used, which is nothing more than a request from the field point to headquarters to help them move material which for some reason has been ordered in excess of actual requirements. Very often by an expenditure of extra transportation and handling material will never reach the inactive stage but will be used very shortly after it has been reported.

The accompanying figures which illustrate losses resulting from inactive stock are based on using 5 per cent of the total stock as coming under the inactive content rule, which, if anything, is low for the first time the rule is put into effect.

By taking the inactive content, using the year 1927, 55.6 per cent of the total, or $118,000, would come under this caption; $43,563, or 20.5 per cent under the second depreciation period; $50,787, or 23.9 per cent under the third period; or a grand total of $212,500.

Under the "depreciation charge," however, if the first year content is moved or used between the first and second period, there would be a saving of $36,796, to say nothing of $28,450 that would be removed from the scrap content.

Also, once material is scrapped the salvage content is rarely over 1 per cent of the original value, except on non-ferrous material, and even that is questioned if the labor cost of salvaging is properly considered.

In closing, a stock in excess of the daily requirements of one's operating department is an expense that can only be fully determined by some method of determining depreciation, and, in the foregoing, will safely meet the average condition of the street railway operations.

INACTIVE STOCK

CALENDAR YEAR		1926	1927	Increase (+) Decrease (-)
STOCK BALANCE	Location A	$2,000,000	$1,750,000	$250,000 -
	Location B	3,000,000	2,750,000	250,000 -
	TOTAL	5,000,000	4,500,000	500,000 -
INACTIVE STOCK	Location A	$ 100,000	$ 87,500	$ 12,500 -
	Location B	150,000	125,000	25,000 -
	TOTAL	250,000	212,500	37,500 -
DEPRECIATION	Location A	$ 22,480	$ 19,936	$ 2,544 -
	Location B	33,720	28,480	5,240 -
	TOTAL	56,200	48,416	7,784 -
SCRAP LOSS	Location A	$ 22,846	$ 11,715	$ 11,131 -
	Location B	30,346	16,735	13,611 -
	TOTAL	53,192	28,450	24,742 -
TOTAL LOSS	Location A	$ 45,326	$ 31,651	$ 13,675 -
	Location B	64,066	45,215	18,851 -
	TOTAL	109,392	76,866	32,526 -

- YEAR 1927 BY PERIODS -
INACTIVE CONTENT

PERIOD	1 - 10%	2 - 20%	3 - 50%
Location A	$ 48,650	$ 17,938	$ 20,912
Location B	69,500	25,625	29,875
Total	118,150	43,563	50,787
% Total -	55.6	20.5	23.9

DEPRECIATION CHARGED

	1 - 10%	2 - 20%	3 - 50%
Location A	$ 4,785	$ 4,146	$ 11,005
Location B	6,835	5,924	15,721
Total	11,620	10,070	26,726
% Total	24.	20.8	55.2

Figures indicate loses resulting from inactive stock

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The Readers' Forum

Hamburg Uses Reinforced Concrete Track

HAMBURG ELEVATED RAILWAY
HAMBURG, GERMANY, Aug. 25, 1928.

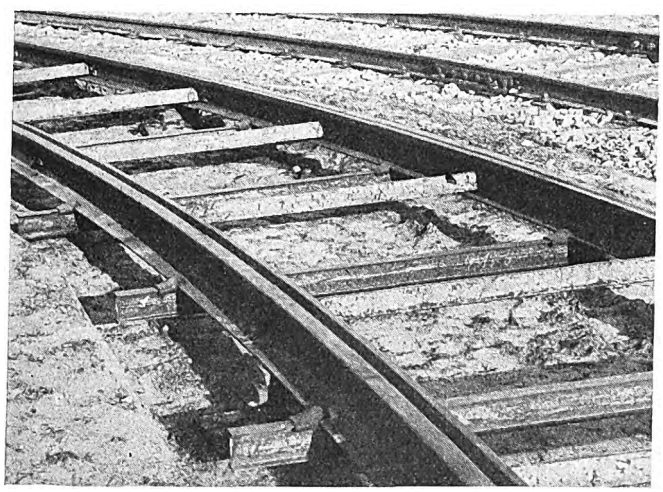
To the Editor:

In the article on "Concrete for Street Railway Track," by C. C. Boone, in your issue of Aug. 4, 1928, I see that the Cincinnati Street Railway is using a system of track construction in concrete very similar to that of the Street Railway Department of the Hamburg Elevated Railway. Steel I-beams have been satisfactorily used by us to anchor track in concrete for several years. At first we employed the same method to attach the rail to the tie as in Cincinnati, namely by clamp plates and bolts. We found, however, that the method was rather slow and also that during the laying of the rail some of the attachments would become locked. Our engineer of track construction, Mr. Weltzien, thereupon designed a cast-steel clamp which we have since used. It permits the connection of the I-beam with the rail to be made quickly and reliably. From the sketch of the clamp and the picture of a section of track on a curve, the construction, as well as the method of attachment, can be observed.

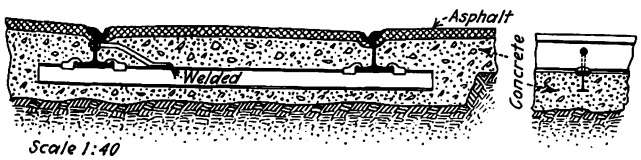
At certain points, particularly on sharp curves, this clamp is supplemented on one side by a rail brace, as shown in the second drawing. These rail braces are attached to the I-beam by welding and to the rail by two bolts. Besides the strength they give, they help the track gang to adjust the gage during the process of track laying.

I am forwarding this information with the thought that this construction may be of interest not only to the Cincinnati Street Railway, but possibly to other American street railways which are using similar construction.

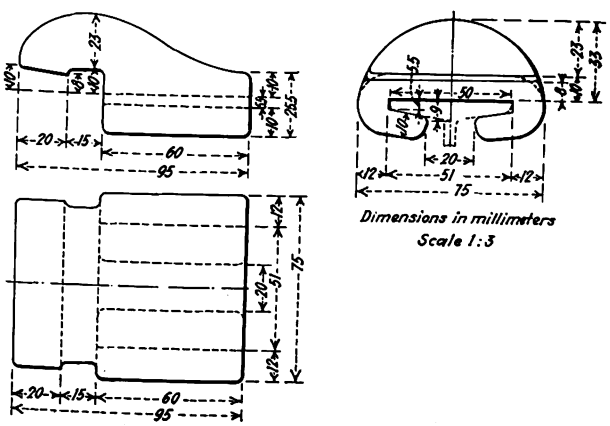
C. WALTHIER,
Manager.



Reinforced concrete track construction with I-beams used in Hamburg, Germany



Section of Hamburg track



Clamp used in I-beam track construction

World's Largest Escalator System

ELEVEN escalators will be installed at the new station of the London Underground Railway in Piccadilly, according to a recent decision. This is more than in any other individual railway station in the world. Five of the escalators will lead down two shafts to a common landing. The remaining six will branch off from there in different directions to serve the Bakerloo Railway and Piccadilly. Railway platforms—both sections of the Underground system.

When this installation is completed there will be 76 escalators installed on the Underground system, in comparison with 21 four years ago. The number of elevators has been reduced during the same period from 208 to 160. The huge reorganized station at Charing Cross will have eight escalators instead of five.

The elevators of the London Underground system make altogether an average of 63,000 journeys per day, traveling 800 miles. The escalators, although they are fewer in number than the elevators, cover in the aggregate more than 1,500 miles in a working day of twenty hours.

Both the lifts and escalators rarely break down, owing to the care they receive. A staff of 250 men is constantly inspecting and repairing them. The mechanical equipment of the lifts is overhauled every seventeen weeks and the electrical equipment every six to ten weeks. It has been the experience in London that the escalator needs very little attention the first year. Afterwards its mechanical equipment is overhauled every seventeen weeks and its electrical equipment every eight weeks.

The safety gear in the elevators is inspected very closely once every two weeks by two men called rope specialists, who spend their lives examining elevator ropes and can tell to a day, almost to an hour, how long a rope will last. Each elevator has a secret door. This door is entirely hidden by advertisements of new plays and department stores, and a passenger would never discover it without aid. It is for use in case of jamming. Should an elevator jam, the adjoining elevator is brought level with the stationary one, the advertisement frames are taken down and the door thus revealed is opened for the passengers to walk into the other elevator and complete their journey.

At some of the new stations, the elevators are operated by a remote control-button located in the booking office. In the intervals between shooting tickets and change out of the passimeter slots, the attendant in the booking office operates the elevators.

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Maintenance Methods *and* Devices

Flashing Lights for Cars in Single Track Operation*

By Farrell Tipton
Electrician San Diego Electric Railway, San Diego, Cal.

SAFETY on the San Diego Electric Railway, San Diego, Cal., has been enhanced by a flashing signal placed on its electric rolling stock. Many runs on the system are on single track and the signal warns motorists of an approaching car. The flasher is mounted on the upper left-hand side of the car so as to give the approaching motorist an idea of the clearance for passing.

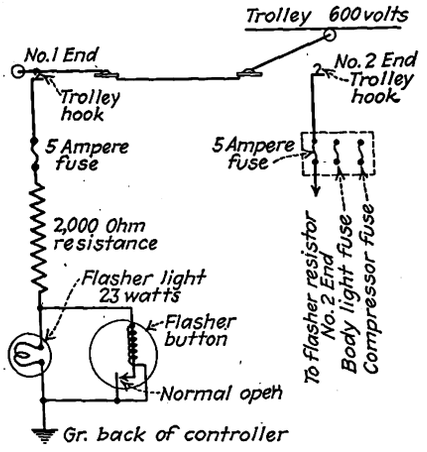
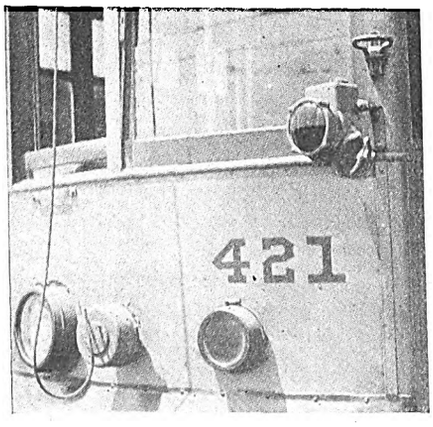


Diagram of connections for flashing light



Flashers are installed on the upper left-hand side of car dashers

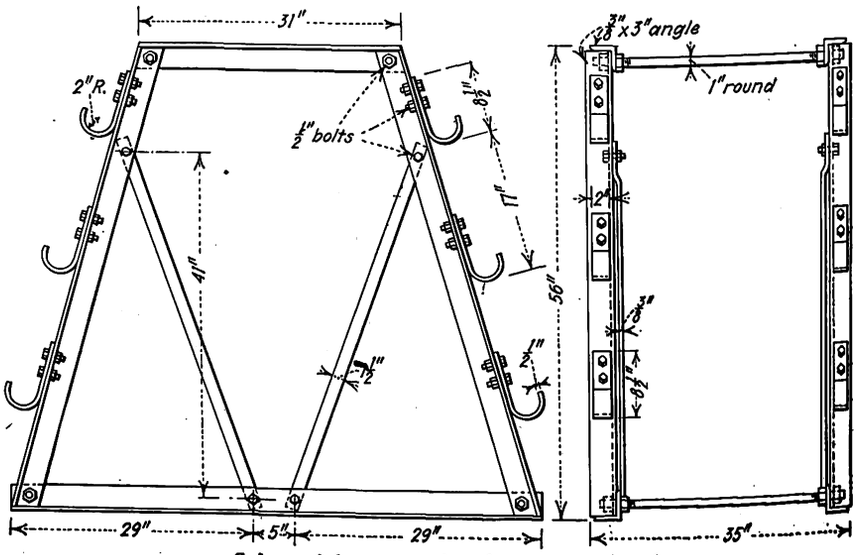
By wiring the flasher lamp and button in parallel, as shown in the accompanying diagram, it is possible to use a 110-volt, 60-watt flasher button in the 600-volt car circuit. This makes it possible for the flasher button to break the arc without difficulty. The button is held in a receptacle by a 6-amp. fuse plug located inside the car above the controller. The fuse plug acts as a protection for the flasher button and also as a means of holding it in place.

The signal housing has three lenses, two small ones at the bottom throw light to the ground; the center one is a yellowish red bullseye, 5 in. in diameter. This allows the various rays of the light to be seen when directly in line with the lamp. It is also visible for a considerable distance during the daytime.

*Submitted in Electric Railway Journal *Prize Contest.*

Steel Armature Rack

DAMAGE to repaired or rewound armatures is likely if they are not taken care of properly prior to installation in the motor frames. Often such injury is not detected until after installation or when a road failure has developed and interrupted service. In the shop of the Richmond Railways, Inc., Staten Island, N. Y., a steel rack in the armature room is used for the storage of the armatures until they are required for installation in the field frames. The general appearance and construction of the rack are shown in the accompanying sketch. The two side frames are made of $\frac{3}{8}$x3-in. angles held together by four 1-in. tie rods. A $\frac{3}{8}$x$1\frac{1}{2}$-in. diagonal brace installed from the base to each upright gives additional strength. The base occupies a floor space of 35x63 in., tapers upward to 35x31 in. and will accommodate six armatures. The hooks for supporting the armatures are made of 2x$\frac{1}{2}$-in. steel bolted to the uprights by two $\frac{1}{2}$-in. bolts. These hooks are made with a 2-in. radius and are spaced 17 in. apart. This rack is located near a chain hoist so that the armatures can be handled to and from the rack quickly.



Substantial construction for armature rack

Water Rheostat for Testing Line and Circuit Breakers*

By H. J. Beadle
Engineer of Equipment Dallas Railway & Terminal Company, Dallas, Tex.

LINE breaker and circuit breaker testing is facilitated by the recent addition of a 500-amp. water rheostat to the shops of the Dallas Railway & Terminal Company, Dallas, Tex. The water rheostat has been found the most convenient method of dissipating electrical energy necessary for this testing. The water box is made of 2-in. pine. It has a diameter of $3\frac{1}{2}$ ft. at the top, $2\frac{1}{2}$ ft. at the bottom, and is $4\frac{1}{2}$ ft. high. It is mounted on porcelain insulators. Suspended above the box by an insulator is a triangular iron plate $\frac{3}{16}$ in. thick, which serves as the positive electrode. It is arranged so that it can be lowered. A $\frac{1}{4}$-in. iron plate

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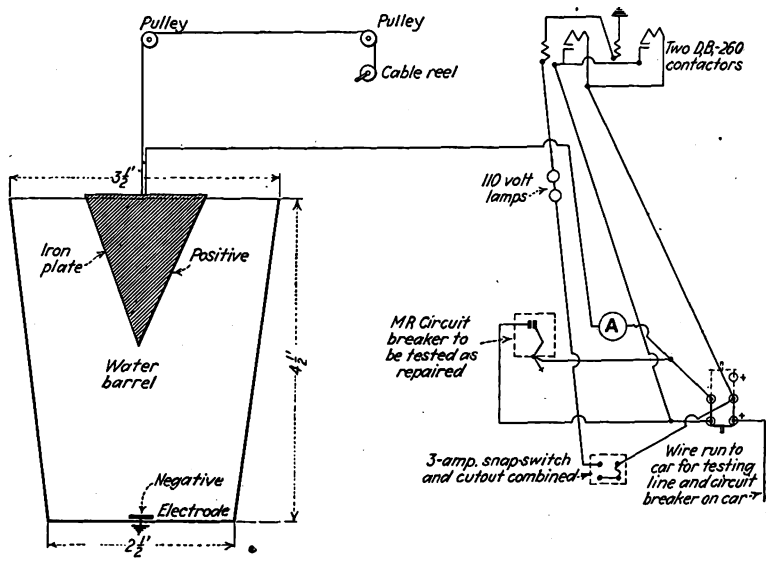


Water rheostat used by the Dallas Railway & Terminal Company to test line and circuit breakers

serves as the negative electrode and is connected to the return rail.

Two contactors make and break the current during the testing. A 3-amp. snap-switch connected in the control coil circuit is used for opening and closing the contactors. The two lamps shown in the diagram in series with the control coil act as a warning signal during tests. The iron plate was made triangular in order to facilitate current adjustments. An ammeter with scale 0 to 600 is placed in series with the line breaker for indicating values of current.

When a line breaker is being adjusted the wire for testing is run to the lower side of the series tripping coil, while the upper side is connected to the trolley wire. The breaker under test is then closed and the main contactors are closed by the control circuit. The positive plate is then lowered slowly into the barrel of salt water. When the breaker trips the current is recorded and another trial setting is made until the breaker is set at the proper predetermined value. If a circuit breaker is to be tested the main switch is thrown in the upward position and the resistance is varied by lowering or raising the plate in the liquid. In this manner we are able to set breakers quickly, and know definitely the approximate tripping points.

The water rheostat has also been found of assistance in the shop as a load for a railway motor run as a generator and coupled mechanically to another motor of like characteristics during tests.

Car Wheel Truck with Removable Platform

HEAVY pieces of apparatus often must be transported from one end of the shop to the other, and due to limited-aisle space it is impracticable to use a hand truck. Again, on account of the lack of storage space it is impossible to use a truck designed for use on the car rails. In the shop of the New York & Queens County Railway, Long Island City, N. Y., car wheels with a portable platform are used for the purpose. The platform is made of two 2x6-in. longitudinal oak beams to which 1x6-in. oak planking is spiked.

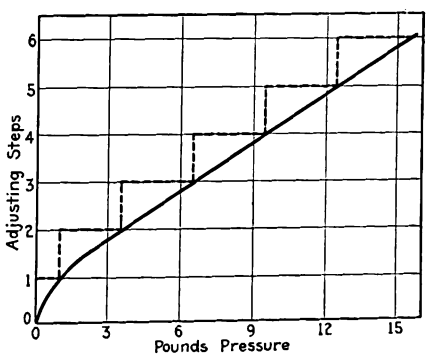
Grooves with the contour of the wheel axles are made about 10 in. from either end of these beams and extend across the entire width. They are spaced 6 ft. center to center.

This platform can be placed on any mounted pair of wheels and be used for transporting material. When it is not in use it can be stored against a wall out of the way and takes little floor space.

Spring Pressure on Railway Motor Brush-Holders

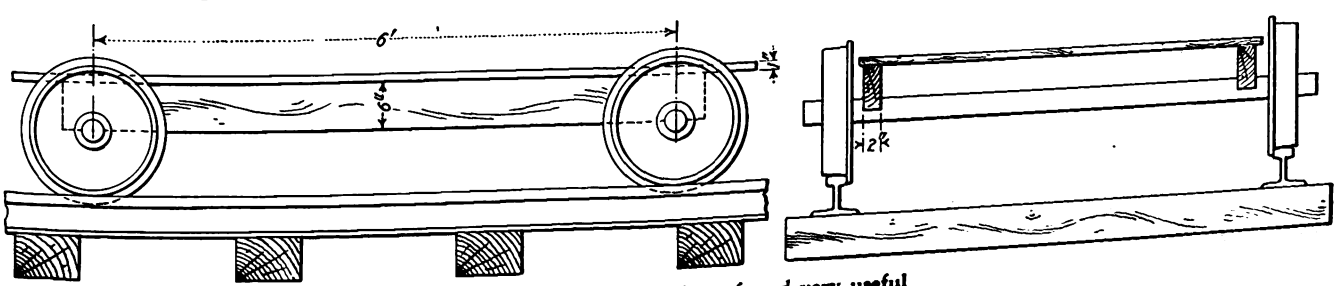
By John S. Dean
Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

PROPER spring tension for the pressure fingers on railway motor brush-holders is that which gives best results in the specific service which the motors are supposed to meet. The values adopted for new motors as furnished by one large manufacturer range on the average from 6 to 8 lb. per finger. This has been increased on some railway motors in service to 12 lb. in order to compensate for or to offset certain undesirable factors which affect the motor's operation. Some of these are poor track, rough and uneven commutators, and badly worn armature and



Adjustments of twin-washer type pressure finger. Each step represents a 3-lb. change in pressure

axle bearings, which result in unusual vibration of the carbons. Everybody seems to agree that the sensible thing would be to correct the fundamental causes, but in many instances this cannot be accomplished. Experience has shown that rough and uneven commutators are among the worst offenders. So it is recommended that



This car-wheel truck has been found very useful

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the surfaces of all commutators be kept trued up and given a smooth finish, and that the mica be undercut properly.

It is frequently assumed that this increased pressure will cause rapid wear on the surface of the commutator and the brush at the rubbing contact. In general this is not so, as the friction due to the increased spring pressure is offset by the better contact. The maximum wear of these parts is caused mainly by the arcing and burning due to poor surface contact. Thus by increasing the pressure within reasonable limits a better contact is obtained with minimum sparking, and often a reduction results in the wear on both the carbon and the face of the commutator.

The uniform adjustment obtained by the spring pressure finger mechanism, known as the twin washer type is shown in the attached curve. This mechanism is designed so that it can be used readily in many of the older types of brush-holders originally fitted with other designs of pressure fingers. Few parts are included and none of them move to wear the spindle or the adjusting tension barrel.

New Equipment Available

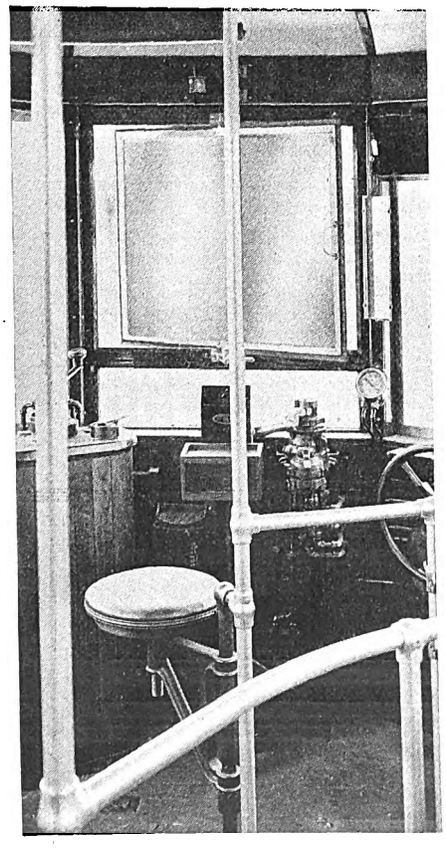
Reversible Window Easy to Keep Clean

CLEAR vision for motormen and bus drivers during sleet and snow storms can be obtained by use of a reversible window invented by M. Comerford, Ottawa, Canada. It is being manufactured by the Ottawa Car Manufacturing Company.

The window also gives effective ventilation during hot weather. It is built complete for use on cars or buses, being designed for use in the front end before the operator. The window may be pivoted either horizontally or vertically, as desired. In winter the window is made weatherproof by double strips of rubber all around the outside of the metal sash. This rubber is vulcanized at the corners and is free from holes and cuts. When the window is pressed into place a lock holds the rubber flange tightly against the window frame. The window can be locked in any position, thus permitting ventilation as desired during hot weather.

During sleet storms the reversing of the window once on each trip usually provides clear vision. As soon as one side on which sleet has formed is turned inward, the heat of the car melts it, and the window is wiped with a piece of cotton or cheesecloth.

Some of the advantages claimed for the Comerford reversible window are that it is airtight, that it gives clear vision under extreme climatic conditions, and permits perfect ventilation with no direct draft. Storm sash are unnecessary where this window is used, and it can be washed on both sides from either inside or outside the car.

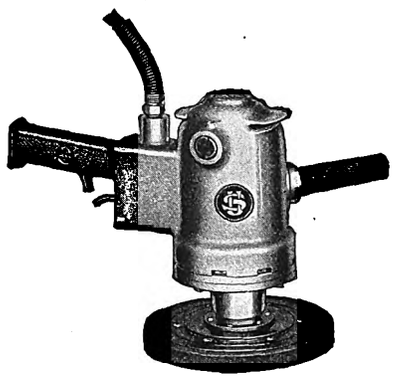


Reversible window fitted to the front end of an electric car

Sturdy Disk Sander

PARTICULAR attention has been given in the design of a sanding tool announced by the United States Electric Tool Company, Cincinnati, Ohio, to make it sturdy and powerful. A fan-cooled motor operates the 9-in. disk at a speed of 3,600 r.p.m. under load. A two-pole trigger switch in the handle is included.

The new disk sander handles easily, which increases production. Fine, medium and coarse sanding disks are furnished, together with 12 ft. of flexible rubber cable, two-piece attachment plug and armored cable guard. The weight is 12 lb.

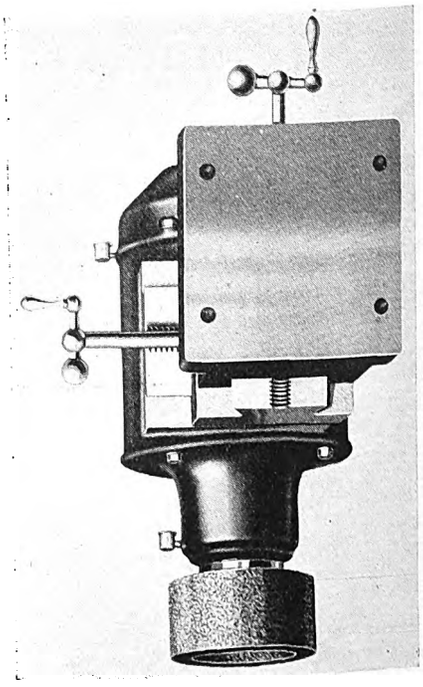


Disk sander designed for large production

Vertical Spindle Grinders

CONSTRUCTED primarily for thrust grinding with the spindle in horizontal position, or with the grinding wheel swung down at an angle are the three new types of grinders announced by the Hisey-Wolf Machine Company, Cincinnati, Ohio. The three types are made in 1-hp., 2-hp. and 5-hp. sizes for alternating current and in 3-hp. size for direct current. They are furnished with double slide adjustment, single horizontal slide adjustment, and with single vertical slide adjustment.

When used in connection with a boring mill, many internal and surface grinding jobs can be done with the same setting.



Vertical spindle grinder with double slide adjustment

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Association Activities

Safety Congress Held in New York

Favorable showing of electric railway industry is a feature of seventeenth annual meeting of National Safety Council

IN THE face of the appalling increase in accidents in general and of traffic accidents in particular the street railway companies of this country have within the past year registered a safety record that stands to their credit as an outstanding achievement. This has been done in the face of a heavy increase in the number of automobiles on the highways and in spite of increased traffic congestion in the metropolitan areas. Not only this, but many local transportation companies have materially raised the average speed of their cars. All of these facts were brought out in papers presented and in roundtable discussion at the meetings of the electric railway section of the National Safety Council, which held its seventeenth annual congress in New York City during the past week.

The sessions which brought together several thousands of delegates representative of a fair cross-section of American industry, constituted in fact a congress of safety. Subjects covered in the papers and brought up for discussion covered a wide range, swinging from safety in the home to the elimination of harmful noise, but centered largely upon the matter of traffic control and safety upon the streets. The sessions attracted widespread attention among men of the street railway industry and the meetings of the electric railway section were well supported, although the fact that the gathering took place so closely following the annual convention of the American Electric Railway Association at Cleveland undoubtedly had the effect of somewhat reducing the attendance. A feature of the railway sessions was the presence of 24 delegates representing the Pittsburgh Railways, headed by H. O. Allison, manager department of accident prevention, and including nineteen platform men chosen by their fellows from the various carhouses of the company. The men gave close attention to all that took place and on several occasions took animated part in the discussions.

Traffic Departments Urged

The meetings got under way at the Hotel Waldorf-Astoria on Monday afternoon, Oct. 1, with a general joint session of the electric railway, public utilities, steam railroad and taxicab and fleet owners' sections, at which President Homer E. Niesz of the National Safety Council presided. Dr. Miller McClintock, director Albert Erskine Bureau of Street Traffic Research, Harvard University, spoke on "Facts vs. Guesses in Solving the Traffic Problem," and made an earnest plea for the organization of traffic departments under trained engineers in all communities where the traffic problem is assuming serious proportions, to the end that an unbiased study based upon determinable facts could be made the groundwork of any approach to a solution of the difficulties presented. He cited the work of such departments in a number of the larger cities and the excellent results obtained. The discussion that followed developed the fact that serious consideration is being given in a number of communities to the separation of grades through the construction of double level streets, subways for rapid transit and the development of better facilities for speeding up surface traffic.

Ernest W. Corn, field representative National Safety Council, spoke on the subject "Getting the Community Interested in Safety," and took occasion to pay tribute to the public utility companies, particularly the street railways, as being the staunchest supporters of local safety councils and the ones most apt to come forward with helpful and constructive suggestions. He outlined, briefly, the methods to be followed in organizing councils in small cities. Robert I. Catlin, secretary Aetna Life Insurance Company, explained the interest of the great casualty insurance companies in the safety movement. Outlining the principles upon which automobile rate-making is determined he showed how any community with a dependable volume of accident experience makes its own rate. He pointed out that not to exceed 25 per cent of autos are covered by casualty insurance, the delinquency being most pronounced in the smaller towns and rural districts. He recommended an intensive study into the causes of accidents, and held that this should come before a detailed study of compensation. In the discussion of the Massachusetts compulsory insurance law, which seemed to be very much in the minds of some of the delegates, the fact was developed that there has been a marked downward trend in the number of fatalities and injuries to pedestrians since the law became effective. The contribution of the electric light and power industry to the safety movement was set forth in a paper prepared by John W. Lieb, senior vice-president New York Edison Company.

Separate Sessions Held

Separate sessions of the electric railway section were held on Tuesday, Wednesday and Thursday mornings. A. W. Koehler, superintendent of accident prevention the Milwaukee Electric Railway & Light Company, presided as chairman at the Tuesday morning meeting and gave a résumé of the activities and accomplishments of the section during the past year. He urged particularly the necessity of a deeper study of the causes of accidents and their possible prevention, and made a plea for continued support by the railway companies of the work of the National Council. Daniel Fennell, general superintendent of transportation Kansas City Public Service Company, Kansas City, Mo., presented a paper on "Overcoming Transportation Hazards," in which he reviewed the methods and accomplishments along that line on the property which he represents. The company had made a considerable outlay for mechanical improvements tending to reduce accidents, coincident with changing its service over to 100 per cent one-man operation. An analytical study of accidents was being made and the trainmen were carefully trained and coached in accident prevention methods. He paid tribute to the work of the local safety council, which had co-operated extensively. Mr. Fennell's paper will be abstracted later in the JOURNAL. Questioned as to the disposition of the surplus men made available by the change to one-man operation Mr. Fennell explained that in anticipation of

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Oct. 8-12*—American Welding Society, fall meeting, Philadelphia, Pa.**

***Oct. 17-19*—Society Automotive Engineers, national transportation meeting, Newark, N. J.**

***Oct. 24-25*—Public Utilities Association of West Virginia, annual meeting, Huntington, W. Va.**

***Nov. 7-8*—Iowa Electric Railway Association, operating meeting, Roosevelt Hotel, Cedar Rapids, Iowa.**

***Nov. 13-16*—National Association of Railroad and Utilities Commissioners, New Orleans, La.**

***Nov. 21-22*—Public Utilities Association of Virginia, Hotel Roanoke, Roanoke, Va.**

***Jan. 14-18, 1929*—American Road Builders' Association, convention and road show, Cleveland, Ohio.**

***Jan. 23-25, 1929*—Electric Railway Association of Equipment Men, Southern Properties, Houston, Tex.**

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possible complications the company had refrained from hiring any new men for a number of months prior to the change. Coincident with the change, service had been increased 25 per cent, thus taking care of some of the surplus. A few men had been retired, others had been assigned to lighter jobs.

John J. Reynolds, claims attorney Boston Elevated Railway, read a paper on "Promotion of Accident Prevention Through Inter-Departmental Co-operation." The speaker reviewed various phases of safety organization, humanitarian work and educational activities, with particular reference to the company which he represented.

D. A. Scanlon, general superintendent of railways Northern Ohio Power & Light Company, Akron, Ohio, presented a review of one-man car operation from a safety standpoint, in which he pointed out not only the excellent results which had followed the introduction of one-man cars on his property, but also a compilation of similar results obtained in other cities. The papers of Messrs. Reynolds and Scanlon will be presented in abstract in a later issue.

Speed with Safety Discussed

Lucius S. Storrs, managing director American Electric Railway Association, addressed the session on Wednesday morning on the subject "Reconciling Speed with Safety," in which he quoted from the experiences of a number of representative urban and interurban properties, showing that in practically every case where a determined effort had been made, the number and seriousness of accidents had been decreased simultaneously with increases in average schedule speeds. At the conclusion of his paper he made a special appeal for a more general interest and participation in the annual contests for the Brady Safety Award. Mr. Lynch, director Kansas City Safety Council, emphasized the need for improved braking equipment on street cars, holding that otherwise attempts to increase speed would increase accidents. This started a general discussion in which a number of those present voiced their opinions. Interest was added by the participation of a number of Pittsburgh motormen, who spoke from the standpoint of the platform man, and took the position that the provision and proper inspection of mechanical apparatus must come first in any program directed at the attainment of higher speed. Charles Gordon, editor Electric Railway Journal, took the floor for the purpose of getting into the record the point that the attainment of greater speed in city operation depended almost entirely upon quicker acceleration and deceleration, shorter layovers, freedom from traffic interference and less delay in loading and unloading passengers. He emphasized the fact that discussion of increased speed by electric railways does not involve higher maximum speeds, and that greater alertness on the part of operators, and equipment of which particulars the human element, as represented by the platform men, that permits faster acceleration and braking rates—the only available means of decreasing running time in frequent stop city service—both tend toward the reduction rather than the increase of accidents. H. O. Allison, manager accident prevention bureau Pittsburgh Railways, read from the recent report of the committee on service betterment in support of Mr. Gordon's position.

T. G. Brabston, superintendent transportation Birmingham Electric Company, Birmingham, Ala., taking up Mr. Lynch's objection, gave specific instances where speed had been increased with safety. So far as his company was concerned speed had been quite materially increased, and chargeable vehicular accidents were being reduced month by month. Summing up the discussion, Mr. Storrs took the position that the operating company must, as the preliminary to any safety program, provide safe and suitable rolling stock, that intensive training of the platform men should follow, and that the program should be rounded out with an effort to educate the public into a proper appreciation of the company's problems. A paper on "The Shop Employee's Contribution to a Safe Railway," was presented by Harry Cordell, master mechanic Chicago, North Shore & Milwaukee Railroad. Mr. Cordell dug into the psychology of the man in the shop. His views will be published in an early issue.

Safety Playlet Presented

At the Thursday morning session, Arthur T. Warner, general manager of traffic Public Service Co-ordinated Transport, Newark, N. J., spoke on "Bus Operation from a Railway Man's Viewpoint," in which he reviewed the experience of his company in expanding its use of buses until it is now the largest bus operating concern in the country. The program was concluded by the presentation of a safety playlet, "Whose Fault?", by a company made up of platform men of the Public Service Co-ordinated Transport. Based on an every-day incident in the life of a street car man, the playlet had a special appeal to those present, and was enthusiastically received.

The following officers were elected to carry on the work of the electric railway section during the coming year:

Chairman, E. K. Eastham, St. Louis Public Service Company, St. Louis, Mo.; vice-chairman, H. K. Bennett, manager Providence Safety Council, Providence, R. I.; vice-chairman, Melvin W. Bridges, Chicago Rapid Transit Company, Chicago, Ill.; vice-chairman, Glenn H. Shaw, Northern Ohio Power & Light Company, Akron, Ohio; secretary, Paul Hodson, East St. Louis & Suburban Railway, East St. Louis, Ill.

The following chairmen of committees were selected:

Membership, chairman, Samuel H. Reid, Bureau of Safety, Chicago; vice-chairman, Arthur Gaboury, Quebec, Canada.

Publicity and News Letter Editor, Buell W. Nutt, The Safety Equipment Service Company, Cleveland, Ohio.

Poster and Slide, L. R. Brown, New York State Railways, Rochester, N. Y.

Program, T. G. Brabston, Birmingham, Ala.

Engineering and Statistics, Edward Maltz, Cleveland Railway, Cleveland, Ohio.

Members-at-Large, R. W. Emerson, G. T. Hellmuth, Daniel Fennell.

An interesting program of special events had been prepared for the entertainment of the delegates, including safety motion pictures, plant visits, luncheons and dancing. Of special interest to visiting railway men was an inspection trip through the subways of the Interborough Rapid Transit Company on Friday afternoon, during which the guests were shown the functioning of the intricate signaling and safety devices of the system.

Central Master Mechanics Meet at Cleveland

MEMBERS of the Central Electric Railway Master Mechanics' Association held a meeting at Cleveland, Ohio, on Sept. 25, which was featured by the presentation of a paper by A. D. McWhorter, general superintendent Memphis Street Railway, outlining the details of organization of the Electric Railway Association of Equipment Men, Southern Properties, and the work it is undertaking. Inasmuch as this southern group of railway mechanical men parallels in general interest and activities much of the program of the master mechanics in the C.E.R.A. territory, the information supplied by Mr. McWhorter was listened to with considerable attention.

Twelve questions covering practically all phases of electric railway maintenance were used as the basis for a discussion. The subject of lacquer spray painting occupied the major portion of this part of the meeting. There was a wide divergence of opinion among the delegates.

Automotive Engineers to Meet

MOTOR truck and motor coach operation is to be the subject of addresses and general discussion at a three-day national transportation meeting to be held by the Society of Automotive Engineers at the Robert Treat Hotel, Newark, N. J., on Oct. 17, 18 and 19, 1928.

At the first session short haul and long haul of passengers will be the subject of addresses by speakers whose names have not yet been announced. Another session is to be devoted to the store-door delivery of freight by motor truck. The business aspects of fleet operation will be dealt with at one of the meetings and a number of reports are to be presented covering various phases of operation, maintenance and service. It is expected that the speaker at an evening banquet will be Dr. Miller McClintock, expert on highway traffic. At the close of the last day's session an inspection trip will be made through the Holland Vehicular Tunnel.

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News of the Industry

Program of Economy Urged for Seattle Municipal Road

George B. Avery, superintendent of public utilities at Seattle, Wash., may be asked to take direct charge of the municipal street railway and appoint his department heads to manage the system. A decision to this effect, it is pointed out, would dispose of the question of naming a successor to D. W. Henderson, general manager of the system, who has been ill since last May.

Possible action to this end was intimated by Chairman E. L. Blaine, of the budget committee, during a discussion of Mr. Henderson's condition and the problem of fixing his salary for the coming year. Mr. Blaine said:

> It is my understanding that it is the ultimate intention of the Council that the railway system be placed under the direct charge of the superintendent of city utilities, and that he appoint his department heads as has been done in the past by Mr. Henderson.

Although the utilities department which Mr. Avery heads is related to all city utilities, the railway system has been operated almost independently under Mr. Henderson's leadership.

Superintendent of Utilities Avery believes a saving of 10 per cent can be made in the operating expenses of the municipal railway, but that it would take two or three years to effect the full saving of $500,000 a year and the result could be accomplished only if those who sought to make it were really given a free hand.

Higher Speed from Evanston to Chicago Loop

Work on track elevation through the city of Evanston in the interest of the Chicago Rapid Transit Company, operating the elevated lines, is progressing rapidly. The track elevation work extends from Church Street north to the city limits of Evanston at Isabella Street. The trestle work for the temporary northbound track is practically completed and it is expected that trains will be running over it about Oct. 10. Engineers estimate that the southbound track will be "up in the air" by the middle of November, so that work on the permanent tracks can be commenced at that time and carried on to a finish without any interference with traffic.

The track elevation is being financed by the Chicago, Milwaukee, St. Paul & Pacific Railroad, which owns the right-of-way, but the tracks will be used exclusively by the trains of the Chicago Rapid Transit Company and the North Shore Line. This track elevation work will add to the fixed charges of the Chicago Rapid Transit Company, but the service to Evanston and Wilmette will be improved. The cost of maintaining and operating gates at street crossings will be eliminated and the running time of trains from Wilmette to the loop in Chicago be reduced.

Under the present plan of surface operation north of Church Street in Evanston safety stops have to be made at a number of the busier street crossings. The track elevation will eliminate the necessity for such stops, so the customers of the elevated lines will benefit by the faster running time. The completed tracks will be laid on a solid-fill roadbed with concrete retaining walls and steel and reinforced concrete bridges over streets similar to the completed roadbed from Wilson Avenue north.

Ambulance Chasers Castigated

Seventy-four New York lawyers named in Justice Wasservogel's report on recent investigation submitted to Appellate Division

POSITIVE evidence exists of the need of reform in New York court procedure to suppress evils connected with "ambulance chasing," according to a report submitted to the Appellate Division of the Supreme Court on Oct. 2 by Supreme Court Justice Isidor Wasservogel. The report is based on extended hearings conducted before this justice during the past six months, at the request of the Appellate Division. Further particulars of the investigation are given in a paper on page 638 read before the American Electric Railway Claims Association by Frank E. Carstarphen. It was prepared, however, before Judge Wasservogel's report was made public so contains nothing about the contents of the report itself.

The report declares that most of the actions for personal injury damages had gotten into the hands of a few attorneys. Several lawyers had testified that they had had as many as 750 to 1,000 such cases a year, and there were a number of attorneys who averaged more than 500 cases a year. This business had been built up by elaborate systems for obtaining information about accidents from a number of sources. One was from the police department, much of the information in the hands of the police having been sold by "slip boys" employed to assist news reporters at Police Headquarters.

"Many police officers doing traffic duty are in the pay of the 'ambulance chasers.' These traffic policemen carry the cards of ambulance chasing lawyers in their hats," says the report. Other sources of information were hospitals. Of solicited negligence cases 90 per cent were settled out of court. The report also says that the conduct of some of the corporate defendants has been equally reprehensible, their representatives racing with the ambulance chaser to the bedside of the injured person to obtain a release from him while he is overwrought and in pressing need of money.

The report names 74 attorneys to the Appellate Court for discipline. More "flagrant" cases have been referred to the District Attorney, the report disclosed.

Chief among the recommendations of Justice Wasservogel was one cutting the maximum percentage attorneys can fix as contingent retainers, from 50 per cent to 33⅓ per cent. Another was that all oral contracts of retainers are void as are also those written contracts obtained at the hospital or within 15 days of the accident, unless made with the approval of the court. Another was to make soliciting of such cases criminal contempt. Another, urged by many prominent lawyers with whom the Justice concurred, was to make perjury a misdemeanor instead of a crime. The purpose of this change was to provide for its more certain punishment.

The report contains the very satisfactory statement from the Justice that as a result of the investigation, ambulance chasing in New York is now "dead."

Electric Service to Wilmington from Philadelphia

COINCIDENT with the change to fall and winter schedules by the Pennsylvania Railroad on Oct. 1 the starting of full electric service took place, affecting local and commuting trains between Philadelphia, Chester, Wilmington and intermediate points.

Under the terminal improvement plan, which centers on the erection of a new main passenger station in Philadelphia on the west bank of the Schuylkill River, local and commuting trains will pass over a new river bridge and through a subway, now under construction, to an underground suburban station to be located at Fifteenth Street, north of the present Broad Street Station.

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Reconstruction Obligations in Buffalo

Proceedings instituted by the city of Buffalo, N. Y., to force the International Railway to undertake track reconstruction and repaving in certain streets through which the company operates is in violation of an agreement entered into earlier in the year with the municipal authorities under the terms of which the railway appropriated a specified sum for reconstruction work in 1928. This program now is nearing completion. Bernard J. Yungbluth, president of the company in a letter to the Buffalo City Council, says that during the years of controversy and litigation between the city and the company little track and paving reconstruction was done because the revenues of the company at the rates of fare then in effect were not enough to warrant large expenditures. It was during this period, he says, that company stockholders contributed $4,140,445 to carry passengers at less than cost.

In his letter President Yungbluth said that the company stated its desire that the city and company would co-operate for the benefit of public service. When the present rate of fare became effective, it was never asked or expected that the company should spend all the additional revenue from increased fare for reconstruction of tracks and paving, yet the company has devoted it all and more to that purpose. He alluded to an editorial article in The *Financial World* of New York on the Buffalo transit situation which viewed the attitude of President Yungbluth as a move to protect car riders against a higher rate of fare.

No further move by the company was made until repaving work was started between the tracks of the railway on the East Seneca Street line by city contractors. Then the company president issued a statement saying application would be made at once for a 10-cent fare on the city lines so that increased revenue will be made available to finance the paving work. The Buffalo city fare is now three tokens for 25 cents with a 10-cent cash fare. The work undertaken by contractors will be paid for by the city of Buffalo and assessed against the railway. In his statement to the public, President Yungbluth says:

When the Public Service Commission in June, 1927, ordered present fares, it advised the city and the railway to co-operate in making a program of street paving and reconstruction. That advice has been followed. The company agreed to spend $250,000 in 1927 and $375,000 in 1928 for the reconstruction of tracks and paving in streets selected jointly by the city and company. The company did spend the sums mentioned. The company was not expected to spend in track and paving reconstruction all the additional money obtained from the new rate of fare, but it has spent all the money and more for this purpose. The additional demands now being made by the city are unreasonable and unfair to the company and car riders.

In view of the additional demands for more track reconstruction and paving, the company has only one course open, the immediate prosecution of its case to secure rates of fare that will enable it to pay these track and paving charges and other costs of service and that will assure to the stockholders the fair return to which they are entitled but for which they have been waiting since 1918.

Notice has been served by the International Railway, Buffalo, upon municipal authorities of Buffalo, Niagara Falls and Lancaster that it intends to apply to Federal Judge John R. Hazel in the United States district court at Buffalo on Oct. 15 for permission to increase local fares in these cities. The company contends the present rates are confiscatory. No application will be made to the New York State Public Service Commission.

In Buffalo, the railway asks a 10-cent fare instead of three tokens for 25 cents. In Niagara Falls the company will ask an increase from 5 cents to two tokens for 15 cents and the same rate of fare will be asked in Lancaster. The International also will ask for a 5-cent fare for children between the ages of five and twelve years in the three cities in place of the 3-cent half fare now in effect.

The city of Buffalo already has engaged Milo R. Maltbie and W. C. Hine, New York, public utility experts, to oppose the proposed fare increase. The city says it will attack the jurisdiction of the federal court on the ground that application was not preceded by an appeal to the Public Service Commission.

Removing Chicago's "L" Pillars

The third and final step in the work of removing columns of the Chicago Rapid Transit Company's elevated structure in the so-called Loop district at street intersections in accordance with the provisions of the city contract ordinance of 1925 is nearing completion. The work of this year has been carried on in Lake Street, supporting columns having been moved from the street to the curb line at Dearborn, Clark, LaSalle and Wells Streets. The caissons for the new columns were put down to hard pan at a depth of about 70 ft. on the average. The cost of the work for this year is approximately $186,000. It will be completed about Dec. 1.

Other structural changes are being planned at LaSalle and North Water Streets, made necessary by the widening of LaSalle. The present span across LaSalle for the tracks running into the North Water Street stub terminal is 46 ft. The new span will be 90 ft.

In the Interest of Baltimore School Children

The United Railways & Electric Company, Baltimore, Md., has opened branches in six of its carhouses in various sections of the city at which school children may obtain identification cards which will enable them to purchase 5-cent fare tickets for use going to and from school. This relieves the children from going to the center of the city to get the cards. The branches are open daily from 2 to 7 p.m.

Philadelphia Fare Suit Dismissed

The case against the increased fare on the lines of the Philadelphia Transit Company was dismissed on Oct. 1 by the Supreme Court upon motion of the taxpayers who brought the suit. Daniel J. Furey and other taxpayers entered the Federal District Court in May, 1926, to enjoin the increase, contending that the 5-cent rate was fixed in 1907 by contract between the city and the company and could not be increased by the state commission until 1957. The district court dismissed the suit for want of jurisdiction, taking the view that it was without power to interpret the state laws.

D. W. Henderson Improved

D. W. Henderson, veteran superintendent of the Seattle Municipal Street Railway, Seattle, Wash., has been removed from the Meadows Sanitarium to Providence Hospital, where he underwent a successful blood transfusion operation. Numbers of his old employees on the railway offered themselves for the operation when it became known that blood transfusion would be necessary. No secret has been made of the fact that Mr. Henderson has been very low. He is believed now to have passed the point of greatest danger, but his recovery will probably be a matter of months.

Map to Guide the Car Rider in Chicago

To assist those who want to use a street car in going from one part of the central district to another the Chicago Surface Lines has issued a new map of this district. Car lines passing through the district are indicated by the numbers, and by reference to the map, it is possible to know just what car to take to reach any given location. The map will be distributed through department stores, banks, hotels and at railway station information desks.

Known in Des Moines By Their Weekly Pass

Blank lines are printed on the back of the weekly pass in Des Moines, Ia., so that pass holders can write in their names and addresses and telephone numbers. The plan was adopted after several patrons had written officials of the Des Moines City Railway suggesting that this would help to recover lost passes.

Would Equalize Stockton Fares

The Central California Traction Company has applied to the California Railroad Commission for permission to increase the fare on its Sunnyside line in the city of Stockton from 6 cents to 7 cents, or four tokens for 25 cents. This change will place the fare on that line on a parity with other fares in Stockton.

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Investigation of Proposed Rate in Illinois

Proposed advanced rates sought by the Illinois Power & Light Corporation for Urbana and Champaign, Decatur, Galesburg and East Galesburg, Quincy, Danville, Bloomington and Normal, Jacksonville and South Jacksonville have been suspended by the Illinois Commerce Commission until Nov. 24 in order that investigation may be made. In the case of all of the seven lines the company is asking a 10-cent cash fare with three tickets for 25 cents, with rates for children at 4 and 5 cents.

This then leaves only eight other lines in the state operating at their old rates without requests for advances as increased rates were granted by the commission to the Illinois Power Company on its line in Springfield in August and to the Illinois Power & Light Corporation on its line at Cairo in June.

Unable to Do Improvement Work in Hammond

In opposition to a petition filed by the city officials of Hammond, Ind., which sought the revocation of the franchise of the Hammond, Whiting & East Chicago Railway for failure to improve its right-of-way, Charles Lawrence, general superintendent of the railway, testified that his company could not comply with the city's demands because it was losing $11,000 a month and was now almost hopelessly in debt. Both the mayor and the city attorney of Hammond charged that the railway had promised to raise its tracks to grade level on the newly paved Hohman Street, an important traffic artery. Although the improvements were completed several months ago, it had been deemed unsafe to open the thoroughfare to traffic because of the hazard created by the unprotected car tracks.

Mr. Lawrence said that he had made the promise to the city of Hammond to improve the right-of-way at a cost of $10,000 on the condition that his company could raise the money. His company had $1,000,000 of first mortgage bonds on which interest was in default.

Shore Line Motor Coach Company buses, which operate over the same streets on which the railway's right-of-way is located, are said to have hurt the railway financially.

Point Won by Seattle Man in Puget Sound Suit

A victory was won by J. G. Von Herberg in his court fight against the Puget Sound Power & Light Company, Seattle, Wash., when the United States Circuit Court of Appeals recently dismissed the company's suit against him. The suit attempted to enjoin the Seattle man from making demands that trainmen's wages be given priority over payments of principal and interest on municipal railway bonds, and Von Herberg is now free to press his claims that trainmen's wages should receive priority over payments on the debt. The action was made part of the traction company's suit to force the city of Seattle to recognize the bonds as a first lien upon revenues of the line. The whole case was reviewed by the circuit court in Seattle on an appeal by the traction company from an adverse decision in district court. The suit against the city was taken under advisement while the action against Von Herberg was dismissed to open court, after a presentation of his cause by his attorney, R. P. Oldham.

Enforcement of Parking Restriction Necessary

MAYOR MACKEY is about to ask the City Council to pass the parking ordinance of last summer which was then laid aside because of the severity of its restrictions. The extent to which the public already utilizes the parking areas, established by the Philadelphia Rapid Transit Company and others, outside the central business district indicates that present congestion is to some extent bringing about its own remedy. Drivers are finding it doesn't pay to bring their cars into the center of the city during the rush hours. It is too much to hope, however, that any lasting remedy will come through voluntary action. —Philadelphia *Public Ledger*.

Hearing on Indiana Merger

Approximately 500 notices, announcing Oct. 9 as the date for a preliminary hearing on a proposed $70,000,000 merger of electric power and traction interests into the Indiana Electric Corporation, have been sent out by Harvey Harmon, a member of the Indiana Public Service Commission, in the first step toward bringing the merger proposal under scrutiny of commission members and the public. Notices were sent following an analysis and explanation by Mr. Harmon to the entire commission of the work he thus far has done toward gathering data and otherwise preparing for hearing evidence upon which the commission will base its action. The entire membership of the commission approved the plan and ruled that the hearing should be held before it.

The petition was filed with the commission by Halsey, Stuart & Company, of Chicago, consolidation managers, and involves a merging of the electric power interests in central Indiana owned by Samuel Insull of Chicago, with those of the Terre Haute, Indianapolis & Eastern Traction Company and power interests. The meeting will be held in the chamber of the House of Representatives at the State House. In view of the fact that a hundred or more attorneys may be engaged in the case, the commission has asked that spokesmen be named whereby a few can present the respective sides.

Five-Cent Fare Continued in Lorain

Residents of Lorain, Ohio, will continue to pay a 5-cent fare until Nov. 1, when the State Public Utilities Commission will take up again the plea of the Lorain Street Railroad. The bare possibility exists, however, that the hearing may be resumed at an earlier date if City Solicitor Wesley L. Grills completes the city's side of the case before that date. Mr. Grills said he would ask the Council to employ a special engineer to make an inventory of the railroad's property before the hearing would be resumed. The railroad is seeking a 10-cent cash fare, with seven tickets for 35 cents.

Five-Cent Fare to Decatur Must Be Retained

An order permanently enjoining the Georgia Power Company from discontinuing railway service to Decatur has just been signed by Judge John B. Hutcheson, in the DeKalb Superior Court. This comes as a result of an attempt on the part of the company to discontinue service on the North Decatur line, where a 5-cent fare is in force.

Two years ago the company served notice on the city of Decatur that the service on this line would be discontinued and the tracks taken up. The company claimed that it was losing money on the line under a 5-cent fare and that it was unfair to allow patrons to ride from Decatur to Atlanta for 5 cents while patrons riding from Atlanta into town on the same line, a shorter distance, paid 7 cents. Decatur secured a temporary injunction compelling the company to continue its service.

Judge John B. Hutcheson holds that the company must abide by its contract to charge not more than 5 cents between the two cities.

Omaha to Vote on Bond Issue for No-Toll Bridge

The County Board at Omaha, Neb., has voted to submit at the coming election an $800,000 bond issue as its contribution to the construction of a no-toll bridge across the Missouri River at that point. Pottawatomie County, Iowa, in which Council Bluffs is located, has not yet acted on a petition to submit a $400,000 bond issue as its share of the cost. The only bridge connecting the two cities is owned by the local railway through a subsidiary, the Omaha & Council Bluffs Railway & Bridge Company, Council Bluffs, Iowa, which operates it on a toll charge basis. The officers of the company assert that if a competing bridge or a no-toll bridge is erected, the loss of revenue may be so great as to force the railway into a receivership. Attorneys say that there is no law which permits a county to vote bonds in aid of a bridge, but that it may construct one itself by the proceeds of bond issues.

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Fares Increased by Eastern Massachusetts

The public trustees of the Eastern Massachusetts Street Railway, Boston, Mass., announce a general increase in fares in all divisions of the system to take effect on Oct. 1. This increase in fares is due to the award of the board of arbitration increasing wages of employees retroactive to May 2, 1928. This increase in wages will mean an increased expense of approximately $126,000 annually.

There will be no change in the rate of cash fare, the present rate being 10 cents in all divisions. In general the ticket fares will be changed by reducing the number of rides on the ticket.

The new rates of fare effective in the various divisions are as follows:

Chelsea—Six rides for 50 cents.
Melrose-Woburn—Twelve rides for $1.
Lynn—Sixteen rides for $1.
Salem—Fourteen rides for $1.
Lowell—Thirteen rides for $1.
Lawrence—Fourteen rides for $1.
Norwood—Fifteen rides for $1.
Quincy—Thirteen rides for $1.
Brockton—Thirteen rides for $1.
Taunton—Twelve rides for $1.
Fall River—Eight rides for 50 cents.

In Haverhill and Weymouth the eleven rides for $1 punch card ticket will be abolished and a 10-cent cash fare substituted, and in Hingham the ten rides for 60-cent punch card ticket will be abolished and a 10-cent cash fare substituted.

A Tramway Up Mount Hood

Refusal of Col. W. B. Greeley, former United States Forester, to allow the construction of a tramway to the summit of Mount Hood has been overridden by a committee of Oregan citizens appointed by Secretary of Agriculture Jardine to consider an appeal of the promoters of the line.

The committee, after a three-day trip on the mountain, voted to recommend that a permit be issued for construction of the line. It will submit its report to Mr. Jardine when he returns from Alaska.

If Mr. Jardine issues the permit, and he indicated that he would be bound by the report of the committee, a tramway will be built from Cloud Cap Inn, at the 6000-ft elevation, to Cooper's Spur, a distance of 2 miles and an elevation of 8,500 ft. From there a cableway, equipped with cages of 40-passenger capacity, will be constructed to the summit of the mountain, 11,220 ft. above sea level.

3,000 Volts for Lackawanna Suburban Lines

Direct current of 3,000 volts will be used by the Delaware, Lackawanna & Western Railroad for propelling suburban trains on 173 miles of track to be electrified in the northern New Jersey zone, plans for which are now being made. This high voltage system was decided upon because it seems the best suited to meet the operating requirements applying in both suburban and main line service, in the event that later it is considered desirable to carry the electrification of the road over the Pocono Mountains to Scranton and the anthracite coal fields.

Emblems Will Mark North Shore Boosters

Lapel buttons and pins of bronze, silver and gold made in the form of miniature North Shore Line emblems will be given to the men and women business boosters as special and distinctive awards. In addition five diamond-set buttons or pins will be given to the first five members of the North Shore Line family who earn the required number of credits. To win a bronze emblem a "Better Business Account" must show ten credits; a silver award requires 50 credits; a gold button 300 credits and a diamond award 2,000 credits. All credits are cumulative. According to *The Highball,* the official publication of the company, the emblem will identify the wearer "as a member of the North Shore Line family who has done his bit towards selling the 'Road of Service' to the public."

Ten-Token Purchasers Receive Containers in St. Louis

The St. Louis Public Service Company and its subsidiary, the St. Louis Bus Company, are giving metal taken containers to each patron purchasing ten tokens for 80 cents. This move is intended to speed up traffic by reducing the number of one, two and three-token purchases. The initial supply of 50,000 containers was exhausted within three days after the company offered them to its patrons. A noticeable improvement in handling passengers has taken place since the containers were distributed.

"Two Bells" Now a Monthly

In accordance with an announcement made several weeks ago, the September issue of *Two Bells,* the official publication of the Los Angeles Railway, Los Angeles, Cal., has come out in new dress as a monthly under the editorship of W. T. Shelford with Janet Converse acting as publicity manager. In an explanatory paragraph the paper says that if it has been at all interesting as a weekly it is going to try to make itself more interesting as a monthly.

Another Proof of Progress in Street Railway Advertising

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Wage Bonus Discontinued in Salt Lake City

Trainmen and shopmen of the Utah Light & Traction Company, Salt Lake City, Utah, have been notified of the discontinuance of 2 cents an hour bonus, which has been in effect most of the time since May, 1923. The operators are on a base scale of 57 cents an hour, with an increase or decrease clause contingent on the cost of living throughout the United States. The 2-cent bonus has been continued to the 57-cent basis in view of the fact that living costs have been at 172 points or more, according to statistics issued by the United States Department of Labor.

During the last six months, however, the cost of living has dropped from 177.4 to 170. The base pay of 57 cents an hour remains in effect as long as there is not more than three points variation above 169 points and below 159 points. The cut of 2 cents merely puts the workers on the agreed basis.

More Inclusive Pension Plan in Omaha

A change in the pension plan of the Omaha & Council Bluffs Street Railway, Omaha, Neb., has been approved by the board of directors. Accordingly, the pension plan has been amended to include any of the employees of the company who have served for twenty years or more, and who have become incapacitated by sickness for any further useful work.

The clause now included applies whether or not the employee has reached the pension age requirement of 65 years. He must, however, have served for twenty years and have become disqualified for any further work with the company. J. W. Salyards, about 60 years of age, has already benefited by the new provision. In his case the pension was made retroactive to June 1. He was thus enabled to share in the plan to receive a pension, although he was nearly five years younger than the previous minimum age limit.

New York Fare Case Over to Oct. 15

Argument of the appeal of the city of New York and the Transit Commission from the Interborough Rapid Transit Company 7-cent fare decision of a federal statutory court, scheduled to be heard by the United States Supreme Court on Oct. 1 has been postponed until Oct. 15.

The adjournment was granted on motion of Irwin Untermyer, acting for Samuel Untermyer, special counsel for the Transit Commission, whose illness was given as the reason for delay. Former Judge William L. Ransom, special counsel for the Interborough, joined in the motion and Charles L. Craig, special counsel for the city, informed the court that although the municipality was ready to proceed it had no objection to the two week's delay.

Chief Justice Taft requested counsel in the case to submit written statements of the total time desired for argument as well as the time to be allowed each attorney who participates. Pending argument on Oct. 15 the 7-cent fare stay granted by the court last May remains effective.

Interurban Would Use Cincinnati Subway

The Cincinnati, Hamilton & Dayton Electric Railway is said to be considering the use of the Cincinnati subway to bring its cars to the heart of the city instead of having its terminal on Spring Grove Avenue as at present. If the idea is consummated it will mean that the subway, a part of the unfinished rapid transit system of the city, will be put to the use originally intended for it, that of bringing interurban lines to the center of the city. Failure of some of these lines while the system was being built almost obscured the idea behind the original plan. It is said that the use of the subway by the interurban does not present any insurmountable engineering obstacles. The subway could probably be made ready for use by an interurban for less than $300,000.

Investigators for Massachusetts Needs Named

The House membership of three on the special commission to investigate the rapid transit needs of Boston, Chelsea, Revere and vicinity have been announced by Speaker Hull. They are Representatives George A. Gilman and William H. Hearn of Boston and Newland A. Holmes of Weymouth.

Traffic Study of Pittsburgh Business Area

Some interesting figures have been developed in a traffic survey taken in the central business district of Pittsburgh, Pa. Between 8 a.m. and 6 p.m. 594,016 persons entered and departed from the business area using modes of transportation as follows:

		Per Cent
Street car	307,256	51.76
Passenger auto	119,200	20.08
Pedestrian	87,517	14.75
Steam railroad	65,375	10.98
Taxicab	9,500	1.60
Bus	4,915	0.83

Analysis showed that during the period of the count 21,228 more persons entered than left the business area, indicating that this number, approximately, remained downtown after 6 p.m. Another phase of the survey showed that automotive vehicles constituted 90 per cent and street cars 8 per cent of the vehicles using the downtown streets during this time, other vehicles, including those drawn by horses, making up the 2 per cent not already accounted for.

Fifty-Mile Interurban for Canada

The Winnipeg Power Company, Winnipeg, Manitoba, is planning to construct an electric railway to use surplus output of the recently authorized project at Seven Sisters Falls. It is expected that this line is to run from the Falls 14 miles to Whitehouse and thence 50 miles further south. The rails to be used have already been purchased and are ready to be laid.

Interurban cars from the Winnipeg-Selkirk line for passenger service will be used. For heavier traffic it is proposed to buy second-hand electric locomotives. Needed plant equipment will probably be bought in Canada on account of duty difficulties.

Not only is this a new development in power marketing, but it is the first railway electrification of its kind in western Canada.

Extension of Youngstown Grant Under Consideration

Study of the railway situation in Youngstown, Ohio, in which the Youngstown Municipal Railway operates under a modified service-at-cost grant, has been begun by a citizens' advisory committee appointed by Council President W. L. Buchanan. A. E. Adams, president of the First National and Dollar Banks, is chairman. At its first meeting on Sept. 24 the committee considered phases of the proposed new franchise.

The old grant expires in January. It provides that the city must decide on one of three courses: Extend the franchise for more than fifteen years; permit scrapping of the lines during the next fifteen years with permission of the company to charge off each year a certain amount of the capital value, or take over the lines for municipal ownership. The present franchise was drafted in 1919.

Under its provisions the company is entitled to a return of 7 per cent on capital invested, that return to be insured by a fluctuating fare.

Charges Made Against Des Moines Supervisor

An attempt was made recently to secure the removal of Col. Harry Wilkins, city street car supervisor of Des Moines, Iowa. Petitioners before the City Council charged that Colonel Wilkins had failed to use the office to better railway service or for suggesting ways and means for keeping the company out of the receivership, ordered on Nov. 11, 1927.

Under the present franchise, any member of the City Commission has power to nominate a new car supervisor, and the Council can remove and re-elect car supervisors at will. The petitioners suggested Andy Swanson to succeed Colonel Wilkins. The matter was referred to Councilman W. F. Mitchell, by whom Mr. Wilkins was named originally.

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Foreign News

Paris Surface Lines Show Increased Earnings

The report of the Paris Surface Railway and Bus System (Société des Transports en Commun de la Région Parisienne) for 1927 shows increased earnings of about 13.07 per cent, the aggregate earnings for the year amounting to nearly $25,000,000. During 1927 there was a decrease in passengers carried of 6.82 per cent compared with 1926. The increase in earnings with the reduction of passengers is accounted for by an increase in fares of approximately 25 per cent on Aug. 1, 1926. These increased fares were in force during all of 1927, but for only five months during 1926. The operating statistics are given in Table I.

TABLE III—PROFIT AND LOSS STATEMENT FOR 1927 OF S.T.C.R.P.

	Francs
Balance from previous year	251,153
Interest at 6 per cent paid by department on capital stock	3,600,000
Contract payment	4,190,075
Operating bonus earned under contract	4,580,230
Miscellaneous receipts	253,150
Operating revenue	12,874,608
Corporate operating expenses and sinking fund payments of company	5,227,224
Net income of company	7,647,384

TABLE I—STATISTICS OF S.T.C.R.P. FOR 1927

Kind of Service	Vehicle-Kilometers	Vehicle-Miles	Passengers Carried	Total Receipts—Francs	Total Receipts—Dollars
Tramways, electric	100,254,916	62,659,325	683,839,499	381,582,394	15,263,296
Tramways, steam	2,264,629	1,415,393	1,607,483	3,683,405	147,336
Total tramways	102,519,545	64,074,718	685,446,982	385,265,799	15,410,632
Motor buses, day service	53,627,004	33,516,878	328,867,981	219,685,981	8,787,439
Motor buses, night service	265,074	165,671	573,615	1,422,263	56,891
Total buses	53,892,078	33,682,549	329,441,596	221,108,244	8,844,330
Boats on the Seine	379,080	236,925	2,868,841	2,846,978	113,879
Miscellaneous passenger receipts (supplementary fares, etc.)	.....	.....	.....	172,284	6,891
Freight and package service	.....	.....	.....	7,518,002	300,720
Grand total	156,790,703	97,994,189	1,017,757,419	616,911,308	24,676,452

In its report the company points out, among other things, that wages now constitute 64.98 per cent of total receipts, and that payment for both taxes and power increased during the year more than 9,000,000 francs each.

The company's passenger, rolling and floating stock on Dec. 31, 1927, consisted of 2,287 electric motor cars, 875 electric trail cars, 1,411 buses of various types, 55 steamboats for use on the river and a number of miscellaneous smaller boats. In addition, the company had a short steam line for suburban use with 19 locomotives and 79 passenger cars.

New Subway in Oslo

Subway construction which has been under way for several years in Oslo, Norway, was completed recently and the subway was officially opened by the king on June 27, 1928. This underground line runs from the National Theater in the center of Oslo to Majorstuen at the city limits, and continues to Holmenkollen, Frognersaeteren, and other suburban points. Since there are no other stations in the city, the residents in the neighborhood of Majorstuen and the suburban stations will benefit chiefly by the new line.

The signal system installed is of a modern type which is being used for the first time in Norway, although it has been tested in several foreign countries and is actually in use in the Berlin subway. The system is entirely automatic and must necessarily operate with great precision, as the cars in times of heavy traffic may run with intervals of only 1½ minutes.

TABLE II—ANNUAL OPERATING REPORT OF PARIS TRANSPORTATION SYSTEM FOR 1927 WITH RESULTS AFTER AMORTIZATION CHARGES

	Francs	Dollars
Passenger operating revenue (cars, buses and boats)	609,393,305	24,375,732
Freight operating revenue	7,518,003	300,720
Miscellaneous operating revenue	6,055,500	242,220
Total operating revenue	622,966,808	24,918,672
Operating expenses	624,411,615	24,976,465
Net revenue from operation (deficit)	1,444,807	57,793
Fixed charges (including interest and amortization of purchase money and first cost)	83,785,423	3,351,417
Deficit of system	85,230,230	3,409,210
Remuneration paid to company for operation	12,370,305	494,812
Deficit of department	97,600,535	3,904,022

Note: 1 franc taken as equal to 4 cents.

Buys Pernambuco Utilities

The public utility properties of the city of Pernambuco, Brazil, have been acquired by the Emprezas Electricas Brasileiras, an American & Foreign Power Company subsidiary. Pernambuco, with a population of about 360,000, is a state capital and the center of a rich sugar and cotton district.

The purchase entails the taking over of the Pernambuco Tramways & Power Company, Ltd., an English company, which operated electric power and light properties, street cars, telephones and gas services. The Brazilian company earlier this month acquired a contract to conduct all the public services of Bahia, and has properties in Victoria, Porto Alegre and Curityba, Brazil.

New Tramcar at Plymouth

A new type of car, sixteen of which are being built at the Plymouth Corporation Tramway's own works, has been introduced on the tramway system. This car carries a total of 72 passengers, eighteen more than the capacity of any previous models. The inside seats are of the high-sprung mattress type, and covered in moquette, while, on top, tip-up leather chairs take the place of the former wooden seating. The panelling is in mahogany, and a new and improved system of lighting has been adopted, with two red lamps at the rear. The windows are of the salon kind, and can be raised and lowered easily. The car is fitted with air brake equipment.

Electric Locomotive Completed in Japan

The Shibaura Engineering Works has recently completed the manufacture of a 105-ton electric locomotive for the Imperial Government Railways. It is 20 meters in length and is said to have cost 200,000 yen.

London's Only Tunnel Tramway

Permission has been given the London County Council, London, England, to enlarge the tramway tunnel between the Thames Embankment and Southampton Row to allow the passage of double-deck cars.

This line is the only tramway connection north and south through the center of London, an area where no surface tramways are allowed. It was constructed about twenty years ago largely on the score of economy. The tunnel was made only high enough for single-deck cars. The traffic on the route has grown enormously and hence the need for double-deck cars with their greater carrying and earning capacity.

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Recent Bus Developments

New Bus Routes in Chicago

Right to operate 70-mile system awarded to independent company. Surface Lines sought similar grant

PERMISSION to add to its present 145-mile system approximately 70 miles of new bus route extensions on the west and northwest sides of Chicago was given to the Chicago Motor Coach Company by the Illinois Commerce Commission on Oct. 2. Regular twenty-minute bus service was started the following day on Diversey, Austin and Sacramento Avenues, and coaches are expected to be in operation on all new routes within three weeks. Among the other lines which are to be extended are routes 44, 45, 31, 32 and two short routes on the southwest side.

John A. Ritchie, president, has announced that the company has arranged to borrow 120 buses from the Omnibus Corporation in New York and St. Louis until the new ones necessary to take care of the additional service are delivered. It is understood that the company will purchase a fleet of new single-deck, 22-passenger Yellow city-type coaches for its extended operations.

A petition asking the commission for authority to establish 100 miles of new bus routes was filed by the Motor Coach Company on May 16. The application was opposed by the Chicago Surface Lines, which sought permission to provide feeder bus service on the same streets at a 7-cent fare with free transfers. The motor coach company asked a 10-cent fare.

Responding to petitions signed by thousands of northwest side residents who favored the Surface Lines' co-ordinated coach and rail service, the City Council last month drafted and approved fourteen separate Surface Lines bus ordinances, only to have them vetoed by Mayor W. H. Thompson on the grounds that they were illegal. The Illinois Commerce Commission likewise decided against the feeder bus franchises, maintaining that the Surface Lines have no legal right to use any part of their equipment funds for the purchase of buses and for other expenses in the operation of feeder bus lines. It was the commission's opinion, furthermore, that feeder bus operation might interfere with the permanent transit settlement now being worked out by the City Council.

Although the City Council last week repassed the ordinances over the Mayor's veto, commentators agree that no further action can be taken in the matter until the courts decide upon the legal status of feeder buses.

The Chicago Surface Lines has been operating a line of feeder buses on the north side of the city for more than a year under Judge Oscar Hebel's ruling that such operations were justified by the emergency existing. The Chicago Motor Coach Company appealed this decision, but just before the present applications were filed abandoned the appeal.

Buses to Wappingers Falls

Members of the Board of Supervisors at Poughkeepsie, N. Y., have voted in the affirmative on the purchase of the South Road right-of-way of the Poughkeepsie & Wappingers Falls Electric Railroad. As a result the county has accepted the less expensive of the two alternatives for the acquisition of land for the widening of the Albany Post Road when it is rebuilt from Wappingers Falls to Poughkeepsie.

The railway will be paid the agreed purchase price of $150,000 when the state Department of Public Works requests the county acquire land for the new right-of-way. All rails and equipment owned by the company must be removed by Jan. 1, 1929. Under these conditions, the company must proceed almost at once to remove the rails and wires in the South Road, but highway officials say the South Road will not be reconstructed until 1930.

To maintain its service to Wappingers Falls, the railway must obtain the consent of the Public Service Commission to operate buses over the route and it also must obtained consent from the town of Poughkeepsie and the village of Wappingers Falls. It seems unlikely that either the town or village will actively oppose the operation of buses. The company is prepared to change to buses as soon as consent and permission are secured.

Operation Continues in Palo Alto

In a supplemental order the California Railroad Commission has authorized the Peninsular Railway to continue the operation of buses in Palo Alto until Sept. 30, 1929. The ruling is conditioned on the company's discontinuing this service on 90 days' notice to the city authorities in the event that the revenues derived are not sufficient to pay operating expenses, depreciation, taxes and 6 per cent on investment required.

All Local Service in Paterson

The discontinuance of the Park Avenue railway line, in Paterson, N. J., by the Public Service Co-ordinated Transport will remove from the streets of Paterson the last trolley car operating wholly within the city and leave only those being operated on the Hudson River, Newark and Hoboken lines, all other public street transportation being carried on by means of buses. There were eight street car lines in Paterson as recently as three years ago. The population of Paterson is 143,000.

Iowa Ton-Mile Tax Upheld

The Iowa motor carrier law, under which operators of buses and trucks between fixed terminals are required to pay a ton-mile tax for the use of the public highways, was unanimously upheld by the Iowa Supreme Court in a full bench opinion handed down on Sept. 28.

The law was attacked by the Iowa Motor Vehicle Association on the ground that it was discriminatory. The first legal test of the issue was in the Polk County District Court, where Judge W. G. Bonner ruled there was nothing unconstitutional in the statute. The high court upheld Judge Bonner.

The Supreme Court decision was written by Justice Lawrence De Graff. He declared the statute violates neither the state nor the federal constitution. The ruling points out that the appellants, the carriers, comprise a class "entirely separate, distinct and different" from other motor vehicles operating over the highways of the state.

One of the main objections raised by the Iowa Motor Vehicle Association was that the measure discriminated against them in that it failed to charge ton-mile fees to operators of taxicabs, farm trucks, oil trucks, moving vans, funeral cars and miscellaneous carriers in general use on the highways.

However, the court emphasized that such use of the public roads "is without any conscious or organized effort to create or assemble or concentrate traffic for hire upon particular localities or sections of the highway."

The court went on to explain that, "the right of a citizen to travel upon the highway and transport his property thereon in the ordinary course of living and business is radically different from that of one who makes a certain portion of the highway his place of business and uses it for private gain in the transportation of freight and passengers is under the terms of the statute in question."

Another decision of the court of wide importance in the field of highway transportation in Iowa settled the disputed question as to whether the State Board of Railroad Commissioners can enforce its orders in granting or refusing certificates to common carriers under the same law. In this case the court upheld the law which gives the board full power to go to court to enforce its jurisdiction over motor common carriers.

The court reversed the decision of Judge C. C. Hamilton of Woodbury County, who held that the board could not bring suit to enjoin W. J. Holdcraft, who was refused a certificate to operate a line between Sloan and Sioux City, both in Iowa.

Mid-State Coach Sale Postponed

The sale of the Mid-State Coach Lines, Syracuse, N. Y., at public auction scheduled for Aug. 15, was deferred until Sept. 15 and then postponed until Oct. 15. Several railways in New York state are interested in this project.

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Financial and Corporate

The Story of the Pass in Des Moines

The ratio of weekly pass revenue to total passenger revenue, and the average number of rides taken on the weekly pass sold by the Des Moines City Railway, Des Moines, Iowa, are practically constant regardless of the season of the year or the condition of the weather. Figures gathered over a period of slightly more than six months, beginning last February, show that the relation of pass revenue to the total stays around 36 per cent, while the average number of car rides taken by pass users approximates 27.

Week		Percentage of Weekly Pass Revenue to Total	Number passes Sold	Average rides per Pass
Feb.	12 to 18	35.78	12,413	26.4
	19 to 26	37.41	13,081	26.6
	26 to March 4	37.66	12,895	27.2
March	5 to 11	39.15	12,989	26.3
	12 to 18	37.22	12,418	26.7
	19 to 25	37.55	12,648	26.9
	26 to April 1	36.89	12,305	27.3
April	2 to 8	35.69	12,073	26.7
	9 to 15	36.60	12,151	26.8
	16 to 22	37.14	12,147	27.3
	22 to 29	37.23	11,974	27.0
	30 to May 6	36.18	11,578	27.0
May	7 to 13	37.15	11,800	27.4
	14 to 20	35.95	11,247	27.3
	21 to 27	36.96	11,481	27.4
	28 to June 3	34.15	10,603	26.8
June	4 to 10	35.14	11,157	26.8
	11 to 17	36.12	10,922	27.0
	18 to 24	37.13	10,960	26.6
	25 to July 1	36.61	10,742	27.5
July	2 to 8	34.95	9,787	26.7
	9 to 15	36.17	10,419	28.2
	16 to 22	36.12	10,155	27.5
	23 to 29	36.41	10,078	27.2
	30 to Aug. 5	34.13	9,747	28.5
Aug.	6 to 12	36.24	10,089	27.4
	13 to 19	34.23	9,829	26.5

Although the number of weekly passes sold was much larger during the winter and spring months, the number of rides per pass remained almost constant, and the ratio of pass revenue to total passenger revenue remained about the same. Des Moines has a flat 10-cent cash fare, but the constant car riders, through the $1.25 weekly pass, are enjoying a fare that averages slightly under 5 cents.

Number of Cash Riders Reduced in Omaha

A curious result has followed the experiment recently entered into by the Omaha & Council Bluffs Street Railway, Omaha, Neb. For several years it has been selling six tickets for 40 cents. After President Shannahan took charge, he acceded to a demand that three be sold for 20 cents. As a result the number of passengers has been stimulated about 5 per cent, but the number of cash fares paid has been so reduced that revenues have been cut nearly 3 per cent.

The August report of the company shows that, compared with August a year ago, revenues decreased from $216,093 to $210,093. Operating expenses were practically the same, $166,700, and with taxes deducted there was a net operating income of $16,651, compared with $25,427 for August, 1927.

When some months ago the bondholders agreed on an extension at the time their securities fell due, they insisted on a higher rate of interest, with the result that for August the company fell short of meeting its interest obligations by $25,364, compared with $11,413 a year ago.

Will Consider Hudson Valley Abandonment

Stockholders of the Hudson Valley Railway will meet on Oct. 11 to pass upon a resolution approved by the board of directors at a recent meeting in New York City calling for the abandonment of all of its lines now operating. The resolution provides for the abandonment of the Lake George-Glens Falls-Saratoga and the Stillwater-Troy interurban lines and the local line from Glens Falls and Hudson Falls to Fort Edward and Glens Falls to South Glens Falls, N. Y. If approval of the stockholders is secured operation of the trolleys will cease, after sanction by the Public Service Commission and a reasonable notice to the public. Officials of the company did not reveal what steps might be taken to accommodate the public on the heavily patronized branches.

The Delaware & Hudson Company and the United Traction Company, owners of the Hudson Valley system, have operated it with increasing loss for years, despite the lopping off of units on which the liability was heaviest.

Combined California Earnings Reported

PUBLIC utility corporations operating under the jurisdiction of the California State Railroad Commission had an increase in total operating revenue for the calendar year 1927 of $23,718,871 over that for 1926, according to the annual report of the department of finance and accounts of the commission, just compiled.

Electric railways reported total operating revenue for the year of $58,964,373, compared with $58,634,283 in 1926, operating expenses of $49,355,803 and $48,381,640 for 1927 and 1926, respectively, resulting in net operating revenue of $9,608,570 and $10,252,642, or a decrease of $644,072. A decrease was noted in revenue passengers transported, 708,641,500 being carried in 1927, against 712,569,466 the previous year.

June Quarter Profitable in Syracuse

An increase in business is shown in the financial statement of the New York State Railways, Syracuse, N. Y., as filed with the Public Service Commission for the quarter ending June 30. Operating revenues increased over those of a corresponding period a year ago, to the extent of $53,294. The total was $497,728 for 1928 and $444,434, for 1927. Fixed charges were also less, while the net corporate income increased by nearly $60,000. The comparative figures follow:

	1927	1928
Operating revenues	$2,390,955	$2,402,929
Operating expenses	1,797,079	1,752,466
Net revenue, railway operations	$593,876	$650,463
Net deficit, auxiliary operations	1,098	139
Net operating revenue	$592,778	$650,325
Taxes assignable to railway operations	148,444	152,595
Operating income	$444,434	$497,728
Non-operating income	23,415	22,596
Gross income	$467,748	$520,325
Deductions from gross income—		
Rent for leased roads	13,056	12,616
Interest on funded debt	322,736	322,550
Other deductions	14,117	13,912
Total deductions from gross income	$379,066	$373,696
Net corporate income	$88,682	$146,620

Projected Purchase Involves East St. Louis Properties

The Union Electric Light & Power Company, St. Louis, Mo., has petitioned the Missouri Public Service Commission for permission to purchase from the North American Company the East St. Louis & Suburban Railway, the Alton Railway, the St. Louis & Alton Railway, the Alton Light & Power Company, the Alton Gas Company and the Union Electric Light & Power Company of Illinois, operating company for the Cahokia Power plant south of East St. Louis, Ill., which supplies the Union Electric Light & Power Company of St. Louis with much of its power.

For these properties the price would be $18,111,697, arrived at as follows: cash cost to North American Company of acquiring properties, $11,377,556; undistributed surplus of various companies, $2,068,725 and money advanced $4,665,414. The Union Electric Company, which is also controlled by the North American Company, would pay the holding company 420,000 shares of no par value common stock at $25 a share, or $10,500,000, and the balance from the accumulated surplus of the Union Electric, or $7,611,697.

The price agreed to for the East St. Louis & Suburban is $3,964,612 and for the four Alton companies, $2,422,944. Bus lines operated by the railways would be involved in the transfer.

The chief purpose of the transfer is to place control of the North American Company's subsidiaries in the St. Louis district under the Union Electric Light & Power Company, of which Louis H. Egan is president.

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Partial Dividend Paid in Harrisburg

The Harrisburg Railways, Harrisburg, Pa., has resumed dividends on its preferred stock. Stockholders received checks on Oct. 2 for a 2 per cent semi-annual dividend on the 6 per cent (annual) cumulative preferred issue. It is presumed the dividend was made possible by the increased revenue due to the recent advance in fares from 6 to 7 cents.

The 2 per cent dividend is 1 per cent less than the normal 3 per cent semi-annual dividend for which the company is obligated, and the omission of the 1 per cent at this time makes a total of 30 per cent of dividends accumulated in the last decade. The company has never paid any dividend on its common stock.

The dividend due on April 1 last was omitted because of reduced revenues under the old 6-cent fare. Three months after passing that dividend the increase in the fare was announced.

11,187,173 Passengers in Cincinnati in August

The Cincinnati Street Railway, Cincinnati, Ohio, transported 11,187,173 passengers during August, and found itself with $419,997 in the fare control fund at the end of the month—$15,303 less than the sum in the fund at the end of July. The report follows:

Operating revenue		$725,925
Operating expense		525,441
Net operating revenue		$200,483
Taxes		69,234
Operating income		$131,349
Non-operating income		3,240
Gross income		$134,490
Rental, interest, sinking fund and return on capital		149,794
Deficiency		$15,303
Total in fare control fund, July 31, 1928		$435,201
Revenue passengers	8,285,514	
Transfer passengers	2,777,643	
Free passengers	124,016	
Total passengers carried	11,187,173	

Initial Engineers Public Service Common Dividend

The Engineers Public Service Company New York, has declared an initial dividend of 25 cents quarterly on its common stock, placing the issue on a $1 annual basis. The directors have also announced that, beginning on April 1 next, the company will also pay stock dividends on the common stock at the anual rate of 1-25 of a common share on each common share held. There are 3,000,000 shares of no par common stock authorized of which 897,240 shares were outstanding at the end of 1927.

Quarterly dividends at the rate of $5 per annum have been paid regularly on 320,000 shares of $5 cumulative convertible preferred stock of no par value, of which 400,000 shares are authorized. There is no funded debt.

Among the properties which the company controls is the Virginia Electric & Power Company.

Danbury and Bethel Utilities Merge

The Danbury & Bethel Gas & Electric Light Company, Danbury, Conn., has acquired the franchise and equipment of the Danbury & Bethel Power & Transportation Company, covering the town of Newton, Conn., and the district between the towns of Danbury and Monroe on the Housatonic River.

Traffic, Fare and Wage Figures

The number of revenue passengers, including bus passengers, reported by 225 companies to the American Electric Railway Association for August, 1928, compared with August, 1927, is as follows:

Aug., 1928	772,661,141
Aug., 1927	782,111,878
Decrease, per cent	1.21

The variation in the percentage decrease from the corresponding month of the previous year, amounting to 1.21 per cent, is accounted for mainly by the fact that weather conditions in August, 1928, were practically normal, that is, it was hot and sultry for the most part and generally fine, which condition stimulates private automobile riding to a great extent. August, 1927, was one of the coldest, wettest and dreariest summer months on record, and undoubtedly railway traffic was thereby stimulated.

Average cash fare in cities of 25,000 population and over:

	Cents
Sept. 1, 1928	8.2155
Aug. 1, 1928	8.1767
Sept. 1, 1927	8.0449

The increase in the average fare was produced by an increase in Lynchburg, Va., from 5 cents to 7 cents, an increase in Roanoke, Va., from 5 cents to 7 cents, an increase in Sacramento, Cal., from 5 cents to 7 cents, an increase in Schenectady, N. Y., from 7 cents to 10 cents, and an increase in Stockton, Cal., from 6 cents to 7 cents. The changes in Sacramento and Stockton, previously reported as effective in July, were not effective until later. The average fares for Aug. 1 and Sept. 1, 1928, have been adjusted accordingly.

The average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track were:

	Average Hourly Rate Cents	Index Number 1913 = 100 Per Cent
Sept. 1, 1928	57.48	210.94
Aug. 1, 1928	57.48	210.94
Sept. 1, 1927	57.27	210.17

Vote on Purchase of Philadelphia Underliers Postponed

The Mackey Administration at Philadelphia, Pa., has abandoned its plan to obtain electoral approval at the November election of the contemplated purchase of the Philadelphia Rapid Transit Company underliers at a cost of $139,000,000.

At Mayor Mackey's suggestion, however, the City Council's transportation committee unanimously passed a resolution calling for a popular vote on municipal acquisition of the P.R.T. subsidiaries "at the earliest practicable moment." It is proposed that a special election be held in February.

That legislative action followed a stormy session on Oct. 1, during which the Mayor. city and P.R.T. officials and W. W. Atterbury, president of the Pennsylvania Railroad, were questioned by George J. Campbell, president of the United Business Men's Association.

General Atterbury explained that the $80,000,000 program of the Pennsylvania Railroad in connection with its proposed West Philadelphia Terminal would suffer radical reduction unless the city votes to purchase, through condemnation proceedings, the franchises of the street car underlying companies in Philadelphia.

In his prepared statement the railroad president reviewed the plans to erect a new station and said that "nearly every step of the way, in one form or another, we have been met by objections from the underlier companies."

General Atterbury urged that the city take over the underliers and transform part of the present Market Street elevated into a subway west of the Schuylkill River. The railroad plans to run trains into Broad Street from the projected West Philadelphia Station through a tunnel under the river.

The P.R.T. has pointed out that when the city becomes its landlord in place of the underliers, the $8,300,000 rental will be more than sufficient to meet the fixed charge on the $139,000,000 borrowed for the acquisition of the underliers' holdings and that an annual saving in the transaction of $1,000,000 a year will accrue to the city.

Furthermore, the P.R.T. contends the city will have a voice with the P.R.T., with the Public Service Commission as choirmaster, in the ultimate disposition for the benefit of the car riders of the $1,400,000 a year tax charges paid on account of the underliers which the P.R.T. will save when the city is in a position to exercise proper control.

New Directors on Eastern Massachusetts

L. Sherman Adams, Roger Amory and F. T. Miller have resigned as directors of the Eastern Massachusetts Street Railway, Boston, Mass. Their successors are H. R. Hardwick and F. H. Baird of Hayden, Stone & Company, and N. L. Amster.

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Favorable Showing in Toledo Under New Plan

Under the new transit plan which has combined the bus and railway service of Toledo, Ohio, under the single control of the Community Traction Company, revenues are showing a gain and elimination of duplicated services has enabled some cuts to be made in cost of operations. These facts were disclosed by the report of Commissioner E. L. Graumlich to the street railway board of control at its September meeting. A net surplus of $11,907 after all taxes, expenses, and charges for required reserves was shown for August operations compared with a deficit of $44,590 for August, 1927. Commissioner Graumlich indicated that elimination of competitive service would add approximately $250,000 to the revenues in a year.

The August report showed total revenue of $293,637 comparing with $264,370 and passenger revenue $272,852 compared with $247,833 for August a year ago. The railway system alone had operating revenue of $242,683. Operating expenses were $159,880 and taxes $15,666, which gave a net income from railway operation of $67,137, compared with $34,896 last year.

Coach revenue totaled $49,808 against $21,253 for August last year. New lines are largely responsible for this big gain. Net income was $4,616. Increasing traffic is held largely responsible for the better average revenue and lower average cost of operation.

The traction system has put in a new system of transfers in which colors indicate groups of parallel routes and hour is indicated by length of the transfer. While more extensive operations have been responsible for a 1 per cent increase in transfers purchased there has been an 8 per cent increase in the purchases of the regular token fares. Commissioner Graumlich says this showing indicates that a considerable amount of return riding by means of transfers has been eliminated. The company is now getting the benefit of lower power rates, a power refund, and has been enabled to increase its depreciation set-up and cut down its monthly accident charge.

From several sources the company has been asked to establish a 5-cent fare for school children. Present fares are 1 cent for children eight years or younger and straight token or 10-cent fares for all others.

Ohio Interurban to Suspend Railway Service

Abandonment of the Columbus, Newark & Zanesville Railway, Newark, Ohio, between Columbus and Zanesville, is proposed by the Southern Ohio Public Service Company. The railway furnishes current for light and power to towns and communities along its line. This part of the company's business is showing a profit while the interurban cars are operated at a deficit. The application to the Public Service Commission for the right to suspend will be heard on Nov. 1. The railway will contend that it is operating at a heavy loss, and that its railway revenues are constantly decreasing to such an extent that its receipts do not meet its operating expenses. The company will continue its electricity and power service.

Abandonment of the railway as proposed would enable the Columbus Railway & Light Company, Columbus, Ohio, to save a part of the $160,000 that it otherwise would be required to spend on new tracks, special work and turnouts to provide a new route for the cars of the interurban in East Main Street.

Additional Issue of Arkansas Power & Light

A syndicate including Harris, Forbes & Company, New York, is offering an additional issue of $3,000,000 first and refunding mortgage gold bonds of the Arkansas Power & Light Company at 96¼ and interest, yielding more than 5.25 per cent. The bonds are dated Oct. 1, 1926, and are due Oct. 1, 1956. The Arkansas Power & Light Company operates the electric railway systems in Little Rock and Pine Bluff. The company is included in the system of the Electric Power & Light Corporation.

Hydro to Operate Windsor Road

Legal technicalities that have a bearing on the taking over of the Windsor Essex & Lake Shore Railway by the Ontario Hydro Electric Power Commission have been straightened out at a conference attended by the Premier, members of the Hydro Commission and J. H. Rodd of Windsor, counsel for municipalities interested in the road's operation. The taking over of the radial line was authorized at the last session of the Legislature.

The Premier said:

The chief difficulty at present, is that since the different municipalities have been formed into one unit, they have not the authority to create working capital. I have told them to go ahead and that we should ratify their action by legislation at the next session.

It seems likely now that Hydro operation of the road will be commenced without further delay.

New Director in Boston

Edwin M. Richards, New York, has been elected a director of the Boston Elevated Railway, Boston, Mass. He succeeds the late Henry S. Lyons.

Legal Notes

FEDERAL CIRCUIT COURT OF APPEALS—*Combined Street and Interurban Railway Cannot Take Advantage of Federal Bankrupt Act.*

The federal bankrupt act provides that any person "except a municipal, railroad, insurance or banking corporation," may become a voluntary bankrupt. The Circuit Court of Appeals, Fourth Circuit, held that the Columbia Railway, Gas & Electric Company, operating 20 miles of lines in Columbia, S. C., and neighboring villages, was more of a "railroad" than a simple street railway in one town or city, and could not take advantage of the act, thus affirming decision in the case of the same company in 24 F. (2d), 828, and 25 F. (2d), 329. [Columbus Ry. Gas & E. Co. vs. State of South Carolina, 27 F. (2d), 52.]

MARYLAND—*Basis for Determining Fair Return on Fair Value of Utility Property.*

The Public Service Commission acts for the Legislature, and as it is informed by experience and assisted by a trained corps, its establishment of rates for a public utility cannot be disturbed except on clear evidence that its decision is unreasonable and unlawful. A schedule of rates by such a commission permitting a return of 6.26 per cent on the fair value of the utility's property is not confiscatory. The return calculated, however, should be sufficient to include an allowance for depreciation, which should be based on the present value of the property, not on its original cost or taken as a percentage of its gross revenue. Such allowance should include loss from ordinary obsolescence, but need not include loss from extraordinary obsolescence, as its occurence in the future is a matter of speculation and conjecture. [West vs. United R. & E. Co., 142 A, 870.]

ILLINOIS—*Income Tax Deductible to Determine Net Revenue Under Agreement.*

A railway and a city entered into an agreement twenty years ago under which a percentage of the net revenue of the company should be paid to the city. Later the federal income tax was imposed. The court held it to be a tax on the real and personal property of the company within the meaning of the ordinance and that it was a deductible item before the net revenue was determined. [City of Chicago vs. Chicago City R. Co., 245 Ill. App., 473.]

MASSACHUSETTS—*Company Not Responsible for Injury From Automatically Closing Door.*

A passenger on a crowded platform placed his hand against the edge of an opened sliding door and did not remove it before it was caught between the door and the casing into which the door slides when closing. There was no evidence that the guard knew or was careless in not knowing that the hand was in a place of danger, or that the crowd striving to enter was unusual and called for special precautions. The accident was a mishap of travel and not due to negligence, and the trial judge was not in error in directing a verdict for the

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defendant. [Power vs. B.E.R., 161 N.E., 623.]

MINNESOTA—*Employee in Emergency is Not Required to Adopt the Wisest Course.*

A street car was caught on a railroad crossing which it had entered while the gates were up. The one-man car operator had not gone forward to look for an approaching train, as required by the rules. Both steam railroad and electric railway requested the court to charge that in an emergency involving danger to the lives of others, an employee was not negligent merely because he did not adopt the wisest or best means of avoiding an accident. The refusal to give this charge was reversible error. [Sandberg vs. Great N. R., 220 N.W., 949.]

NEW JERSEY — *Ordinance Against Double-Deck Buses With Solid Tires Held Unreasonable.*

The city of Camden passed an ordinance prohibiting the use of double-deck autobuses not equipped with pneumatic tires in certain parts of the city. It was declared void by the court because unreasonable, the weight and not the height of the vehicle being the proper basis for classification for regulations to conserve the highway, in the opinion of the court. The offending company operated interstate buses, but this fact was held not to have affected the operation of the law against the defendant's buses, provided the law had been legal otherwise. [Pennjersey R.T. Co. vs. City of Camden, 142 A., 821.]

NEW YORK—*Refusal to Charge that if Collision Occurred as Specified by Certain Witnesses the Railway was Not Negligent, Held Error.*

Witnesses for a railway testified that a taxicab driver attempted to cut in front of a car between crossings when there was not sufficient room to do so, and the motorman was unable to stop the car in time to avoid an accident. The counsel for the railway requested the court to charge that if the jury believed these witnesses, the company was not liable. The neglect of the court to do so was held prejudicial error.—[Liggio vs. Third Ave. Ry. Co., et al, 229 N.Y.S., 537.]

OHIO—*Policy in Issuing Transportation Certificate Defined.*

The purpose of the Ohio Motor Transportation Act is to serve the public convenience and necessity, as distinguished from serving the advantage and profits of motor transportation companies. It is not the policy of such legislation to create destructive competition with existing transportation facilities and thereby decrease or destroy them. The grant of a certificate which will result in depriving the public of an equal or greater existing transportation facility is opposed to public convenience and necessity. It is the duty of the Public Utility Commission to permit an existing railway company to make its service adequate, if it is not already adequate, before granting a certificate to a motor transportation company to render competing service. [Stark E.R. Co. vs. P. U. Comn. of Ohio et al., 161 N.E., 208.]

SOUTH DAKOTA—*Duty of Driver of Automobile Approaching a Crossing Defined.*

An automobile driver approaching a street intersection saw a trolley car about 200 ft. away. He then tried to avoid a collision by crossing ahead of the car but was struck. The street car was exceeding the speed permitted by ordinance. Two extended instructions requested by the defendant's counsel were upheld in the Supreme Court as correctly stating the law as applied to tracks. One was to the effect that the plaintiff, after first seeing the car, should have paid reasonable attention to it and not tried to cross the track unless he had plenty of time to do so. While he had a right to assume the car was not running more than 12 m.p.h. (the legal limit), as soon as he could have learned by reasonable care and observation that it was running faster than this speed it was his duty to stop his automobile and not take any chances at the crossing. The second instruction declared that as the car had a right of way on its rails by law and the necessities of the case, the driver should have approached the crossing at a speed not greater than allowed by ordinance or 8 m.p.h. When he arrived at a point where he could see up the track, he should have looked to see if a car was approaching. [Miller vs. Sioux Falls T.S., 220 N.W., 451.]

WISCONSIN—*Validity of Highway Tax Upheld.*

The constitutionality was upheld of a law imposing a ton-mile tax on all auto transportation companies operating motor vehicles for compensation upon a public highway between fixed terminals or over a regular route, but exempting hotel and school buses, vehicles transporting agricultural or dairy products and freight and passenger vehicles within municipalities, and requiring freight trucks to pay double the tax imposed on passenger vehicles. [State ex rel N.P. Co. vs. Railroad Comm. of Wis. et al., 220 N.W., 390.]

Personal Items

S. W. Coleman, Former Railway Man, Retires from Utility Field

S. Waldo Coleman, California utility operator and financier, has retired from the public utility field, following the sale of the Coast Counties Gas & Electric Company, of which he was president, to A. E. Fitkin. Mr. Coleman devoted his entire career to the electrical industry in the West. After obtaining some practical engineering training in the shops of the General Electric Company he became connected with the Petaluma & Santa Rosa Railroad Company as master mechanic, moving to Santa Cruz in 1906 as manager of the Union Traction Company.

In 1908 Mr. Coleman was made manager of the Coast Counties Gas & Electric Company and in 1913 he became president, taking charge of the affairs of that organization in its San Francisco office. He devoted his attention especially to public relations and was an early advocate of customer ownership.

Mr. Coleman is a member of the American Institute of Electrical Engineers.

R. L. Horsfield New Manager at Leeds

The tramways committee of Leeds (England) City Council unanimously agreed on Sept. 11 to recommend the appointment of R. L. Horsfield to the post of general manager and engineer of the city's tranmway and transport department, succeeding W. Chamberlain, who has accepted the position of general manager of Belfast City Tramways.

Mr. Horsfield has held leading positions with Bradford & Walsall Tramways, and since 1920 has been general manager of the Cardiff Tramways. Both in Walsall and Cardiff he opened up bus services as auxiliaries to the municipal tramways. For the year 1926-1927 he was president of the Municipal Tramways & Transport Association.

W. Chamberlain Heads Association

At the annual conference of the Municipal Tramways & Transport Association held in Manchester, England, from Sept. 12 to 14, W. Chamberlain, hitherto general manager of the Leeds Tramways, and now about to take up a corresponding position with the Belfast Tramways, was elected president of the association for the ensuing year.

GEORGE A. COOPER, superintendent of materials of the Monongahela-West Penn Public Service Company, Fairmont, W. Va., has been appointed an assistant chief business specialist in the Division of Simplified Practice of the Bureau of Standards, United States Department of Commerce. Mr. Cooper has had considerable experience in the actual application of simplified practice within a company as his concern reduced its financial investment in inventory by 33 per cent and eliminated 16 per cent of items carried in stock.

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Track Material Buying Continues Brisk

Market for line materials also active. Boston Elevated extension proposed. Terminals for St. Louis and Aurora to start soon

CONFIRMING earlier reports that the market for track and line materials is continuing to be active, this week's reports from a number of electric railways show substantial purchases of these products. The Georgia Power Company, Atlanta, Ga., has ordered a minimum car of 70-lb. A.S.C.E. rail. Other track equipment ordered by this company includes a special curve, 350 6-in. x 8-in. x 8-ft. cross ties, 750 AA-5, Arcweld bonds, and signal equipment. Ten thousand creosoted red oak ties have been ordered by the Cleveland Railway, Cleveland, Ohio.

Chicago Surface Lines, Chicago, Ill., has ordered 1,000 ft. special rolled guard rail for 5-in. 80-lb. rail, 250 gross tons of 9-in. 145-lb. rail, and during the previous month 2,000 gross tons of 9-in. 130-lb. rail and 42 special track layouts. Ten steam and electric railroad crossings, 215 tongue switches, forty 9-in. 90-deg. S. P. crossings, forty type B crossover frogs, twenty-two 9-in. type B spiral frogs, forty-two type B crossover frogs, and twenty-two 7-in. tongue switches are included in other orders. This company also purchased 15,000 6-in. x 8-in. x 7-ft. long-leaf yellow pine ties. Paving materials was another large item purchased, including 12,000 square yards of granite blocks, 5,000 square yards of 4-in. yellow pine paving blocks, and during the month previous 100,000 vitrified repressed paving bricks. Other equipment purchased by this company includes 100 Toledo wheelbarrows, 6,000 ½x6x11-in. tie plates, 13,000 rail clips, 12,000 T-head bolts and nuts, 1,500 tie plate wedges, 2,500 tie plate clips, 2,000 ft. of ¾-in. pneumatic hose, 100,000 Fetter drive screws, 17,000 M.I. rail clips, and twelve paving breakers.

The Denver Tramway Corporation, Denver, Col., has ordered 30,000 6-in. x 9-in. x 6-ft. spur cross ties treated, 10,000 6x9-in. flat bottom tie plates, 350 pairs of fish bars for 52-lb. rail, and 100 kegs of $\frac{5}{16}$x5½ in. track spikes. Cement, lumber, track bolts, tie plates and spikes to the value of $10,000 have been purchased by the Portland Electric Power Company, Portland, Ore. Ten thousand ties, 45 tons of rail, 3,800 tie plates, 300 pairs of splices, and 59,100 lb. of asphalt were ordered recently by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. Virginia Electric & Power Company, Richmond, Va., has placed orders for 50 kegs of track bolts, 200 rail tierods, 50 rail plates, 101 rail bonds, and 25 kegs of track spikes. Washington Railway & Electric Company, Washington, D. C., contemplates the order of four Chicago-Pneumatic Company Type MM back fill tampers.

The United Electric Railways, Providence, R. I., has ordered special track work, 16,000 tie plates, 1,000 5-ft. 2-in. tierods, 250 kegs of track spikes, 90 kegs of track bolts, and 500 36-in. bonds. Other track equipment ordered by this company includes 50 grinding wheels, one complete reciprocating car grinder equipment, one gross Toledo torches, 25 grinding wheels, 300 corundum bricks, two lots of special work, 250 rail weld portion, 4,000 tie plates and 1,000 flat tierods.

The Northern Ohio Power & Light Company, Akron, Ohio, is rebuilding its track from Bowery to State Street. When this work is completed new track will be laid between Mill and Bowery Streets on Main Street. The Public Service Company, St. Louis, Mo., has started work constructing a loop at Third Street and Franklin Avenue, and finishing the double tracks on Franklin as far west as Ninth Street.

Permission has been granted the Delaware Electric Power Company, Wilmington, Del., to lay a double track across the new Market Street Bridge. A new loop will be constructed along the Lawrence Road by the Trenton & Mercer County Traction Corporation, Trenton, N. J.

The Dominion Power & Transmission Company, Hamilton, Ontario, proposes to rebuild, 5,000 ft. of double track on Burlington Street, from James Street to Wellington Street, with 90-lb. rail and steel ties. This company is rebuilding about 1 mile of double track, using 90-lb. girder rail and steel ties.

Power and Line Materials

Ten cars of poles and two cars of W. P. wire have been ordered by the Milwaukee Electric Railway & Light Company. This company also contemplates the purchase of one car of insulators. Five hundred marathon ears, 100 trolley splicing ears, 100 trolley yokes, twenty trolley frogs and two reels of trolley wire have been ordered by the Virginia Electric & Power Company.

The Denver Tramway Corporation has ordered 100 class D 30-ft. western red cedar poles. One-half carload of hard-drawn bronze round trolley wire has been ordered by the Cleveland Railway. The Georgia Power Company has ordered 175 35-ft. creosoted pine poles, and 125 30-ft. creosoted pine poles. Poles, wire and miscellaneous line hardware to the value of $20,000 have been ordered by the Portland Electric Power Company.

Five miles of No. 10 three strand galvanized iron wire, 5,000 ft. of $\frac{5}{16}$-in. seven wire Copperweld span wire, 500 No. 00 trolley ears, 500 caps and cones, 50 No. 00 R.M. frogs, and 50 No. 00 20-deg. L.M. frogs have been ordered by the United Electric Railways. Forty-seven tubular steel poles have been ordered by the Washington Railway & Electric Company.

Electric equipment ordered by the Chicago Surface Lines include 125 long-leaf yellow pine poles creosoted, 8 in. x 35 ft.; 500 Tru-Lay span centers, 56 three-cell unit aluminum lightning arresters, 6,260 lb. of cast lead burning strips; 720 pairs of split pole sleeves. The electrical department of this company has also ordered 90,000 lb. of sulphuric acid, gravity 1,600; 70 shallow lead-lined tanks; 3,000 wood separators; 480 oil insulating units; 90 pieces of 22⅝x20⅛x⅜ in. rough skylight glass and 396 pieces of 23$\frac{5}{16}$x27⅞ x⅜ in. rough skylight glass.

Car Repair Parts

The Georgia Power Company has ordered 250 26-in. car wheels and 300 6-in. trolley wheels. Three thousand dollars worth of car repair parts were ordered by the Portland Electric Power Company. The Connecticut Company, New Haven, Conn., is equipping twelve cars for treadle-operated exit doors. The Dallas Railway & Tramway Company, Dallas, Tex., has ordered 150 steel car wheels.

Four hundred cast grids, five sets of armature coils, 600 lb. of sweeper rattan, 15 G.E. 80-19 tooth pinions; 500 R.G. cast grids; 25 anti-telescoping plates; 40 ft. of 24-in. rattan seat covering and 50 G.E. 80 brush-holders have been ordered by the United Electric Railways, Providence, R. I. The Washington Railway & Electric Company has ordered 120 30-in. steel wheels. Kansas City, Clay County & St. Joseph Railway has remodeled all cars on its ten limited trains between Kansas City and St. Joseph.

United Electric Railways has ordered eleven twin coaches from the Twin Coach Corporation, and the Washington Railway & Electric Company contemplates the order of four type Z 29-passenger coaches from the General Motors Truck Company. Pittsburgh Motor Coach Company contemplates the purchase of three buses. An ordinance has been passed authorizing the Municipal Belt Line, Tacoma, Wash., to purchase two new buses. Key System Transit Company has received twenty urban type twin coaches.

The Philadelphia Rapid Transit Company, Philadelphia, Pa., plans a car

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repair shop to cost approximately $70,000.

A third converter station to cost approximately $75,000 is planned by the Knoxville Power & Light Company, Knoxville, Tenn. This will be an automatic substation to provide power to the street car system. The Connecticut Company is installing substation equipment in Hartford, which includes a 33,000-kw. converter. The Milwaukee Electric Railway & Light Company is making an addition to its Thirty-second Street substation. The Dominion Power & Transmission Company is constructing a substation to house a mercury arc rectifier. United Electric Railways has ordered 30,000 S.M. bricks.

$5,000,000 Boston Elevated Extension Proposed

A bill to permit the Boston Elevated Railway to use the New Haven Railroad tracks from the present elevated terminal at Forest Hills, to one at Spring Street has been filed in the office of the House clerk by Representative George A. Gilman of Boston.

The plan is similar to that under which the Shawmut branch was taken over for the use of the elevated to Dorchester.

The passage of the proposed bill, Representative Gilman declares, would provide additional transportation facilities for Roslindale and West Roxbury. The total cost of the project would be approximately $5,000,000.

May Start St. Louis Terminal in 90 Days

If the Interstate Commerce Commission and the Missouri Public Service Commission give their approval construction of the Illinois Terminal System's $5,000,000 terminal development in St. Louis, Mo., will be started within the next three months, according to James A. Hooke, consulting engineer for the company. Final construction plans are now being prepared by Mr. Hooke's office and it is probable actual construction work will be started about Jan. 1.

The terminal company filed an application with the Interstate Commissioners on Sept. 25 for permission to proceed with the improvements, which will include an elevated and subway line connecting the McKinley Bridge with a new underground passenger and freight terminal at Twelfth Boulevard and Lucas Avenue. The company will also build a new freight building and convert a large commercial building at Twelfth and Washington Boulevards into a modern passenger depot.

Fall Rail Buying Starts

The customary fall rail buying movement has started, and the large amount of business on hand and still coming, has caused a number of steel mills to stiffen their attitude on prices. Increased production is noted throughout the steel industry, some districts reaching as high as 85 per cent of ingot capacity.

A number of steam railroads have recently given orders, mostly for winter rolling, for 155,500 tons of rail. In addition, the New York Central Railroad and the Pennsylvania Railroad are each expected to soon be in the market for approximately 200,000 tons of rail.

Hearing on Oregon Line

Hearing of the application of the Portland Electric Power Company, Portland, Ore., for permission to construct a railroad between Albany and Lebanon, has been set for Oct. 13 in Portland. The hearing will be conducted by representatives of the Interstate Commerce Commission.

$1,000,000 Aurora Terminal to Start

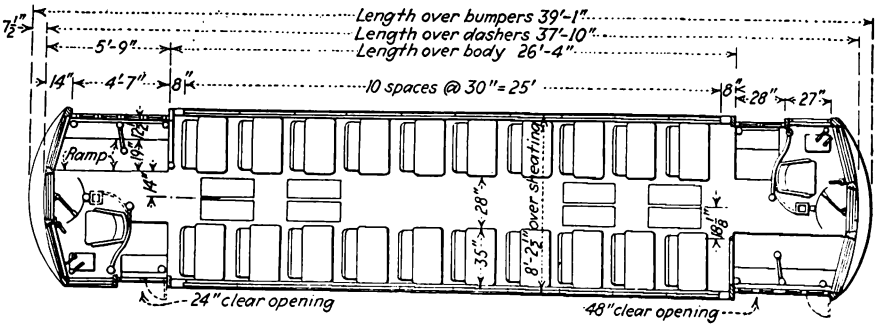
The Chicago, Aurora & Elgin Railroad has completed negotiations for the purchase of river front property in Aurora, Ill., from the American Well Works. This completes the final step in the $400,000 track replacement program of the traction line necessary to the opening of the new terminal at New York Street and the river in Aurora. Work upon the project will begin at once, Col. Edward C. Blair, general manager of the railroad traction line, has announced. Retaining wall-dredging operations and track work will cost about $400,000 and the terminal building construction, which will be several stories high, will bring the total cost of the undertaking to $1,000,000, it is estimated.

Eighteen One-Man Cars for Phoenix

Eighteen one-man, two-man, double-truck, double-end, 40-passenger, motor cars have been ordered by the Street Railway Department of the city of Phoenix, Ariz., from the American Car Company, St. Louis, Mo. These cars are 39 ft. 1 in. long over the bumpers, the width is 8 ft. 5 in., and the height from rail to trolley base is 11 ft. The truck centers are spaced 16 ft. 10 in., the wheels being of 26 in. diameter on a truck wheelbase of 5 ft. 1½ in.

In the body construction the side sill angles are one continuous length and the dasher angles are joined to the side sill angles with gusset plates riveted. The side rest angles and window rest angles are machine fitted to the post and riveted. The cross sills are joined to the side sills and dasher with gusset plates riveted, while the crown pieces are bolted to the sills. The corner post tees are extended in one continuous piece from side sill to side sill, and joined to same with angle iron riveted and fastened to oak posts and head pieces with screws.

The vestibules are of the removable type and have folding doors on the right hand side of both ends which open 48 in. in the clear. Folding doors on the left-hand side of both ends open 24 in. in the clear. All doors and steps are operated by air. The call for bids on these cars was mentioned in the Aug. 11 issue of the JOURNAL.



The Phoenix cars have a seating capacity of 40 passengers

Total weight	30,000 lb.
Bolster centers	16 ft. 10 in.
Length over all	39 ft. 1 in.
Length over body posts	26 ft. 4 in.
Truck wheelbase	5 ft. 1½ in.
Width over all	8 ft. 5 in.
Height, rail to trolley base	11 ft.
Window post spacing	30 in.
Body	Semi-steel
Air brakes	Westinghouse
Axles	Brill
Car signal system	National Pneumatic
Compressors	Westinghouse
Conduit	Flexible
Control	General Electric
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	American Car National Pneumatic engine
Doors	Folding end
Fare boxes	Johnson Fare Box Company
Floor covering	Rubber mat in aisle
Glass plate	D. S. A.
Hand brakes	American Car Company's drop type
Headlights	Ohio Brass Company
Headlining	Haskelite
Interior trim	Mahogany
Journal bearings	Plain
Journal boxes	Brill
Lamp fixtures	General Electric short circuit type
Motors	Four General Electric, inside hung
Painting scheme	Orange and ivory paint
Roof type	Arch
Roof material	F. & G. boards
Safety car devices	Safety Car Devices Company
Sash fixtures	American Car Company
Seats	Brill 201-E
Seat spacing	30 in.
Seating material	Rattan and leather
Steps	Folding
Step treads	Feralun
Trolley catchers	Ohio Brass
Trolley base	Ohio Brass
Trolley wheels	Ohio Brass
Trucks	J. G. Brill Company 177-E-1-X
Wheels, type	Steel, diameter 26 in.
Wheelguards or fenders	American Car Company

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New Railway Projected in Texas

Construction of an electric railway from Point Isabel, site of the proposed valley harbor, to San Benito, Tex., and electrification of the present railroad from Point Isabel to Brownsville is expected to be started soon by the Port Isabel Transportation Company. This company has been granted a charter and expects to begin soon on the electrification project. The tramway is to handle freight and passengers. Traffic from the west end of the lower Rio Grande Valley will be handled through San Benito. C. R. Tyrrell, Brownsville, is president of the railway.

F. R. Fishback, Vice-President of Electrical Manufacturers

F. R. Fishback, president of the Electric Controller & Manufacturing Company, Cleveland, Ohio, has just been elected vice-president in charge of the apparatus division of the National Electrical Manufacturers' Association. Mr. Fishback was elected at a meeting of the executive committee of the board of governors and replaces N. A. Wolcott, resigned.

Mr. Fishback's business experience with the Electric Controller & Manufacturing Company has been on the commercial side. He has held the position of sales manager and in 1924 was appointed vice-president and secretary. The following year he was elected president, which position he now holds.

As vice-president of the apparatus division of N.E.M.A., Mr. Fishback will represent a group which includes about 85 per cent of all the manufacturers of electrical apparatus and machinery in the country.

Pipe Unions Standard Approved

Approval of a proposed commercial standard for malleable iron or steel screwed unions for use with standard weight pipe, was given Sept. 24, 1928, by a general conference of interested elements of the industry. This conference was held under the auspices of the commercial standards unit of the Bureau of Standards, Department of Commerce. This commercial standard pertains to black and galvanized types of brass-seated malleable iron or steel unions.

Auto Parts Associations Unite

Completion of the merger of the Motor and Accessory Manufacturers' Association and the Automotive Equipment Association was announced recently following a ratification meeting of members of the former body. The consolidated organization has been named the Motor and Equipment Association.

Members of the new body number more than 800, including manufacturers of virtually all automotive products except complete vehicles, and wholesalers of the various equipment lines.

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

	Oct. 2, 1928
Metals—New York	
Copper electrolytic, cents per lb.	15.025
Copper wire, cents per lb.	17.125
Lead, cents per lb.	6.5
Zinc, cents per lb.	6 60
Tin, Straits, cents per lb.	49.625
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.40
Somerset mine run, f.o.b. mines, net tons	1.90
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1 50
Central, Ill., screenings, Chicago, net tons	1.175
Kansas screenings, Kansas City, net tons	1 75
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.3
Weatherproof wire base, N.Y., cents per lb.	17.625
Cement, Chicago net prices, without bags	2.50
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.4
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal	$0.585

M. L. Heminway, general manager of the Motor and Accessory Manufacturers' Association for approximately ten years, is managing director of the new association. B. W. Ruark commissioner of the Automotive Equipment Association, is assistant managing director.

Detroit Rejects Car Bids

The bids of five companies on 100 new street cars for the Detroit Street Railway, Detroit, Mich., were turned down by the commission. The commission then ordered Joseph E. Mills, commissioner of purchases and supplies, to readvertise for bids.

Illinois Terminal Railroad Improvements

The Illinois Terminal Railroad System, Springfield, Ill., is building a large freight car repair yard along its lines 4 miles south of Edwardsville, Ill., where damaged freight cars will be rebuilt. This company is also completing a 14-mile extension from Troy Junction to a point near O'Fallon, Ill. Company officials are also considering extending the line southward to East Carondelet, Ill.

TRADE NOTES

Ideal Commutator Dresser Company, Sycamore, Ill., is now represented in the New England territory by Albert E. Mace Company, Inc., 93-97 Heath St., Boston, Mass., for the sale of ideal commutator and motor maintenance products.

International Oxygen Company, Newark, N. J., has taken over the business of the Tariffville Oxygen & Chemical Company, Tariffville, Conn. This plant will be conducted by the newly formed Tariffville Oxygen Company as the New England division of the International Oxygen Company.

Bassic Manufacturing Company, 2650 North Crawford Avenue, Chicago, Ill., has changed its name to Alemite Manufacturing Corporation. The address remains the same.

Linde Air Products Company, New York, N. Y., has opened a new plant in Akron, Ohio, to produce oxygen. This plant will be operated under the direction of A. Deagon, superintendent.

Atlas Conveyor Company, Philadelphia, Pa., announces that A. J. Forschner, who joined the company in July as vice-president, has also taken over the duties of secretary for the company. E. A. Thumlert, formerly employed in this capacity, is no longer connected with the company.

Ralph K. Weber was elected president of the Mount Vernon Car Manufacturing Company, Mount Vernon, Ill., Sept. 24. He succeeds W. C. Arthurs, deceased. Mr. Weber had been vice-president of the company for twenty years and has a wide acquaintance among railroad executives throughout the country.

Lincoln Electric Company, Cleveland, Ohio, announces the opening of a San Francisco office at 533 Market Street in charge of W. S. Stewart. L. P. Henderson, formerly of the Chicago office, has been transferred and put in charge of the Minneapolis district. Robert Notvest has been transferred from Kansas City to Indianapolis where he will have charge of the Indianapolis district, and R. E. Mason has been sent to Kansas City. N. L. Nye has been stationed at Akron, Ohio, under the direction of R. P. Tarbell, manager of the Cleveland district.

P. A. Terrell, formerly manager of the new industries division of the Mississippi Power Company, has taken charge of central stations and railroad sales for the Copperweld Steel Company, Chicago, Ill. Mr. Terrell's appointment brings to the states of Tennessee, Mississippi, Alabama, Georgia and Florida the Copperweld engineering service on such problems as sag, tension, etc.

ADVERTISING LITERATURE

Nichols-Lintern Company, Cleveland, Ohio, has recently issued a 40-page booklet containing a complete description of the 22 types of N-L universal signal lanterns, together with lantern flasher controls and reflector units for steel mill, factory and highway use. The booklet also contains a detailed description of the lintern electro-magnetic sander for overhead cranes, and N-L mechanical sanders for locomotive cranes.

General Electric Company, Schenectady, N. Y., has issued bulletin GEA-990 descriptive of type E Form L emergency valve for straight air brake equipment with emergency feature. Aside from a description the bulletin contains several cross-section drawings.

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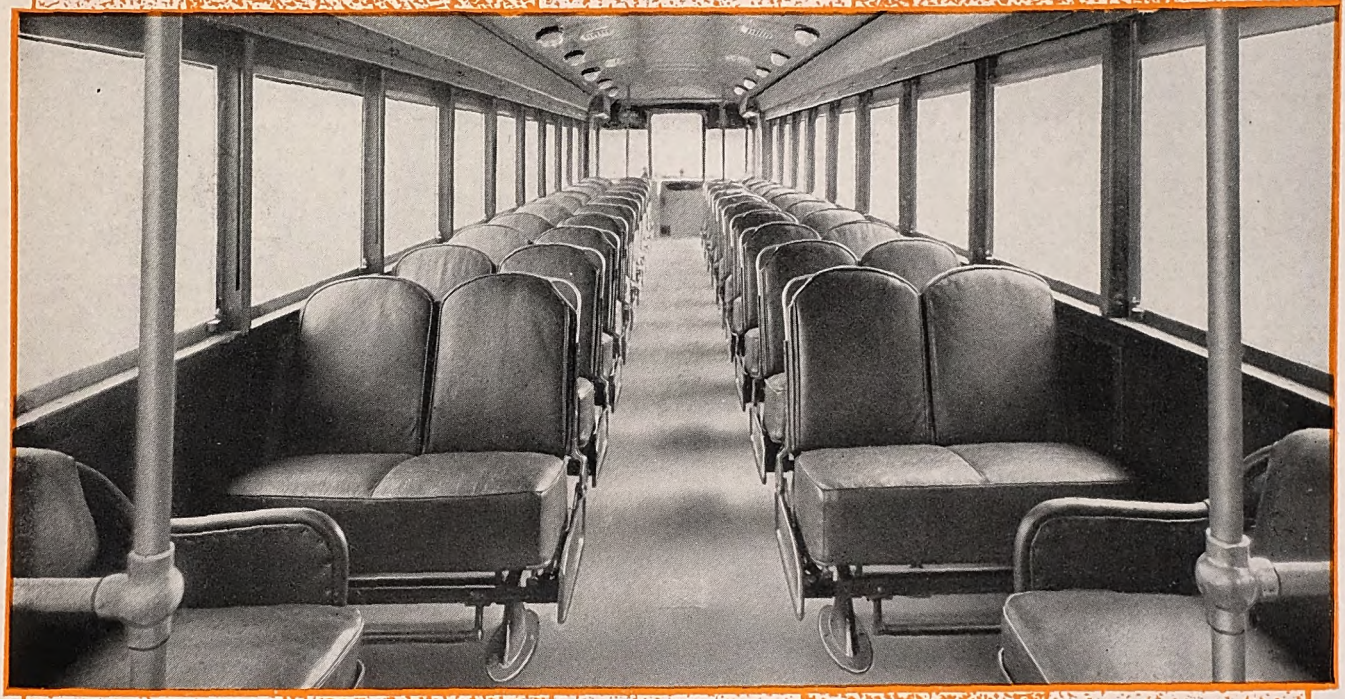

Pioneers in Progress

The ten new cars built by The G. C. Kuhlman Car Company for the Monongahela-West Penn Public Service Company are the first cars of their type to be placed in regular service in the United States. Close cooperation between operator and manufacturer has resulted in a type of design that is particularly pleasing.

Wide side windows and the latest Brill type of leather upholstered seats add to the inviting appearance of the interior. The Brill 177-EX-1 Trucks under these cars are equipped with W-N double reduction type drive, the motors being entirely spring supported on the truck frames. Here, then, is an engineering accomplishment based upon proven principles of construction with the added advantage of new and pleasing design.

Write for the complete story of these new cars.
It is worthy of your earnest consideration.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO — WASON MANF'G CO. SPRINGFIELD, MASS.

BRILL MODERN CARS

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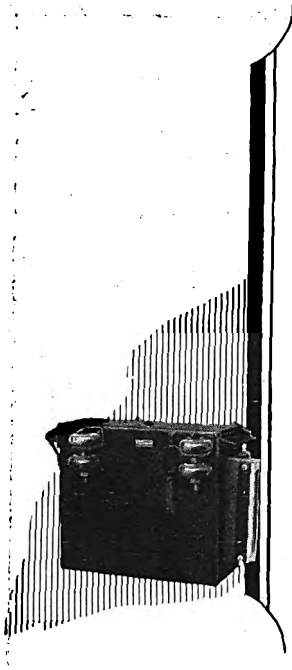
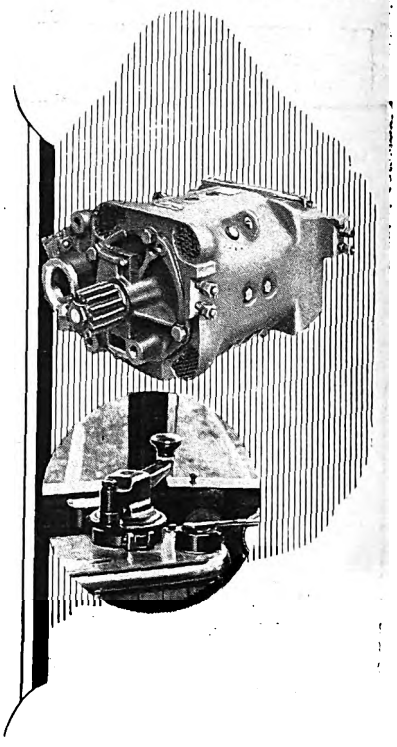


for one road

276 G-E-275 motors

139 L B Control handles

69 D B Line breakers



A Real Testimonial

By adding the motors and control listed above, the United Railways and Electric Company, of Baltimore, has demonstrated its confidence in G-E modern car equipment—a confidence based on years of dependable service.

This is only one of many instances in which GE-275 motors and G-E control equipment have been installed in large numbers and have made a reputation for reliable and economical operation. Other extensive users, such as Philadelphia, Chicago, and New York State Railways, have had similar experience.

LB Control Handles and G-E light-weight Line Breakers are now in use on over 75 railway properties.

The railway specialist in your nearest G-E office will explain the advantages of this and other G-E railway equipment.

General Electric co-ordinates the production of railway electric equipment of all kinds with the manufacture of apparatus necessary for its efficient and economical maintenance. By specifying "G-E" you profit by the experience gained in solving electric railway problems for more than thirty years.

330-48

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

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ELECTRIC RAILWAY JOURNAL

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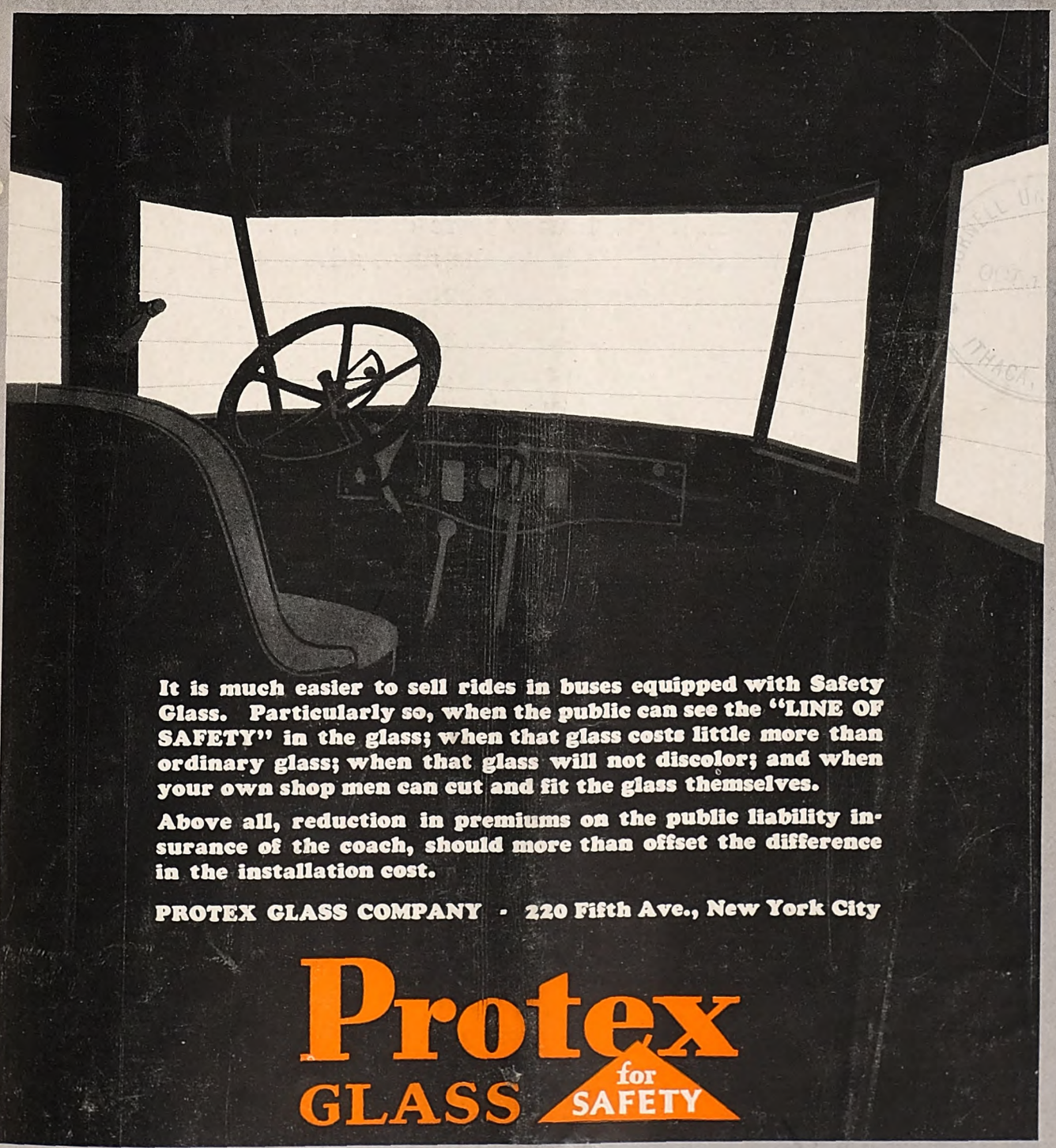

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The Keynote of the Convention

"THAT new, comfortable, speedy street cars are an immediate need to attract regular patronage," echoes a major keynote of the recent annual convention of the electric railway industry.

Car and equipment manufacturers this year exhibited complete new models which will increase gross receipts when operated in the service for which they were designed, because they conform to the most advanced public taste in transportation.

Westinghouse leadership in the design and manufacture of electrical apparatus consistent with the trend in car and coach development is again emphasized by the fact that two-thirds of the models shown in Cleveland were equipped with Westinghouse motors and control.

Send for a copy of Cars and Car Equipment, S. P. 1816, containing details on twenty new recent models placed in successful operation.

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of Street Railway Journal and Electric Railway Review
CHARLES GORDON, *Editor*

LOUIS F. STOLL,
General Manager

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Transportation Association Offers Many Definite Service Improvements

IF ONE thing more than another stood out through the sessions of the American Electric Railway Transportation and Traffic Association it was the opinion of all who attended of the need for speed, comfort and safety in the betterment of service. The reiteration of that need took precedence over all other subjects. Not for one moment, however, was sight lost of the fact that the necessary element in procuring this result is the creation of the proper spirit on the part of every employee. Since practically all committee reports and discussions at the convention centered on these three factors in improved service, many valuable ideas were brought out.

Common sense seems to be asserting itself in the consideration of traffic relief measures. There the trend is toward more practicable and reasonable methods. Transportation men can be charged with fostering the idea of the elimination and regulation of parking, the encouragement of commercial loading spaces and the establishment of adequate by-pass routes, but it was especially significant that the impracticable advocate of three-deck streets, moving sidewalks and other out-of-the-question relief measures did not expose himself to the withering shell fire of the man who inquires into these things on the basis of both their expediency and their cost. Of course, speed with safety can be secured easily if the element of cost can be ignored entirely, but since it can not, the opinion of the majority was that the greatest factor opposed to speed in congested districts is the parking of automobiles, fostered by downtown merchants, who must be shown how parking really decreases their business and causes decentralization of shopping areas.

The report of the committee on service betterment, an excellent presentation, discussed freely, dealt principally with methods of saving time and increasing the speed of operation. Here indeed was a wealth of suggestions. There can be no question but that the sources of time saving are to be found in scientifically located passenger stops, increased frequency of service, better spacing methods, adequate traffic regulation, careful fare collection, superior equipment and instruction of trainmen, on all of which the report dwelt. Recommended for increasing the speed of cars were the elimination of unnecessary stops and the re-location of others, the skip-stop plan, the staggered skip-stop, the installation of loading zones, express street cars with local bus operation, express bus and local street car operation, the adoption of one-way streets, elimination of left turns and the restriction of heavy loading on congested streets to certain hours of day or night. Speed can be increased and time saved only as the possibilities of each and every one of these things are exhausted.

Though the report of the committee on service betterment evoked much interest, it was typical of the others, all of which represented much hard work and study. The Transportation and Traffic Association is to be commended for the progress it has made during a period when congestion and accident hazards have increased enormously. It is to be hoped that many managers will adopt for their systems the practices recommended, since these improvements are all within the range of minor modifications in methods involving relatively little capital outlay. Only in so far as these suggestions are generally applied will the excellent work of the Transportation and Traffic Association during the past year prove not to have been in vain.

A Good Example is the Best Sermon

FOR the past six years the Coffin prize has been the highest honor each year, the *magna cum laude,* in the electric railway industry. The selection is limited, it is true, to those companies which enter the contest and submit specified data from which relative performance can be judged, but this does not detract in any way from the importance of the award. Such limitation is necessary in every contest for which a prize is offered, and the number of contestants for the Coffin award each year has been sufficient to make the competition a very real one.

The obvious purpose of any such award is twofold. One is to give proper recognition to distinguished merit and services in the field. The other is to encourage other properties to make similar effort toward excellence. Both results have followed in the electric railway field, where the effect has been notably wholesome. It has helped many companies struggling with adverse conditions to realize that success is possible, even on small properties. It has shown them concretely what practices to follow, and it has silenced the croakers and crêpe-hangers, who see nothing ahead for street railways but lingering death and disaster. There is still another benefit from such a contest not often emphasized or even realized, yet it is none the less real. Every contestant participates in it, whether he wins the prize or not. This is the benefit gained by any organization which puts itself through a self-examination as to the results of its own work. If such an analysis is at all thorough, it is bound to disclose the weak as well as the strong points in the undertaking and so result in higher efficiency. It is notable in this connection that since 1923 when the first prize was offered two of the winners have been Stone & Webster companies, indicating that this organization, at least, thinks participation in the contest worth while.

The story of the Virginia Electric & Power Company, the winner this year, is particularly interesting because it operates in four cities of less than 200,000 population, that is to say, it belongs to a class of which there are a great many in this country. It is also worthy of note that the company has no hard and fast rules to apply to all

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of its four properties. As well might a doctor prescribe the same medicine to all his patients. In the Virginia case, the operating methods, fares, etc., vary to a considerable extent with the local conditions in each city. All of these points, with the practice employed, are set forth briefly in articles in last week's and this issue, with two more articles to follow.

A feature of these accounts is the graphical analyses with which several are accompanied. These graphs permit the high points in the story of the company for the last four or five years to be read at a glance. For companies in cities of about the size of Richmond, Norfolk, Portsmouth and Petersburg, these articles should prove very helpful. As an old proverb says: "A good example is the best sermon." With this example, other companies, similarly situated, need not despair of ultimate success.

Speed—Without Sacrifice of Safety

EXCELLENT progress has been made toward increasing the safety of the street car as a means of transportation, but little has been done toward increasing the speed of the cars, even though this is one of the most important objectives in any program of service betterment. It may seem to some that the one result must necessarily have been attained at the expense of the other. Where schedule speeds have not been reduced it may be held that much has been gained through the elimination of parking and better regulation of street traffic, thus offsetting a studied overcaution which has set up a mental barrier against faster movement.

Schedule speeds of street cars and other vehicles as well are governed by three distinct factors: maximum speed that can be attained, rates of acceleration and retardation, and standing time. The first two of these factors are to some extent inherent in the design of the vehicle, while the third is largely under the control of the operator and of the traffic signals. However, it is possible to do much toward elimination of waste time with no increase whatever in the accident hazard. Then, too, many operators do not get the most that they can out of the mechanical equipment which they are controlling, even though at the moment there is no possibility of danger. Neither acceleration nor retardation in the average city is as fast as that for which the devices involved were designed.

Before much can be done toward an improvement in speed the car operators must be assured that their mechanical equipment will function as it should. Even though not of the latest pattern, the devices should be maintained to a standard worthy of the confidence of the men. The operator is entitled to know that brakes are so effective that they will stop the car within the prescribed distance, that switches will remain placed when once set, that block signals are dependable and that sanding devices will function. With his mind assured on such points he will feel able to take advantage of every possible opportunity to move his car over the road, and have the assurance that it can be done without subordinating the accepted precepts of careful operation. Besides this, the operator should have the advantage of careful training so that he will know whether or not he is taking full advantage of the possibilities for saving every second and utilizing every break in traffic to move his car.

Thus the responsibility for higher speed comes back to the management in practically every instance. It does little good to preach about the need for faster service if the individual is not told as to how he can obtain it. This requires organization such that not only will the equipment of the system be in mechanically good condition, but such that the supervisory forces and the men will have the spirit and the will to do what is necessary to move the cars on a fast schedule without sacrifice of safety.

Streets Were Made for Moving Traffic

IN URGING the enactment and then the enforcement of the parking ordinance before the City Council of Philadelphia, the *Ledger* says that it is too much to hope that any lasting remedy for the parking evil will come through voluntary action. This is also the opinion of Mayor Mackey, who insists that the ordinance shall be passed. Advocates of the measure show no disposition not to give full credit for the effect which the parking areas established by the Philadelphia Rapid Transit Company and others outside of the business district have exerted as a measure of relief, but they are convinced that such arrangements alone will not bring about a solution of the problem.

It would seem that congestion must in the end be self-correcting, but while this idea is good as a theory, it does not work out practically, since the traffic jams of the private vehicles inflict their penalties alike on the private user and the user of the public transportation service who in the aggregate has rights paramount to those of the individual.

One of the things advocated at Cleveland as an end toward the solution of the problem, namely, co-ordination of public transportation agencies, has been carried out on a scale probably more nearly complete in Philadelphia than in any other city in the United States, yet that alone is not the answer. There the local railway management has played its part and played it well by co-operating in the effort to reduce congestion, particularly by so distributing the taxis which it operates as to reduce to a minimum the number of cruising vehicles. But any good that might have come out of such efforts has been negatived since the street space so saved has been quickly appropriated by others.

Not because railway men made the statements, but because they are sound, the note of warning contained in the report of the committee on service betterment presented at Cleveland is of great interest in this connection. Streets were made for moving traffic. Their use for storage purposes should be allowed only when such use does not interfere with traffic. These things are irrefutable. Their acknowledgment is merely a matter of time, irrespective of any question of political or personal expediency.

The entering wedge in the restriction of the private car to the purpose for which it was originally intended has been most effectively driven. At this stage of the matter, however, it may seem like fustian to say so, but it is only a question of time when adequate relief will be secured by legislation, which, among other things, will eliminate parking on heavily-travelled streets during the peak traffic movement and undoubtedly prohibit parking entirely throughout the day on the busiest thoroughfares. Of course the millenium in traffic regulation is not at hand, nor is it likely soon to dawn, but the notable work in this direction already done in Chicago, Philadelphia and other cities and the instance presented in the case of Mayor Mackey do hold out hopes that rapid progress toward congestion relief may be expected in the near future.

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Training Essential to Teamwork

TRAINMEN, mindful of the possibilities of their jobs, alert to the industry's necessities, and willing and able to co-operate with the management, represent the greatest operating asset that any electric railway can possess. With the advent of the automobile, there has come about a greater appreciation of the importance of the part played by the individual trainman in his relations with those who use public transportation service. He not only must be courteous, but he also must give efficient and reliable service, obtain the greatest possible speed and be ever alert to prevent accidents. He is also the direct representative of the company and in this capacity wields a powerful influence upon the attitude of passengers toward the railway. Unquestionably, the platform man has the biggest opportunity of any other member of the company in improving the attitude of the public toward the railway.

Contact between employees and customers affords the best medium for disseminating information to the public and, likewise, the most logical way of receiving complaints and suggestions from patrons. Unsatisfactory public relations are most always caused by neglecting to give the public information to which it is entitled. Although newspaper advertisements, car cards and other publicity means are effective and necessary, the man on the platform offers the best medium of approach because personal contact is the most powerful of all factors for influencing opinion.

A proper mental attitude on the part of the employee himself is recognized as the first requirement in developing satisfactory relations with the public. To achieve this, the employee should be acquainted with all facts about his company. He should be drilled in the proper methods of handling various situations that arise on a car platform and should be brought to understand that a friendly public improves the conditions under which he works and helps to make his job more desirable. Thus, in the increased attention that is being given today to the question of employee-customer contact there is the promise not only of improving the situation of the company, but of raising the standards and bettering the working conditions of the man himself.

Brady Safety Contest Extended

IF SAFETY were merely a preachment among the electric railways the excuse for their seeming indifference to the Brady safety contest would not be far to seek. But safety is not merely a preachment among the companies. Its intensive practice is a fact. Of this there is evidence on every hand, but particularly in the presentations of the Coffin award contestants. True, the Brady award was re-established only last year, but the disposition of the companies not to compete for the honors in larger numbers may be due more to their not having appraised the value of the award correctly than to any other reason. In this connection it should be remembered that the Brady award by its very nature does not impose the necessity for the preparation of any elaborate brief. The presentation is more a matter of the compilation of the record of accomplishments. The award ought to be highly coveted. Since the electric railways take first rank among the industries for their safety work it behooves them to spread their stories on the record. It is to be hoped that the mere reiteration of the fact that under the extension of time recently arranged they have until Nov. 1 to make their presentation will serve to bring in additional contestants. There is no company that can afford to regard lightly the prospect of its being successful in winning the Brady medal.

Buffalo Acts in Bad Faith Toward Its Railway

JUST as it is beginning to see the light of day, the International Railway, Buffalo, finds itself confronted with one of the worst cases of breach of faith on the part of city representatives that is on record. In the last few years stockholders have poured more than $4,000,000 into the property during a period in which car riders were carried at less than cost. Finally came a measure of fare relief, but meanwhile under an understanding with the city in the matter of street improvement the company accepted a huge burden as part of the whole plan to re-establish the railway on a sound basis. Briefly, this program called for the expenditure of $250,000 in reconstruction work during 1927, and a similar program to cost $375,000 in 1928. These amounts were in excess of the additional earnings of the company under the revised rate of three tokens for 25 cents, with a 10-cent cash fare, effective July 1, 1927.

It was never asked or expected that the company should spend all the additional revenue to be derived from the increased fare for reconstruction of tracks and paving, yet the company has devoted all that sum and more to that purpose. The streets in which this money was to be spent were selected co-operatively in a joint conference of city and company officials. Despite this, the Council ordered the commissioner of public works to sign contracts for additional paving at a cost of $102,000, to be collected from the railway. Including track reconstruction in the areas affected, the total cost of the work will be more than $300,000. The Council rejected the suggestion of the railway company that co-operation be continued.

Last August President Yungbluth issued a frank and business-like reminder of the fact that the company is financially unable to undertake any work in addition to the large amount being done this year, and that if the city continued to demand that the company pay for more work after all the work the railway can afford has been done, it was acting unfairly and the only course open to the company was to take immediate action to obtain the additional money required. This letter from the president was not intended as a refusal to do the additional work demanded by the city. Neither was it intended as a threat that the company would seek a higher fare. The company is prepared to do the additional work, but it cannot do it on the basis of its present revenues. There can be no question about that. In consequence the responsibility for the plea of the company for a straight 10-cent fare rests squarely upon the city. No other alternative was open to the company.

Since the city has insisted upon carrying out work not included in the original program, the cost of which would even have exceeded the return from rates as at present in force, the company has done well by its frank statement to fix the responsibility where it rightly belongs—on the city. It is to be hoped that a way out of the matter will be found, but if the city officials remain obdurate, then the people of Buffalo will have only their accredited political representatives to blame if they are called upon to shoulder the additional burden of an increase in fares.

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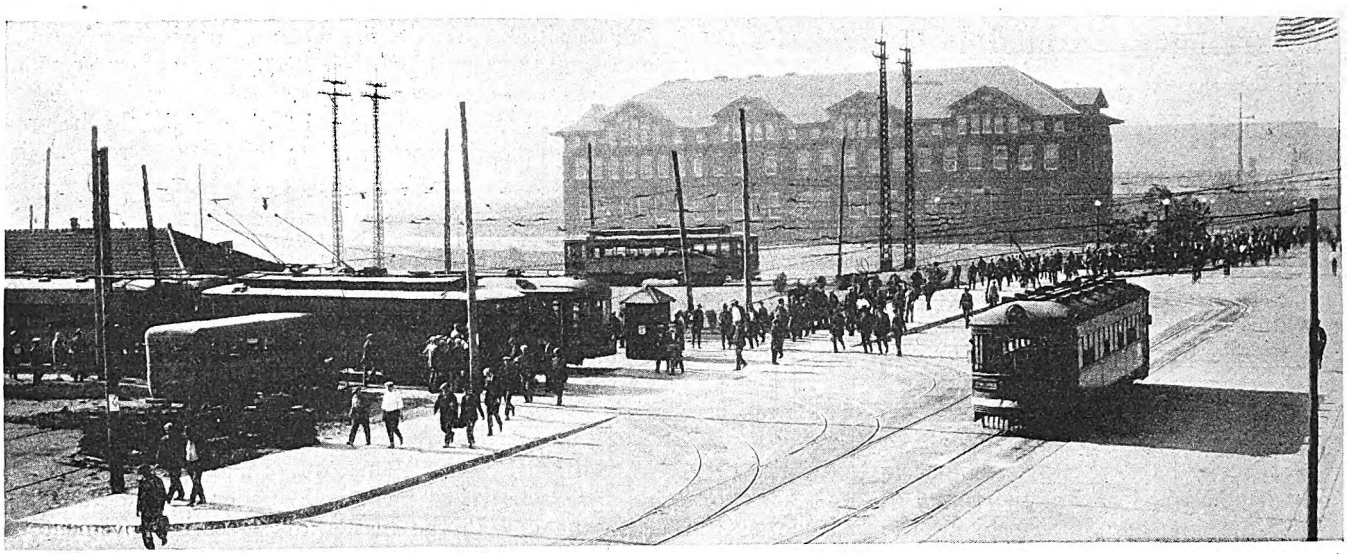


The Gary Railways has proved the practicability of one-man car operation in peak-load service. At the time of changes of shift at the steel mills, the railway sometimes has to carry 15,000 passengers

New Equipment Increases Riding

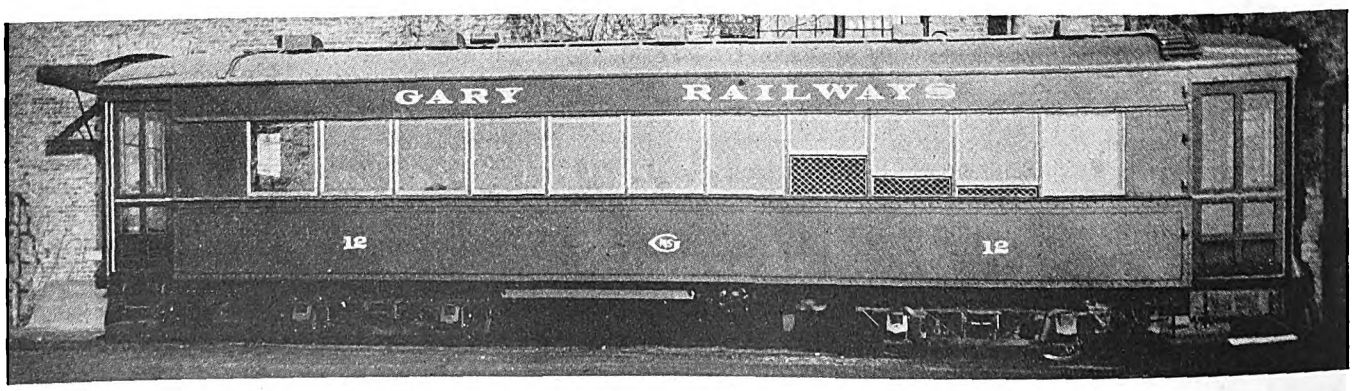
Gary Railways finds new cars and shorter headway bring increase in revenue. Adopts novel method of advertising the improvements in service introduced. Ingenious mechanical and electrical kinks

SINCE the present management of the Gary Railways has had charge of the property, or since 1918, there has been a continuous improvement in the type of rolling stock operated and a corresponding increase in the earnings of the company. This railway system now comprises 73 miles of street and interurban railway, with 22 miles of motor coach routes. The latter serve as feeders to the street and interurban railway lines. The principal city business done is in the city of Gary, Ind., with its population of 110,000 people. They are spread over an area equivalent to that of the city of Indianapolis but with only one-fourth of that city's population. Some particulars of the practice of the company, taken from its 1928 Coffin prize brief, follow:

During the five years from 1923 to 1927 the company expended $2,500,000 for physical improvements, additional equipment and extensions. It has now 100 per cent one-man operation, and these cars are found to be able to handle successfully peak loads of the severest intensity, such as occur in an industrial center as Gary. During the past five years the company has laid a great deal of track with steel ties, 90-lb. rails, concrete pavement and sub-structure and thermit-welded joints.

Largely because of these improvements, it has been able to reduce its operating expenses per car-mile during the past two years from 34.1 cent in 1925 to 29.8 cent in 1927. During the last three months of 1927 the operating cost was only 27.4 cent per car-mile. This figure was accomplished in spite of a wage schedule of 78 cents per hour, said to be exceeded by only two companies in the United States.

A conspicuous feature of the rehabilitation of the



Features of these new one-man cars are the drop letterboards, low streamline construction and the attachment of a window screen to the bottom of the sash so that when the window is raised the screen is pulled into position

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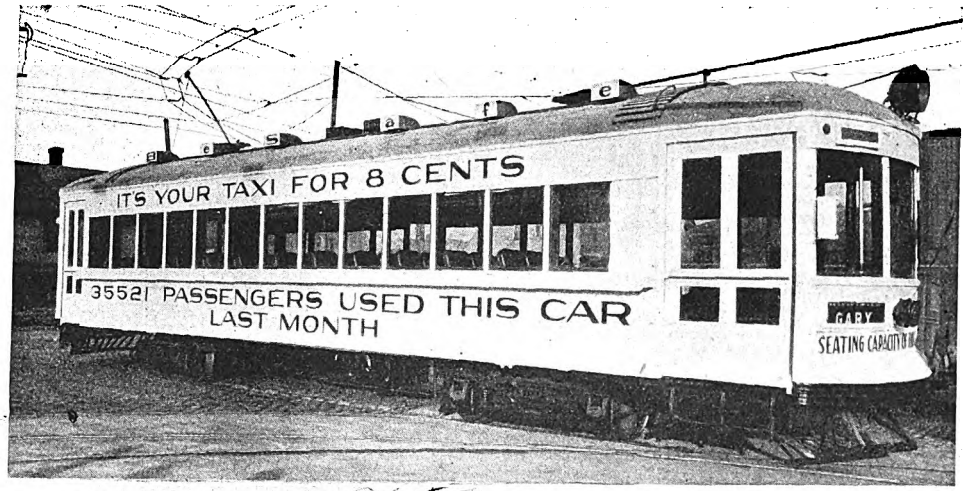
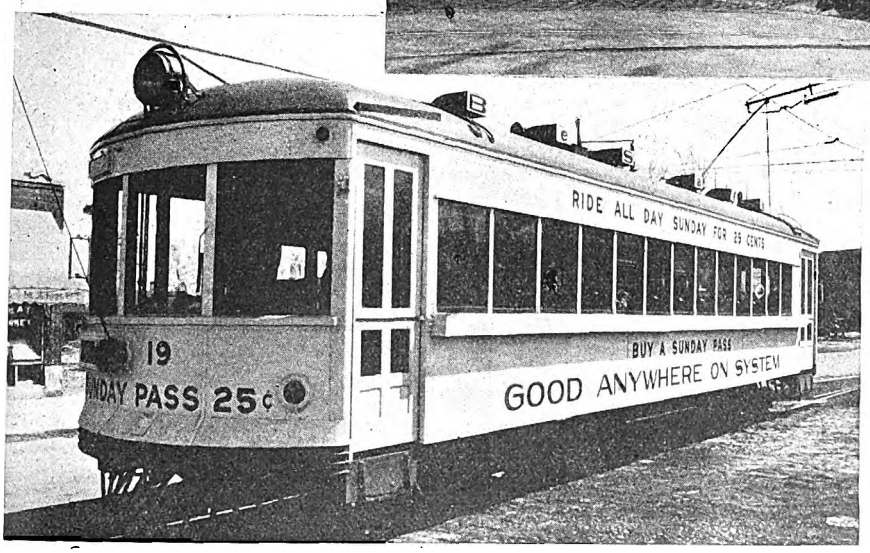
property has been in the rolling stock. Five new double-truck one-man cars were bought in July, 1926, seven in January, 1927, and eleven in July, 1927. In addition, sixteen old center-entrance cars were completely remodeled in the shops of the Cummings Car & Coach Company, making them, in the opinion of the management, almost the equal of new cars.





One car has been painted white and lettered to advertise the service. On such occasions it travels over all of the lines of the system. The car painted in two ways is shown in the accompanying views

Features of the 23 cars purchased in the past two years are their low streamline construction, upholstered seats, linoleum-covered floors, low steps and complete safety equipment. The exterior is painted the standard orange. The seats are individual, upholstered in genuine brown Spanish leather, and the floors are covered with green battleship linoleum.

All the new cars have the drop letterboard which provides a more rigid car frame and less window space to repair and replace. It also results in a car which can be more easily heated in winter, and it simplifies car washing.

Another interesting feature of these cars is a new type of screen which is attached to the bottom of the sash in such a way that when the window is raised this screen is pulled up into position. This improves the appearance of the car as it dispenses with window guards.

Another change made in the cars has been the removal of the whistles from all city cars. It was found by experience that automobilists on the track paid very little attention to the sound of a whistle, and so long as whistles were part of a car's equipment, the motorman used the gong but seldom. When the whistles were removed all gongs were placed in first-class condition, and a close check was made as to results. It was found that the trainmen were more alert and careful than before, and accidents were reduced.

While the subject of accident reduction is being mentioned, the explanation should be made that the company gives a vacation of five days with full pay to all trainmen who have served an entire year without an accident. Last year 70 per cent of the men enjoyed this reward. The percentage has been as high as 83. This vacation is in addition to one given to all employees who have been two or more years with the company. The length of this latter or service vacation is one-half day for every year of service.

The principal changes in the remodeled cars were to redesign them for one-man operation. This meant the removal of the existing folding center doors and the addition of six seats at the center, increasing the seating capacity of each car from 44 to 52. Passenger circulation was promoted by providing rear treadle exits and increased width of the entrance at the front end. The passenger's comfort was cared for with seating and fixtures similar to those on the new cars. If these entirely remodeled cars are considered to date from 1927, the average age of the 100 cars of the company is only 5½ years, as compared with an average age of 7.6 years for the 93 cars owned in 1925.

Mass Transportation Accomplished With One-Man Cars

Reference has been made to the success of the one-man cars in handling heavy peak loads. To adopt such a

In spite of the fact that Gary is a steel mill town, the seats are individual and upholstered in genuine brown Spanish leather, and the floors are covered with linoleum

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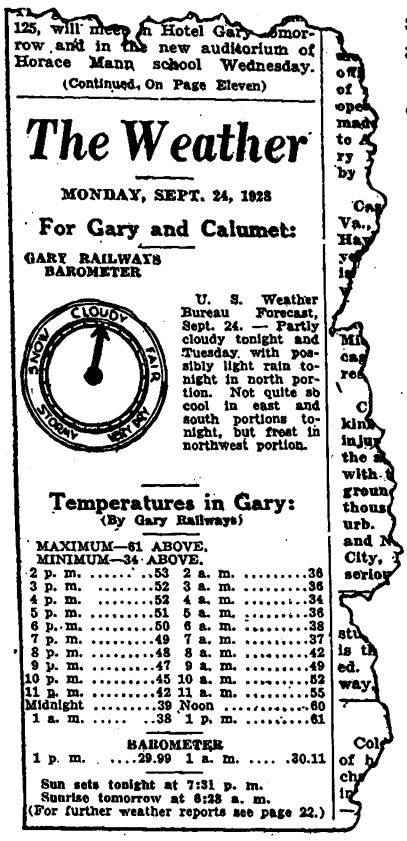


125, will meet in Hotel Gary tomorrow and in the new auditorium of Horace Mann school Wednesday.
(Continued. On Page Eleven)

The Weather

MONDAY, SEPT. 24, 1928

For Gary and Calumet:

GARY RAILWAYS BAROMETER

U. S. Weather Bureau Forecast, Sept. 24. — Partly cloudy tonight and Tuesday with possibly light rain tonight in north portion. Not quite so cool in east and south portions tonight, but frost in northwest portion.

Temperatures in Gary:
(By Gary Railways)

MAXIMUM—61 ABOVE.
MINIMUM—34 ABOVE.

2 p. m.	53	2 a. m.	36
3 p. m.	52	3 a. m.	36
4 p. m.	52	4 a. m.	34
5 p. m.	51	5 a. m.	36
6 p. m.	50	6 a. m.	38
7 p. m.	49	7 a. m.	37
8 p. m.	48	8 a. m.	42
9 p. m.	47	9 a. m.	49
10 p. m.	45	10 a. m.	52
11 p. m.	42	11 a. m.	55
Midnight	39	Noon	60
1 a. m.	38	1 p. m.	61

BAROMETER
1 p. m. ....29.99 1 a. m. 30.11

Sun sets tonight at 7:31 p. m.
Sunrise tomorrow at 6:28 a. m.
(For further weather reports see page 22.)

Gary Railways gives the public the benefit of its weather observations daily, through one of the leading newspapers

step for a railway in an industrial city like Gary was a bold undertaking. During the shift changes at the steel mills, the railway is called upon to transport more than 15,000 workmen. This results in heavy car loading, the average per car being well over 100. The question naturally arose as to whether one-man operation would be too slow under such conditions. Actually, however, it was found that there is no appreciable difference in this respect between the two modes of operation.

Fortunately the company is in a position to testify as to the effect of new rolling stock and reduced headway on traffic. Reduced headway was possible because of the reduction in expenses following one-man operation. Changes in headway were made as follows:

Jan. 6, 1927—Hammond division	30 to 20 minutes
June 25, 1927—Broadway—45th Avenue	15 to 10 minutes
Nov. 25, 1927—Broadway—26th Avenue	5 to 3 minutes
Dec. 26, 1927—Ambridge division	10 to 5 minutes

No change was made in the headway of the cars on the Indian Harbor division.

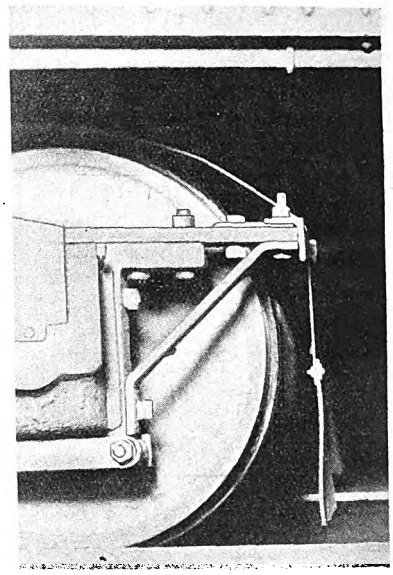
The combined results of reduced headway and new equipment on revenue are shown in the table on page 671.

Increasing and Improving the Service

Of course these results in increased patronage did not come about without some effort to call the attention of the public to the fact that modern cars were being placed in service on various routes. A program of newspaper publicity, both in the news columns and in the advertising columns, was carried out for several weeks preceding the arrival of the cars, as well as following their introduction to the service. During this campaign a car painted white with lettering on it was operated over various routes. One of the expressions used was: "35,325 people used this car last month. It is your taxi for 8 cents."

Since that time the car has been repainted and used to advertise other improvements made by the company, such as the introduction of the Sunday pass for 25 cents. The accompanying pictures of the car in each of these situations tell the story. On such occasions the car travels over all of the lines of the system. It will be retained as an advertising feature of the railway.

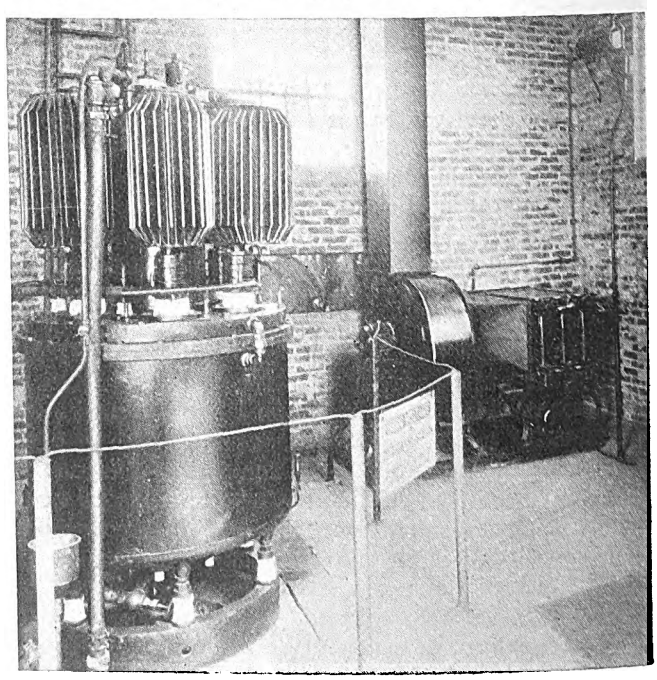
Another novel way by which the company's name and service are kept before the public is through its weather observations. The company, like many other electric railways keeps a regular record of barometer and thermometer readings from self-recording instruments, to help the operating department determine storms in advance. The management found that the newspapers were glad to have these figures and would publish them adjoining the space devoted to government weather bureau forecasts. In consequence, these data appear regularly in each issue of the *Post-Tribune,* with credit to the Gary Railways. A reproduction of a typical forecast is published on this page.



This shield is carried over and in front of the wheels to keep mud from being thrown on the resistance grids

Some time ago it was found that in spite of the usual square sheet-iron guard, which is fastened adjacent to the bank of resistance grids on the car body, dirt and wheel wash would be thrown on these grids. To overcome this trouble the master mechanic of the company developed a wheel guard very similar to an automobile mudguard. It is shown in the illustration above. It consists of a bent piece of light sheet iron, fastened to the car truck and conforming to the curvature of the wheel. It is mounted within 6 in. of the wheel itself. It acts as a very effective shield for mud and water thrown from the wheel.

During 1927 the company installed a 500-kw., 600-volt rectifier on its Gary-Valparaiso division. After this rectifier had been in service practically a month it developed serious trouble with electrolysis of the metal hose fittings of the water cooling system. To meet this situa-



A connection on the rectifier protects the hose connection from electrolysis

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TABLE SHOWING REVENUE BEFORE AND AFTER INTRODUCING MODERN CARS AND SHORTER HEADWAYS, GARY RAILWAYS

Route	Type of Cars	Revenue	Car-Miles	Revenue per Car-Mile, Cents	Period
Broadway-26th Ave.	New	$9,057.28	22,872	39.6	21 days in December, 1927
Broadway-26th Ave.	Old	5,537.99	13,394	41.3	21 days in November, 1927
Broadway-26th Ave.	Old	8,353.74	17,367	48.0	21 days in December, 1926
Broadway-26th Ave.	Old	8,613.65	17,373	49.5	21 days in November, 1926
Ambridge	New	795.88	2,313	34.4	7 days, Dec. 16–22, 1927
Ambridge	Old	429.92	1,313	32.7	7 days, Dec. 9–15, 1927
Indian Harbor	New	2,972.96	9,954	29.9	14 days, Aug. 1–14, 1926
Indian Harbor	Old	2,663.65	9,954	26.8	14 days, July 1–14, 1926
Broadway-45th	New	55,841.69	103,500	54.0	90 days, June 25-Sept. 22, 1927
Broadway-45th	Old	53,516.89	91,371	58.6	90 days, March 25-June 24, 1927
Hammond	New	8,978.90	22,033	40.6	14 days, Jan. 9–22, 1927
Hammond	Old	8,335.59	15,632	53.0	14 days, Dec. 9–22, 1926

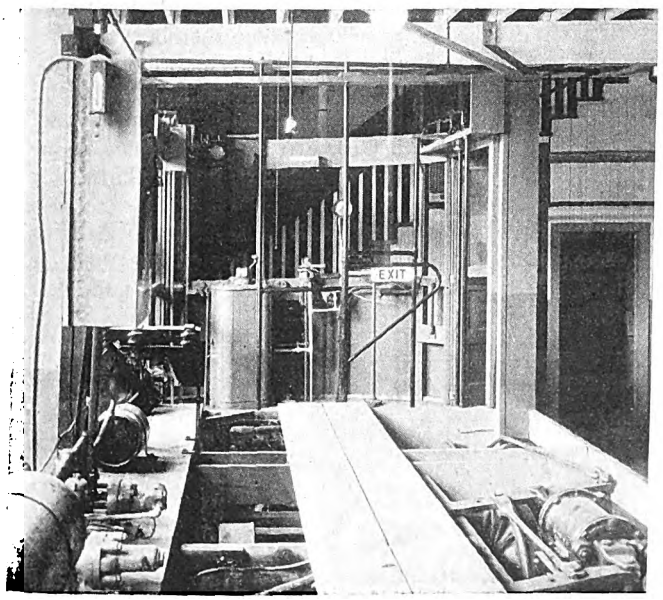
tion the superintendent of power stations devised and has applied for a patent for a device which overcomes the trouble. It consists of a small platinum wire suitably mounted and inserted through the hose a short distance from the fittings to be protected. An electrical connection from the fittings to the platinum, either with or without a small emf in series therewith, is so designed that it effectively transfers the flow of current from the fitting to the platinum and the cooling water.

Kansas City Modernizes Its Training Equipment

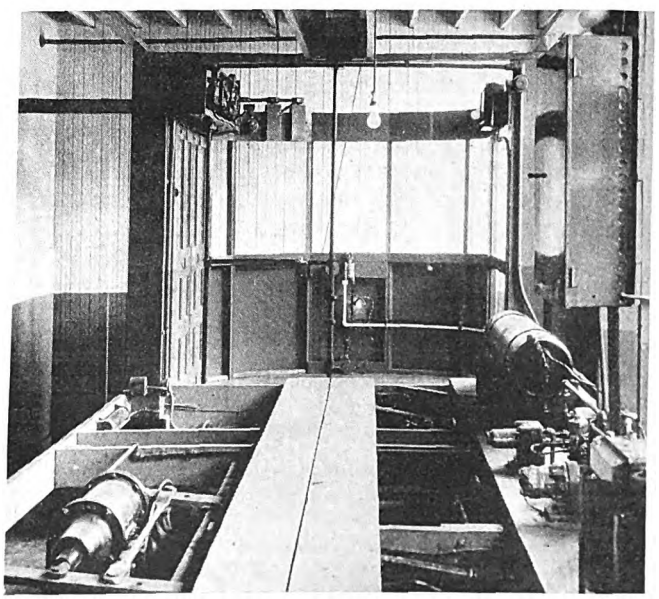
UPON the completion of the $6,600,000 rehabilitation program inaugurated in 1926 by the Kansas City Public Service Company it became necessary, among other things, to incorporate the features which have been added to the company's rolling stock into the instruction equipment in the training school. Prior to the rehabilitation the company had in service some ten or twelve types of cars with nearly as many types of control and it had been necessary to equip the instruction school accordingly. The cars are now of one general type and are equipped alike as to control and safety appliances. All have automatic air-control door engines, line switches, air governors, relays, sanders, thermostatic heat control, compressors, air reservoirs and brake cylinders. Controllers have been reduced to three types, HL, K-10 and K-35, which function alike for all practical purposes.

The reconstructed training car represents a modern transportation unit so arranged as to facilitate the examination and study of its auxiliary equipment. The forward vestibule is equipped with rear door control levers, hand brake, air valves for braking and forward door operations, air gage, K-35 controller, rear door signal, rear vision mirror and switches for both power and light circuits. A storage battery, relays, and an automatic line breaker are located on the left side of the car. The line breaker is incased in glass for observation of its action at close range. The thermostatic car heat control placed in the rear vestibule is designed for manual operation, with a series of small lamps substituted for the car heaters to illustrate its performance. The rear vestibule is also equipped with a door lever for use when the car is run as a two-man unit, a reverse valve and door engines, the latter installed above the door. The trucks of the instruction cars are mounted above rails with clearance to permit the free running of wheels and observation of the braking equipment. The brake rod is brought up over one of the cross members of the car frame to illustrate its action.

The supply, application, and exhaust air lines are painted in contrasting colors to facilitate tracing their relative positions in the braking system. Motor leads and all other car wiring are exposed. The car was designed and built in the company's shop and installed by its own mechanics at an estimated total cost of $2,500.



In this skeleton instruction car of the Kansas City Public Service Company a complete set of control, brake and door equipment is installed in full view



At the rear of the car is the air brake reservoir, air pump and governor. Rear platform equipment is included to show its action on a two-man car

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1927 Census Report

Statistics on 655 electric railways show increase in car mileage over 1922. Number of passengers carried increases

THE Department of Commerce announces that according to data collected at the quinquennial census of electrical industries taken in 1928, 655 companies engaged in the operation of electric railways in 1927 reported totals of 27,866 miles of line (first track), 89,642 cars operated, 2,120,774,257 car-miles, and 14,521,977,983 car passengers carried. As compared with 1922, the last preceding census year, these figures show the following decreases: Number of operating companies, 21 per cent from 826; mileage of line, 7 per cent from 30,070; number of cars, 7 per cent from 95,931; number of car passengers, 2 per cent from 14,881,857,530. The only item that was greater in 1927 than in 1922 was the number of car-miles operated, which shows an increase of 2 per cent over 2,081,085,455.

Electric railways reported totals of 3,878 buses in operation in 1927 (no data are included for bus lines other than those operated directly by electric railway companise), 130,015,315 bus-miles, and 398,323,932 bus passengers carried. These figures show increases over 1922 as follows: Number of buses, 954 per cent over 368; bus mileage, 1,731 per cent over 7,100,624; passengers, 2,373 per cent over 16,109,836. Foregoing figures for 1927 are exclusive of data for 32 electric railways which are believed to have been in operation in 1927 but which had failed to make reports prior to Sept. 14, 1928. These companies reported 3 per cent of the total pasengers carried in 1922. In order to make a true comparison with 1922, the figures for that year, as given above, have been adjusted by deducting the data for the 32 companies in question.

The 655 operating electric railways reporting for 1927 were distributed by states as follows: Pennsylvania, 81; New York, 80; Ohio, 55; Illinois, 42; Massachusetts, 26; California, 24; Indiana, 21; Iowa, 20; Michigan, 20; Texas, 20; Washington, 18; Virginia, 17; Kansas, 15; Missouri, 15; New Jersey, 14; Wisconsin, 14; Maine, 13; Tennessee, 13; Colorado, 10; West Virginia, 10; Minnesota, 9; North Carolina, 8; Oklahoma, 8; Arkansas, 7; Georgia, 7; Kentucky, 7; New Hampshire, 7; Florida, 6; Louisiana, 6; Utah, 6; Connecticut, 5; Maryland, 5; Montana, 5; South Carolina, 5; Vermont, 5; Nebraska, 4; North Dakota, 4; Oregon, 4; Alabama, 3; Arizona, 3; District of Columbia, 3; Mississippi, 3; New Mexico, 2; Delaware, Idaho, Nevada, Rhode Island and South Dakota, 1 each. The decrease in the number of operating companies from 826 in 1922 to 655 in 1927 is due to the fact, so the department points out, that 141 companies did not operate during any part of 1927 and 30 were merged with other companies between Dec. 31, 1922, and Jan. 1, 1927.

In the accompanying table a summary is presented for the electric railway industry for 1927, 1922 and 1917. Figures for 1927 are preliminary and subject to such correction as may be found necessary after further examination of the returns that were made by the companies which reported to the department.

Numerous Benefits Bestowed in Montreal

CONSIDERABLE relief work was accomplished during the year ended April 30, 1927, by the Montreal Tramways Mutual Benefit Association, Montreal, Canada. To members on old age pension $26,163 was paid during the year against $19,381 in 1927. On the permanent disability pension an amount of $15,469 was paid compared with $6,426 during the preceding year. Under the heading of death benefits $39,000 was paid, compared with $25,000 during 1927. To disabled members benefits amounted to $39,795, against $42,445 in the previous year.

The gross revenue for 1927-1928 was $232,010, and for the year 1926-1927, $258,903. Total expenses were $169,007, compared with $153,761. The balance transferred to the reserve fund was $63,002, and $105,142 for the 1926-1927 year.

The Montreal Tramways Mutual Benefit Association was incorporated in 1904. The number of members on April 30, 1928, was 3,843 against 3,754 on the same date of 1927.

SUMMARY FOR ELECTRIC-RAILWAY INDUSTRY: 1927, 1922 AND 1917

	1927 Totals of Reports Received Prior to Sept. 14, 1928	1922 Adjusted for Comparison with 1927*	1922 As Originally Published Comparable with 1917	1917
Total number of companies	998	1,166	1,200	1,370
Operating	655	826	858	943
Lessor	343	340	342	364
Total number of employees	†262,725	292,624	300,523	294,826
Number of bus employees (included in total above)	7,168	400	404	.....
Total miles of track operated	41,417.65	42,373.99	43,931.86	44,835.37
Miles of first track	27,865.70	30,070.34	31,264.26	32,547.58
Total number of cars (all types)	89,642	95,931	99,255	102,603
Total number of car-miles operated	2,120,774,257	2,081,085,455	2,138,281,674	2,139,801,530
Total number of car passengers	14,521,977,983	14,881,857,530	15,331,399,851	14,506,914,573
Number of revenue car passengers	11,802,916,612	12,335,286,642	12,666,557,734	11,304,660,462
Miles of bus route (round trip)	‡13,031.34	683.86	685.36	.....
Number of buses	3,878	368	370	.....
Total number of bus-miles	130,015,315	7,100,624	7,116,404	.....
Total number of bus passengers	398,323,932	16,109,836	16,120,115	.....
Number of revenue bus passengers	325,919,601	12,783,202	12,791,308	.....

*The figures given in this column are totals for those companies which made reports for 1927 prior to Sept. 14, 1928, and those which operated in 1922 but went out of existence as separate companies prior to Jan. 1, 1927.

The 1922 figures for the companies which are believed to have operated in 1927 but which had not submitted reports prior to Sept. 14, 1928, are as follows: Number of operating companies, 32; total number of employees, 7,899; number of bus employees, 4; total miles of track operated, 1,557.87; miles of first track, 1,193.92; total number of cars (all types), 3,324; total number of car-miles operated, 57,196,219; total number of car passengers, 449,542,321; number of revenue car passengers, 331,271,092; miles of bus route, 1.5; number of buses, 2; total number of bus-miles, 15,780; total number of bus passengers, 10,279; number of revenue bus passengers, 8,106.

†Not strictly comparable with 1922 because of the fact that some establishments which at the census for 1922 included data for power plants in their railway reports made separate power-plant reports for the year 1927.

‡Not strictly comparable with 1922 because of the fact that the schedule for 1922 called for miles of bus lines, *one way*, whereas the 1927 schedule called for miles of route, *round trip*.

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Opportunities for

Improving Public Relations

Through Employee-Customer Contact

This article, based on the report of the committee on employee-customer contact of the American Electric Railway Association, contains a wealth of ideas on a subject which is commanding the attention of every electric railway operator today. The members of this committee, responsible for the report, are Thomas Fitzgerald, vice-president Pittsburgh Railways, chairman; David W. Gordon, director service improvement Chicago Rapid Transit Company; Clinton D. Smith, superintendent department of personnel Cleveland Railway; D. W. Snyder, Jr., vice-president Illinois Traction System; C. E. Thorney, assistant to vice-president Chicago, North Shore & Milwaukee Railroad, and W. E. Wood, president Virginia Electric & Power Company.

NECESSITY for improvement in the technical and mechanical features of street railway operations has overshadowed the need for development in certain phases of public relations work, where antiquated methods have not appeared so strikingly obsolete as out-of-date equipment. Remarkable progress has been made in the design of cars, although it is generally admitted that the evolution is only in its first stages, but much of the present operating practice, to which custom has given the stamp of approval, has not been subjected to such critical analysis.

One of the most important effects of the increased use of the automobile upon the duties of the trainman has been to make of him not merely an operator or fare collector, but also a traveling agent of the company, who personally introduces its product to the prospective customer. The progress of the street railway industry is largely dependent upon the efforts of the trainmen, whose contact with the public can be made a major operating asset not available to the manufacturer of commodities. It must be admitted that a platform man, mindful of the possibilities in his job, alert to the necessities of the industry, and disposed to co-operate with the management, is in a strategic position to render service of great value. The success of a policy aimed to take advantage of employee-customer contact is contingent, therefore, upon the willingness and ability of the employee to co-operate.

Improvement in the state of public relations is not the only objective of the plan. The industry must now solicit business, and any measures which will tend to encourage car riding should be utilized. It is difficult enough to retain present patronage, much more so to gain new customers; but unless the trainmen are enlisted in support of the office policies, and equipped to assist in carrying them out, the best laid plans may fall far short of success.

It was thought at one time that courtesy on the part of trainmen was the single requisite in the matter of public relations, but the exigencies of the present situation have revealed the inadequacy of the former view. Today it is essential that the platform man co-operate with management in its effort to provide efficient and reliable service, greatest speed, and safer transportation in comfort—and that he also act as advocate when the opportunity is presented.

Street railway problems are difficult to solve, but employee-customer contact is a factor in the answer to most of the difficulties confronting the industry today, and its influence on results cannot be ignored. The mental attitude of the worker is of fundamental importance and justifies first consideration.

The cause of unsatisfactory public relations may generally be traced to lack of information on the part of the customer concerning the operations of the company. Success without the support and co-operation of the public is difficult, if not impossible to attain. The real purpose, therefore, in utilizing the employee-customer contact in the interest of the company is to convey to the public a knowledge of a business that is conducted under the same fundamental principles as any other enterprise. A general understanding of this fact alone will contribute to an improved state of public relations.

The industry is fortunate in having available exceptional opportunities for informing the car rider of its operations, winning the confidence of the public, and selling its services. The ownership of space for car ads, for instance, is an asset which should be used to the fullest extent in a plan designed with a definite objective. Haphazard announcements fall short of the mark. No company today follows a hit-or-miss policy in the actual operation of cars, and the publicity program justifies constructive thought to the same degree.

Publicity items are generally prepared for the single purpose of improving public relations, and much originality has been displayed in this field. The average person, however, still has the impression that the railway companies are making large profits, concealed from public view by the "mysteries" of the business. Under such conditions, the state of public relations might be satisfactory, as far as the lack of militant opposition is concerned, but active co-operation and support are more to be desired. This can be obtained by taking the public into confidence and informing patrons of the difficulties confronting all operators, and of the economies effected in an effort to overcome them. When the financial rec-

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ord is an open book, the street railway industry will not always be on the defensive, which has been its characteristic attitude in the past.

Advertising is not properly a part of this study but its function is similar to that of the general subject, and its place in a comprehensive policy of "selling the company" is to act in support of the primary effort to utilize the natural advantages offered by the contacts between employee and customer. Few industries, if any, enjoy a position of comparable strategic value. So far, this element of position has been overlooked, for the most part, in programs aimed at winning the confidence of the public, and the value of the trainman as an agent for securing co-operation has not been fully realized, except in a few instances where marked success followed well-directed campaigns.

Newspaper advertising can be utilized to advantage in a systematic display program, portraying the duties of the individual employee and designed to promote friendly co-operation between the trainmen and the public. A series of advertisements, directed to the personnel of a company, not only creates a greater confidence in the road, but also shows definite results in additional business. Other forms of educational advertising can be used to good effect and can tie in securely with the fundamental newspaper display program.

But after publicity has called the attention of the public to the trainman, the chief problem still remains—that of making the contact position of the trainman an asset rather than a liability. The attention of the street railway industry has been directed recently to the advantages, both to the company and to the public, inherent in the contacts between employee and customer. These contacts, when properly analyzed, will be found to be at least as effective in producing favorable results as the customary advertising program, for the scope of possibilities is much broader. The plan lends itself readily to the new conception of the term "publicity," which has outgrown its narrow field, as commonly understood, and now includes provision for informing the public about matters which heretofore have been considered the business of a company alone. Good public relations can only be founded upon confidence, and confidence can be won only by telling the whole story. This can be done in conversation as well as by print, and in a manner fully as convincing.

Enlisting the Employee in Public Relations Work

The co-operation of employees, so essential in promoting good public relations, is readily secured by the broad-minded, alert executive when he has only a small number of men to supervise, and when, by frequent contact with them, he gains knowledge of their circumstances, characteristics and mental attitudes. To secure co-operation from a large working force has become the problem for which solution is sought.

The fundamental is not obscure. The problem resolves itself into decision as to the best methods of maintaining contact, of communicating an explanation of the company's business, and of acquiring an understanding of the attitude of the employees.

In the first place, the employer, manager, or supervisor must be in a position to say that the workers will share in the prosperity of the company. If the hands of the officer are tied, if he cannot give assurance that initiative will be rewarded as revenues permit, then co-operation is difficult to obtain. The worth-while employee measures his services in terms of payroll, and, therefore, the employer must be free to state that the progress of the company will benefit all.

Secondly, co-operation should be sought only when the supervisory force has such a complete understanding of the company's policies that they can answer readily the many questions which arise, without being embarrassed when an inquiry is made.

Transportation is a community project. The appearance of a newspaper article dealing with any company activity makes it necessary that the supervisory organization be so informed on the subject that the men may discuss it freely with associates, and thereby eliminate confusion in the minds of others.

When only partial information is given to the leaders, or contact men, their initiative is limited. The first concern in dealing with this subject is to make a business family out of an official organization. Co-ordinated effort will naturally result from an attitude which gives consideration to the prestige that should be attached to the various positions held by the key men. When the official family is left to make its own conclusions on the policies of the company, a feeling of suspicion and, frequently, misstatement of facts generally follow.

An Uninformed Employee is a Liability

Opinion is probably unanimous that an uninformed and disgruntled employee is a liability, but there is no similar agreement as to either the causes of dissatisfaction or the items concerning which the employee should be informed. Among the causes of dissatisfaction are: (1) Lack of consideration shown to the employee by management; (2) influence of bad leadership which has prevailed in absence of company leadership; (3) bad working conditions, which exist frequently because of ignorance of conditions on the part of leading executives, and (4) misinformation, which generally exists when contact and correct information are lacking.

Lack of Consideration—Dissatisfaction and lack of interest are created by the failure of a supervisory officer to recognize the individual as an associate. The greeting, the handshake, and the smile, when natural, are acts of consideration. Every employee expects them, and for that reason alone should receive them. In some cases, when arrangements are made closely touching the interest or habits of the employee, his opinion should be sought. Consideration is the first and basic fundamental for securing the co-operation of employees.

Influence of Bad Leadership—The main cause of disloyalty is the neglect on the part of supervisory officers to exercise a leadership that has been allowed to drift to outside individuals. A group of employees expects leadership and will follow a leader who always advocates sound policies.

Bad Working Conditions—Dissatisfaction resulting from a faulty condition of physical environment, during working hours, is most readily corrected when the executive who controls the situation maintains a proper contact with actual operations. He should not shoulder the responsibility of others, but as a true supervisor, must know what is going on. Much has been said about the use of the automobile by transportation officials. The chief objection to this practice is that it tends to take the official out of the environment of the salesmen, and a sales-manager cannot properly guide his force when he does not know the conditions under which it works.

Misinformation—Rumors, gossip, and misstatements result from failure of authorized officials to give out

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correct data, and to maintain constant communication with their men. Under a policy of informing the men as to the development of the day, frequent contact and other means of notification will spread the right information almost automatically.

The average human being, out of contact with progress and left to himself or to association with similar uninformed employees, will construct beliefs from mere impressions or false knowledge. It is the trainman, thus neglected, who is most liable to develop into a chronic knocker, and in conversation communicate to patrons a biased, but deep-rooted distrust of the company.

But the employee has an interest in his job when he feels it is a responsible one—when he hears it talked about at company meetings, reads about it in newspapers, company publications and bulletins. He becomes ambitious to be worthy of the commendation given him, and realizing the importance of his work strives to maintain the good reputation established and to repair the effects of misinformation.

General and Specific Information Needed by the Trainman-Salesman

It is an axiomatic fact that in any business well-informed employees render the most efficient service. In the public transportation business this is especially true. The employees of a street railway company differ from most salesmen in that trainmen both manufacture and sell the company product. Obviously if they are not well-informed they can not produce the best service, much less sell it to a temperamental public.

For the best results, it is necessary that every employee of the company measure up to the following three requirements: (1) He should possess a clear understanding of the theory upon which the business is founded, of the conditions which justify its existence, and of the reasons back of the policies and practice adopted by the owners and management; (2) he should be a finished specialist in that phase of the business with which he is connected, be he track greaser, trainman, director of publicity, or manager, and (3) he should have a sincere desire to serve the public most efficiently, to gain the public's friendship for his company, and to carry out the policies of his superiors in the interest of all concerned. An uninformed employee cannot measure up to these qualifications. Educational work, interestingly and intelligently conducted, is the only means of developing employees so qualified.

As soon as the employee really begins to understand the problems of the business, if he is a normal human being, he will begin to be interested in those problems. This interest in turn develops into enthusiasm, and the inmate human instinct to overcome difficulties then becomes operative. The employee becomes a constructive factor in the industry. Not only is he working for his day's pay but he is getting out of his work a sense of satisfaction—a "kick." He is no longer a lifeless automatum but is a part of the prime moving force of the organization.

His increasing knowledge of the business brings him to realize its necessity and justification, to see that it is up to him to help make it succeed. Like every red-blooded man, he is ready to "tackle the job." The apparent difficulties in his way only serve to sharpen his wits, for by this time he is in the game to win.

But apart from interesting him in "playing the game," this understanding will prove to him that his own proper self-interest requires that he help make the business a success. For how else can he reap the reward due him unless his business be successful?

There are many means of interesting and informing the employee, none of which will probably be successful without the enthusiastic and aggressive backing of the very head of the organization, who in turn has the job of arousing the enthusiasm of the whole official family in the accomplishment of this work.

The employee should receive information relative to the following fundamentals: (1) General and simple economics of street railway operations; (2) the forces of competition; (3) methods of meeting the competition, and (4) regular information of all company activities.

General and Simple Economics of Operation—When the employee receives periodically a statement of gross revenues, operation expenses, taxes, etc., the mystery of what becomes of the millions collected every year will be explained. The potency of the millions vanishes when expenses and revenue per trip are considered the unit.

The employee should understand the mechanics of operation, particularly of the transportation department. He should know the relationship between the peak and the off-peak business, so as to appreciate the extraordinary expense of extra equipment needed for the short period of maximum traffic. Other economic facts are pertinent information, and will suggest themselves once a plan of spreading the information is adopted.

The Forces of Competition—The employee should know that regulated transportation today is affected adversely, in varying degrees, by the privately-owned automobile, the taxicab, the telephone, de-centralization of merchandising stores, the radio, and the desire of the public for luxury and personal service. An appreciation of the situation will cause the employee to be interested in receiving suggestions designed to counteract the competition.

Methods of Meeting the Competition—Plans of the company to secure new business should be passed on to the employee. It may be sales training of the individual employee, one-man operation, new cars, economies of operation, etc.

Regular Information of All Activities Should Be Issued—Much can be done, also, in keeping the employee informed concerning not only his own road's service but also that of associated companies and connecting lines. For if he furnishes detailed and reliable information to his customer, he performs an inestimable service in the interest of better public relations and increases business.

Methods of Transmitting Instruction

It is impossible to assemble large groups of trainmen, but it is feasible to convene recognized leaders or representatives, who, when conditions are understood and the good faith of the company is recognized, will transmit to others the general principles of the company plan, and the inspiration to co-operate.

A method of instructing by classes has been followed by some companies with good results. It has a psychological value, in addition to its educational value, for the very fact that management is endeavoring to enlist the support of the employee, and to equip him for further service, removes one of the principal causes of industrial unrest, as pointed out by economists, namely, the failure of management and ownership to regard labor as an associate directly interested in the success of a business.

The distribution of publications, such as general literature on the industry, house organs and bulletins, will accomplish results in a sufficiently large number of cases to justify the effort.

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Contact between officers of the company and the men all along the line goes far toward removing causes for antagonism, which has characterized relationships in industry in the past.

The education of the employee for the purposes outlined is a difficult undertaking, but when properly accomplished amply repays the effort put into it.

Complaints Afford Opportunity for Salesmanship

The handling of complaints, which concerns employee-customer contact directly, is a much larger problem than that presented by the written complaints received by the management and dealt with directly by it. For every patron who takes the trouble to write to the company there are many more whose displeasure reaches the ears of the trainman only. Consequently, there are many opportunities for true salesmanship in the somewhat neglected field of the verbal complaint.

The extent to which expediency should govern in arriving at a correct attitude toward complainants cannot be determined by snap judgment, for the ethics of the subject may be debatable, and a company should always be adverse to doing an injustice to an employee. Since two conflicting interests are at stake in this field—the necessity for improving public relations, on the one hand, and employee relations, on the other—neither the slogan, nor a policy designated by its reverse, will prove to be a solution to the problems presented. The complexities of the present social and industrial order have relegated such simple methods of solving problems to the rôle of antiquities. Modern practice demands a more rational treatment of situations, to which cut-and-dried methods in good standing in the past are no longer applicable.

It is true that some patrons deliberately impose upon a street railway company, but the percentage is exceedingly small. It is possible, moreover, for a patron to be sincere in making a mistaken complaint. Harsh treatment, in either instance, accomplishes no good end and is more damaging to the interests of the company than the imposition—or the mistake—of the patron.

There is a tendency today toward a recognition of the natural desire of humanity to do the right thing, and to avoid making mistakes; and when steps are taken to remove misunderstanding, human relationships are in great measure readily adjustable. For this reason, controversy between trainmen and the public can be, and is, frequently settled without recourse to a makeshift slogan.

Handling of written complaints within the office is important, for the same complaints may also be made verbally to the conductor and, moreover, the attitude of the customer toward the trainmen is influenced by the manner in which the complaint has been settled by the office. The difficulties of the platform men may be lightened or increased by office action toward a complaint.

The strategic position of the trainman in the matter of complaints and criticism has not received the consideration which the subject deserves. The constant stream of complaint and comment directed at the trainman, or uttered in his presence, is of undisputed value to a company. Expressions of that kind are actually sought by some manufacturers to enable them to improve a product or to understand the market. A street railway company sells its wares only through its own employees, and is in an enviable position to know what the market wants and dislikes about its service.

A complaint is not always a "knock" but may frequently be viewed as a suggestion, from which, in many cases, the company could undoubtedly profit. The benefits to be derived from verbal criticism and comment would possibly justify a definite plan whereby the company could receive, through the various carhouses, a summary or digest of the remarks made about the service, which the platform man hears daily. Instruction of trainmen as to circumstances out of which complaints arise, and the attitude they should take toward those making complaints, should be provided. The necessity for a consistent policy in the matter is set forth in the following section of this report. The self-interest of employees is involved, and this alone should remove any difficulties arising in the introduction of a system of instruction.

Management Responsible for Policies

The determination of the company policies which govern the relations of the front-line employees with the public is unquestionably the responsibility of the management. The supervisory force is responsible for the publication of these policies and for the proper instruction of subordinates concerning them; but the responsibility for actually carrying out the policies rests with the public-contacting employee and, in the last analysis, this is the phase of company policies in which the public is most deeply interested—the manner in which they are carried out.

Hence, any plan for obtaining or developing a favorable public attitude toward a company should be constructed on the realization that the public-contacting employee is an essential factor. Such a plan, to be effective, should include a comprehensive scheme for thorough and systematic training of employees in the art of meeting the public.

A course for employees having contact with the public should include the following, in addition to the data concerning the business, to which reference has already been made:

1. Instruction in the elements of good personal service, such as—(a) Attentiveness, or the interest and consideration shown by an employee in giving service that satisfies the customers' needs; (b) information, or the adequacy of the answers given by an employee in response to the customer's questions; (c) speech, or the facility with which an employee expresses himself when addressing a customer; (c) politeness, or an employee's use of the commonly accepted and routine polite acts and expressions, and (e) appearance, or the cleanliness and attractiveness of person, the appropriateness and neatness of clothing, and the tidiness of working equipment.
2. Instruction in the fundamentals of salesmanship.
3. Development of company loyalty or *esprit de corps.*

To be effective, company rules and regulations for the guidance of employees, and courses of training in meeting the public should be made with the knowledge that situations arise for which the employee is not in any way responsible. In a training course we need to give consideration to these situations.

The time has arrived when the industry must take cognizance of its shortcomings in the fields of employee and public relations, and place these subjects—of such vital importance to successful operation—on a par with technical and mechanical problems in respect to the need for immediate and systematic investigation. No phase of the industry invites research with greater promise of paying results than the subjects which concern these relationships, but it is perhaps the most neglected field in the transportation business.

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Lubrication*

By Dr. W. B. D. Penniman
Consulting Chemist, Penniman & Brown,
Baltimore, Md.

ELECTRIC RAILWAY energy may be loosely divided into (1) transforming and distribution costs; (2) heating costs and their regulation; (3) dragging brake shoes, and other mechanical defects, and (4) lubrication losses. Aside from the increased use of electric current in cold weather due to the necessity of heating the cars, there is a marked increase in current consumption due to friction.

If over the period 1925-1926 we consider the dragging brake shoes as constant throughout the whole temperature range, or the heaters as constant when the average temperature is below 20 deg., we still have an increased use of current due to a variation in frictional resistance from 3.5 kw.-hr. per car-mile to 5.0 kw.-hr. per car-mile, or a change of 40 per cent in frictional resistance between zero and 100 deg. F., the extremes of our climate.

It is the custom of the United Railways & Electric Company of Baltimore to measure current at the point of delivery before conversion, so that the cars are charged with conversion and line losses, as well as motor losses. These are less in cold weather than in hot, so that the heater load is carried in part by decreased electrical losses in cold weather, but the frictional losses increase so rapidly this fact is not apparent. If we can succeed in reducing the variation in friction losses so that they are the same in winter as in summer, we can expect the power consumption of the cars to curve downward due to the greater electrical efficiency of distribution and motors in cold weather.

The custom of most railways is to consider the cost of oil as the main factor, and largely disregard power losses. Power costs in Baltimore when this investigation was started were about $1,500,000 while the cost of lubricant was only in the neighborhood of $8,000 a year, or about one-half of 1 per cent.

There are two ways of avoiding the power loss and other losses of the sliding of one solid over another. The first is by substituting a rolling motion for a sliding one, as in the ball bearing or roller bearing. The second method is to modify or change the rubbing surfaces in such a way that physical contact between the solids is avoided, or practically avoided, by substituting liquid or almost liquid surfaces for solid surfaces. Layers of another substance, generally oil, are introduced between the two rubbing solid surfaces. This oil adheres to each of the rubbing surfaces, smoothes out their mechanical and molecular irregularities, and hence the solid surfaces are no longer in contact.

Of the three kinds of friction, dry, greasy and viscous, the last kind is the most desirable. Bearings lubricated in this manner often are spoken of as being perfectly lubricated, or as having full fluid lubrication. If this is not obtained, or is not obtainable, "greasy friction" is our second line of defense against the undesirable and destructive dry friction.

Let us consider the mechanism and operation of a perfect bearing with this desirable full-fluid lubrication. Fig. 1 shows a chart taken from an article by Karelitz, entitled "An Investigation of the Performance of Waste-Packed Armature Bearings." This is a vertical section through the middle of a rotating journal which is supplied with an abundant amount of oil. The rotating journal acts as a pump and there is a place where liquid is under a maximum pressure and another point where

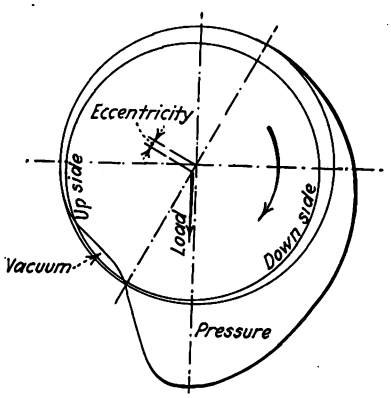

Fig. 1—Hydrostatic pressure in a bearing with perfect lubrication

there is a vacuum space. This vacuum space exists a little in front of the line of high pressure, and evidently if new oil is supplied at the vacuum point, the pumping action will supply the journal with a sufficient amount of lubricant, and there will not be any undue amount of oil running out at the ends of the journal itself, unless the vacuum is broken by admitting air. It must not be forgotten that the actual distance separating the two metallic surfaces at the point of greatest pressure is small, and in extreme cases adherent coatings of lubricant may be bearing the most severe part of the load, but if sufficient oil is supplied, this can largely be avoided. This final layer, if the lubricant is badly designed, may be too thin, but if the oil has high adhesive properties, it can and should be of such a thickness that the metallic surfaces are protected. When this perfect bearing is in motion, if there be a sufficient supply of lubricant, the frictional resistance may be summed up as follows:

1. It is almost independent of pressure.
2. It increases with the speed of the surfaces.
3. It increases with the area of surfaces.
4. It is almost independent of the condition or the material of the surfaces.
5. It depends almost entirely on the viscosity of the lubricant.

While in motion, if the bearing is designed properly, the main thing we have to consider, is to obtain an oil of

*Abstract of a paper presented at the annual convention of the American Electric Railway Engineering Association, Cleveland, Ohio, Sept. 22-28, 1928.

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minimum viscosity. The pumping action at high speeds is sufficient to carry the oil to the point of high pressure. In addition to the viscosity, we also require an oil of high "greasiness" to take care of starting and very low speeds.

We shall now consider the way in which lubricating oil for electric and steam cars is generally bought, and the reasons why these oils are chosen. Winter oils and summer oils are used on the theory that a thinner oil is required in cold weather. As the atmospheric temperature at which the oils are in use varies in this climate from zero to 100 deg. F. most of these oils, if suitable at the higher temperatures, would not be suitable at a lower one.

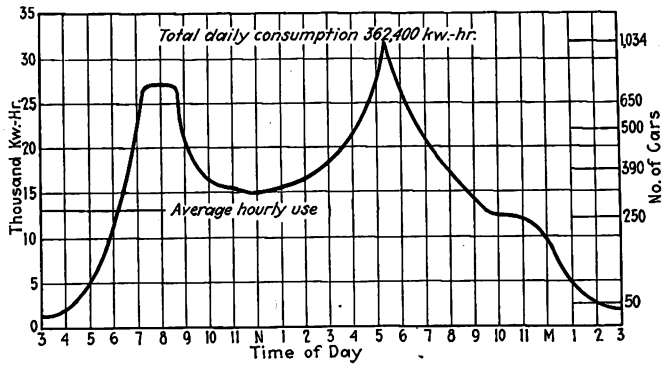

Fig. 2—Typical hourly power distribution curve for United Railways & Electric Company of Baltimore

Oil specifications, in general, make no mention of the oiliness or adhesive properties of a lubricant. An oil may be both coherent to itself and adherent to the metal, and in ordinary practice of buying oils of high viscosities (cohesion) we secure an oil of relatively high oiliness (adhesion).

Necessary oiliness or greasiness of the lubricant has tc do with the fact that the surfaces of liquids and solids have energy of a great power, and this power is often selective. Physicists and chemists have given the name "adsorption" to this special property of matter. The use of the surface attraction or adsorptive powers are numberless, ranging from activated charcoal to the ore flotation process.

The metallic surfaces of our bearings have this adsorptive power, and so we add to the oil of extremely low viscosity other material which will be selectively adsorbed by the metals from which these greasy layers are built. It has long been known that petroleum oil is improved by the addition of small quantities of other substances, lead oleate, aluminum soaps in non-chatter oils, blown rape seed in marine engine oils, etc. Wells and Southcombe have patented the addition of small quantities of fatty acids, and it is common shop practice to use lard oil or tallow oil when bearings become hot.

The commonly used term "oiliness" or "greasiness," though applicable to the very thin layers that are very firmly attached to the metal, by no means tells the whole story of what these should be, if we are to get efficient lubrication with the very imperfect bearings that are necessarily used in practice.

Having laid down the outline of our theories on which our work has been done, we think it well at this point to epitomize from a practical standpoint. First, get your bearings in as good condition as possible and supply them with oil in the proper place. Second, use an oil of minimum viscosity. Third, use an oil of maximum oiliness. Fourth, use plenty of oil.

In considering the bearings and lubricants of the United Railways & Electric Company of Baltimore we will not concern ourselves with any data except that of the bearings when the car is traveling at the rate of 12 m.p.h. The bearings and their characteristics are as given in Table I.

In the journal bearings the peripheral speed is the lowest of any, and the pressure per square inch the highest. It is a well-known rule in lubrication that a bearing running at a low speed and heavy load requires a heavier lubricant than another bearing running at a higher rate of speed and a lighter load. The practical effect of this is that an oil that has sufficient viscosity "oiliness" and "mushiness" to take care of our journal lubrication is at least heavy enough to lubricate the other bearings of the car, unless temperature conditions of the compound bearings are markedly different.

TABLE I—BEARING CHARACTERISTICS

	R.P.M.	Rubbing Speed Ft./Min.	Pressure in Lb. Per Sq.In. of Projected Area
Eight journal bearings	122	127	252
Four gear end axle bearings	122	160	54
Four motor end bearings	122	160	13.5
Four pinion end motor bearings	602	435	130 to 22
Four commutator end motor bearings	602	470	approaches zero

Speed of car 12 m.p.h.
Total weight of car 50,000 lb.

There are many dust guards on the market, but they soon become inefficient as dust guards and oil seals, because they do not remain tight. The failure of these guards is due to lack of provision to take care of the varying position of journal and bearing. We have devised an oil seal for which patent applications have been made, to remedy this defect, and not only exclude dirt and water, but preserve the maximum saturation of the waste, so that plenty of oil is available. There is no perceptible wear on the leather after two years and the whole system is now being equipped.

Axle and armature bearings offer a more difficult problem than the journal bearings. The feed of the lubricant has to be regulated, for an excessive supply will leak out at the ends of the bearings, and if this oil finds its way to the insulation compound of the motors it softens and eventually destroys it. For this reason, after a short period of use of a light oil in these bearings, we felt ourselves compelled to use temporarily a heavier oil than we otherwise would, heavier than the oil which we use in the journal bearings. The problem was to keep an abundant supply of proper lubricant in the bearing. Evidently, this can be done in two ways: (1) by regulation of the inflow, and (2) by regulation of the outflow.

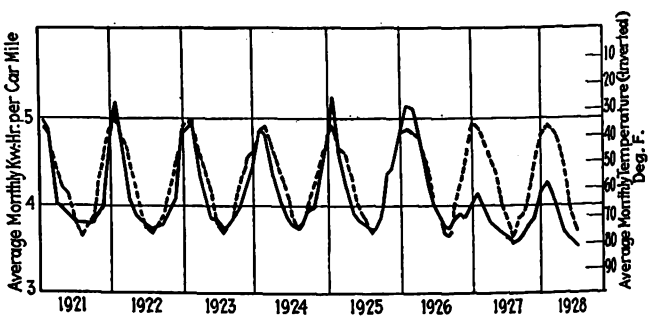

Fig. 3—Power consumption and temperature curves using average monthly kilowatt-hours per car-mile and average monthly temperature

The gearing of the car, like all gearing, is a source of

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TABLE II—HOT BOX RECORD

		Per cent
	JUNE, 1926	
8332	Total	100
198	hot	2.4
7	smoking	0.8
	MAY 2, 1927	
7620	Total	100
9	hot	0.12
4	smoking	0.52
	MAY 10, 1928	
8180	Total	100
16	hot (6 erroneously reported)	0.2
0	smoking	0

great loss. We have reduced it somewhat by seasonable changes in the lubricant, but limitations of construction and operation hamper us. Our work on automobile gearings may lead us to favorable results in street car gears.

About 30 per cent of the total cost of power is for power that is never actually used. This may seem at first unreasonable, but Fig. 2 will indicate why this should be. It shows that the demand is irregular, as we not only have daily peaks, but also a large increase during the cold weather. This increased use of power in cold weather has been due largely to the heater load, though a glance at the viscosity curves makes it plain that the estimate, making the division between the heater load and the power load, is incorrect and the heater load overestimated.

To determine facts a section of track in the suburbs was selected that connects by equal grades two hills of about the same height; a car under test was brought to the top of one of these hills, the current turned off and the car released and allowed to coast down one hill and up the other until the potential energy of the car had been expended in its oscillation, and it came to rest in the valley. The coasting ability of the car with various lubricants was determined in several tests.

To make a more detailed study of the different kinds of bearings and lubricants that might be used, a car was selected and thermo-couples were placed in each bearing in the same relative position and as close as possible to the bearing surface. This car has 24 testing units in five different groups, the condition of running of each unit of the group being practically the same. As an example of the value of this test car we start with full knowledge of the power consumed and the temperature of the bearings of oil A. We then replace the oil in half of the bearings with oil B and run the car in service to neutralize the effect of oil A. Then a test run is made in which half the bearings are lubricated with oil A and half with oil B. Temperatures of all bearings are recorded and total power consumed. This gives us data sufficient to evaluate oil B in comparison with oil A on all or any of the bearings.

The bearings of the car have all been accurately measured and weighed and they are removed from time to time for examination and to determine their loss in weight. One of the first observations made on this car of interest and of importance had to do with the length of time that the ordinary journal bearing must be run before it has reached a condition of minimum friction losses.

Fig. 3 illustrates what has been accomplished. The cold weather peak is still present, but is very much reduced in height and we believe that so far as bearing friction is concerned it will disappear during the winter of 1929-30.

When the system is fully equipped, the general trend of the curve both winter and summer will drop down to the neighborhood of 3½ kw.-hr., which will mean a further saving of considerable moment. The power savings in 1927 were $176,000, to which we should add a marked decrease in bearing renewals and general machinery wear. The cost of the lubricant has gone up from about $7,000 a year to approximately $15,000, but this cost of lubricants will go down again when the lubricating appliances are on the entire system. That we have been successful and are on the safe side is shown by our hot box record, given in brief in Table II.

Economies to Be Effected by

Labor Saving Machinery*

By W. T. Rossell
General Manager Pittsburgh Railways

THE use of labor-saving machinery is a purely economic problem. Assuming a certain amount and quality of necessary work being performed by a given number of men, the cost of this labor, together with all necessary overhead including supervision, housing, etc., gives a unit cost for the work. If a machine of known capacity be used in place of hand labor, the unit cost of the same work is calculated by allowing proper interest on cost of machinery, depreciation and maintenance, and the cost of such labor as may be required, together with all overhead. A comparison of these costs will then determine whether the purchase of the machine is advisable.

Of course, there are other factors, varying with the special conditions of the problem, such as the quality of the workmanship, which may not be the same in both instances, and such as the more complete control which is possible where the machine is used. Thus the individual problem may be solved. As in every economic problem, there are always certain hidden factors about which the data are insufficient that may affect the decision.

It is useless to expect the best judgment at all times from the men charged with the daily routine work, since this often tries them to the utmost, and they have little thought or enthusiasm remaining for the careful and detached survey of the problem that is necessary for the best judgment. With this in mind, organization should provide a department whose principal function would be the solution of this problem. In the case of small organizations, specified times should be set apart for the operating man to study this subject.

Those who have this duty should, and must for the best results, go out to other properties, both within and without the industry, and study what is being done. In this way only can the proper perspective be obtained. It would be strange indeed if a man seeking such information could not find something of value on each property that he visited. It is believed that in no other way can the best results be obtained.

The advertising in trade journals and other sources shows much of value, and any tool or machine which

**Abstract of a paper presented at the annual convention of the American Electric Railway Engineering Association, Cleveland, Ohio, Sept. 22-28, 1928.*

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seems to hold any possibilities should be investigated and its application to the industry studied. In this way there would be a constant flow of small tools and machinery onto the property for trial, and with their trial there would tend to grow an improvement in the method of doing all work.

In the track department, in recent years, there have been brought out many new and valuable tools. There are cranes, concrete breakers, steam and electric shovels, grading devices, spreaders, small tractors, tamping machines (both electric and pneumatic) for ballast and concrete, spike-driving machines, cutting torches, welding methods of various sorts, rail grinding machines, track drills, power wrenches, and small tools too numerous to mention.

Anyone who has followed the course of track construction methods during the last two decades cannot fail to see the beneficial influence of such tools upon the methods of track construction. The modern construction gangs in the large cities are models of efficiency, and have almost reached the high standards of shop manufacturing processes. The smooth flow of materials and the progress of the work should be of interest to anyone, whatever his department, owing to the fact that many of the methods used have application in other lines of work.

The maintenance of track has not reached the same degree of perfection. It cannot be urged too strongly that, in this department of trackwork, surveys and studies be made and plans worked out for the development of track maintenance on an overhaul basis and with an efficiency comparable to that in use in track construction work. The use of small cranes and moving devices, and of trackmen in larger groups, organized more in the direction of specialization, together with the greater and greater use of all forms of track tools and machinery, offer very great possibilities for improved maintenance and lowered costs.

Overhead Lines

In the overhead lines department the construction groups employ a number of very interesting tools and machines. Many of the tower trucks, reels and methods of stringing wires and feeders are worthy of remark. The use of cranes, post-hole diggers, paint-spraying equipment for poles, cutting torches and welding apparatus may be seen on many properties.

In this department, as in the trackwork, the routine maintenance ordinarily shows a woeful lack of the coordinated use of tools and overhaul methods. It might be stated at this point that such development as in trackwork would probably show a considerably improved maintenance with lowered costs.

In the shops, of course, the variety of tools used and which might be brought into profitable use is almost endless. We have all of the standard tools such as lathes, drill presses, planers, special drilling and honing devices, as well as steam hammers, cutting tools and wood-working machinery of various sorts.

In addition to this, the bench work as ordinarily practiced lends itself to the use of all sorts of small hand and power tools and machines. Here again, advertising in the trade journals and other sources could well be scanned for additional labor-saving machinery.

A few interesting small machines might be cited: A pneumatic tool for grinding valves, and the so-called "blacksmith's helper" or small power-driven hammer. The use of the large riveting machine, together with jigs and dies that may be devised for special purposes, would show a tremendous saving in labor and improvement in the quality of output. Also, there have been developed, and are now being developed on some properties, power-driven wrenches and jigs for the assembly of trucks and other equipments, which show great ingenuity and inventive talent.

More and more, as the work is laid out along lines of mass production and specialized labor, will the need of a tool for a special process come to the front. We have in the shop department cutting torches, automatic welding equipment for wheels and other parts, portable rivet heaters, paint-spraying equipment, and many other tools and machines of wide variety.

Transportation

Even in the transportation department there are in process of development certain machines which, it is believed, will move the industry a long step forward in performance. There are now small machines which measure and show on a printed record, on individual cars, the time during which the car is in motion, the rate of speed at all times, and the length of stops.

In addition, headway recording devices are now in process of perfection which can be used to bring into a central dispatching bureau a picture showing the passage of cars at various selected points throughout the system at all hours of the day. This information, recorded on timed cross-section paper, together with the development of a group of emergency inspectors mounted on motorcycles, offers possibilities of improved regularity and speed of service without limit.

Office Work

Showing the wide application of machines to all forms of office work are the various types of computing, bookkeeping and statistical machines now coming into use more and more in office work. Their possibilities in the way of more accurate and far-reaching statistics and methods of keeping records have not been explored.

It is prophesied that the need of keeping pace with the modern trend in all industries will rapidly bring into the street railway industry more machinery and better methods. Looking back a few years, the question has often been asked: "How will those now receiving a better education than their parents be able to make a better living and be satisfied with their lot?" This view even brought about criticism of the education of all the children of the country. The question of "white-collar" jobs came up, and it appeared that men who had received some education would refuse to take up the ordinary work of trades, and insist on filling office positions, which caused a surplus of such workers, reacting in very low pay for these positions.

The very pressure of this condition has been a part of the need for and the development of machines. The machine seems to offer the only way out. It permits greater and greater production for the individual. He, in turn, secures a percentage of this production, which has the effect of constantly raising the real wages of the workman.

This is the way of modern progress and is the answer to the old question of what to do with those receiving a better education and desiring a higher scale of living.

It becomes a duty of men in managerial positions to seek constantly to bring into the organization more efficient machinery, and those who do not take up this challenge and keep pace with the modern trend will inevitably be left behind and cast off by the industry.

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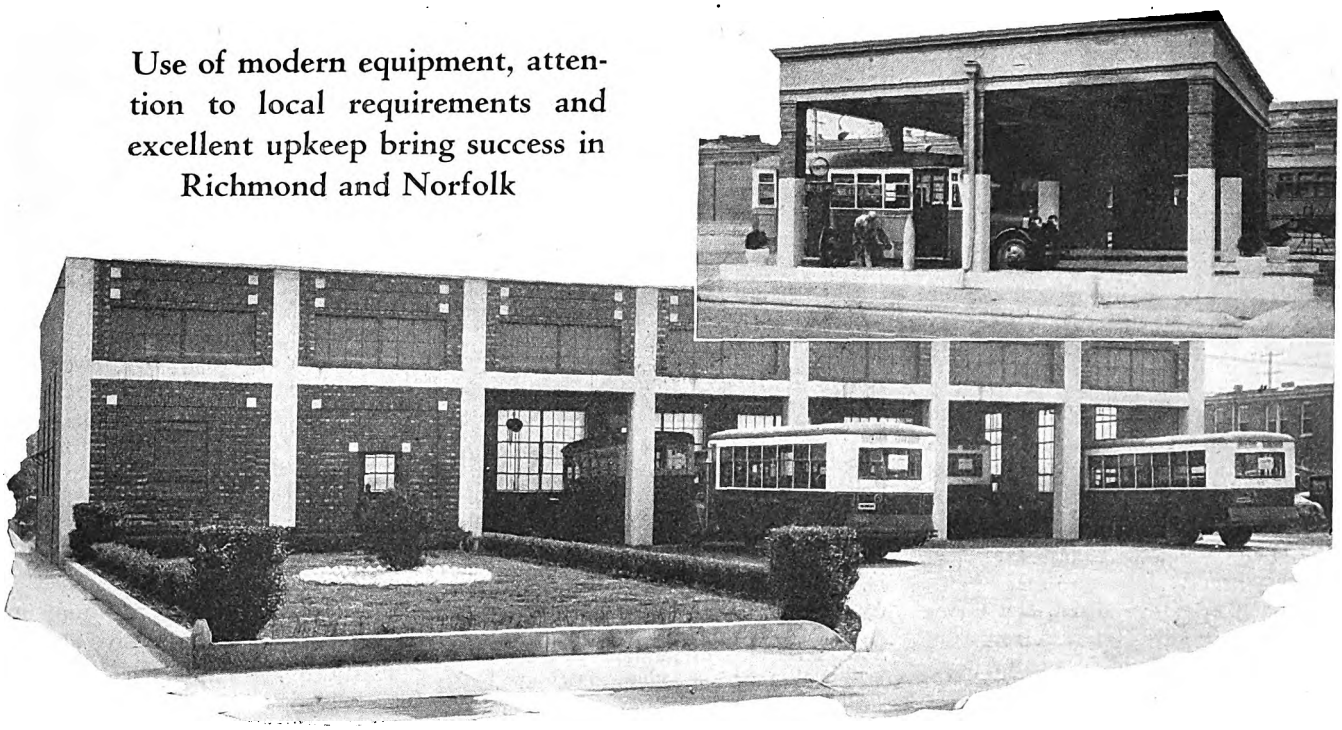
Buses Win on Merits in Virginia

Use of modern equipment, attention to local requirements and excellent upkeep bring success in Richmond and Norfolk



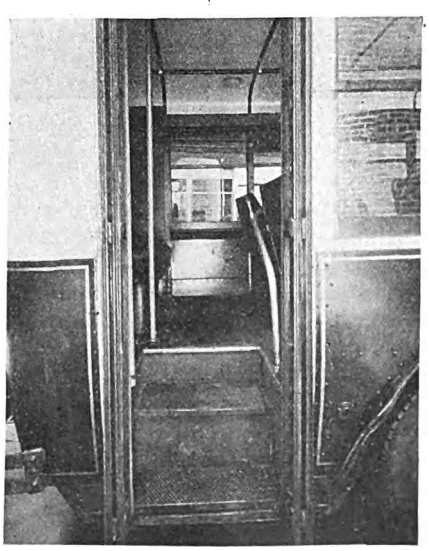
These views of a filling station and bus garage of the Virginia Electric & Power Company in Richmond tell without words the character of bus service given

BUS operation constitutes an important part of service given by the Virginia Electric & Power Company, the winner of the Coffin prize this year. In last week's issue particulars were given of the operating features and financial results of bus and car operation of the company in the four cities served—Richmond, Norfolk, Portsmouth and Petersburg. This week an account will be given of some of the notable features of the company's bus operation, as outlined in its brief for the Coffin prize. Later issues will contain similar notes on its track and shop practice.

From the accompanying illustrations of a filling station and bus garage in Richmond, belonging to the company, some idea will be obtained of the high standard now prevailing in the maintenance of motor buses. Buses are now regularly inspected every 1,000 miles. It has been found that the use of rubber blocks, originally placed under the springs as a preventive of rattle and wear, saves maintenance. Only four broken springs have occurred in the bus service of the company in more than 1,000,000 miles operation of rubber-block buses. As a result, the latest buses have still more rubber blocks.

Popularizing the One-Man Bus

To popularize the one-man bus, all of the larger buses have been equipped with treadle-operated side doors at the rear. This was an especially important matter in Virginia, where the practice followed, as in other Southern states, is for colored passengers to take the rear seats. The rear exit makes it easy for these passengers, who are already seated in the rear, to make use of the rear door for exit instead of brushing against the white passengers in the front end of the bus. At the same time, the interchange of passengers has been materially speeded up. The treadle step exit of this type of bus was made safer by adding stanchions and balustrade, as shown in one of the views.



Richmond improves bus exits by providing each rear treadle door with stanchions and balustrade

On the first fifteen treadle buses the door engines were mounted under the body with the levers placed so low that they were likely to be struck by high paving. These engines are now mounted in a housing directly under the cross-seat nearest the rear door.

Troubles from door failures have been practically eliminated, partly because of the indoor location of the engine and partly through the use of shorter levers. The new way is also more quiet.

Another improvement made by the company was in the method of heating buses. The type of heater usually supplied by the bus makers conducts the exhaust gases through heater pipes installed inside the bus. This practice involves the use of flexible pipe from the exhaust pipe connection to the heater pipes. When these flexible pipes corrode and break under vibration, noxious gases col-

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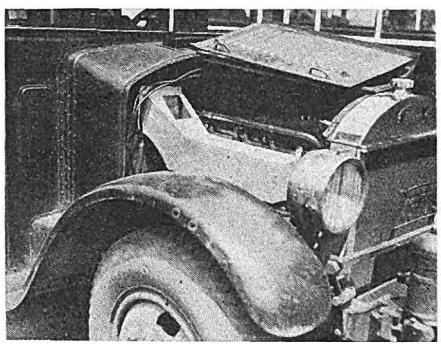
lect beneath the floor boards. The company has also found it difficult at times to keep the pipes gastight inside the bus. In some cases celluloid umbrella tips have ignited from contact with the heaters.

In attempting to solve the problem of heating buses, the management started on the basis that the ideal heat agent is fresh hot air. To get this without the use of exhaust gases and pipes a heater of the exhaust manifold stove type was installed on many buses. A sheet-steel hood is carried from the front of the manifold to the back, where it enters directly into the dash. The front of the hood is open and adjacent to the fan, so that air is blown directly through into the bus from a point where it is picked up fresh and clean. Since the manifold is the hottest part of the exhaust system, the forcing of air over it provides the bus with all the heat required.

All that is necessary to make the heater operative is to open the trapdoor in the dash. The door swings upward from a top pivoted joint and closes an opening in the top of the heater hood. Hot air then passes directly into the bus. With the dash opening closed, the opening in the hood provides circulation through it, and prevents overheating of the manifold. These heaters



Sheet-steel hood in position on manifold through which the radiator fan blows hot air into the dash of the bus

cost, installed, about $7 each, and their construction is shown in an accompanying illustration.

Change of Carburetor Location on Engine Improves Starting and Saves Gas

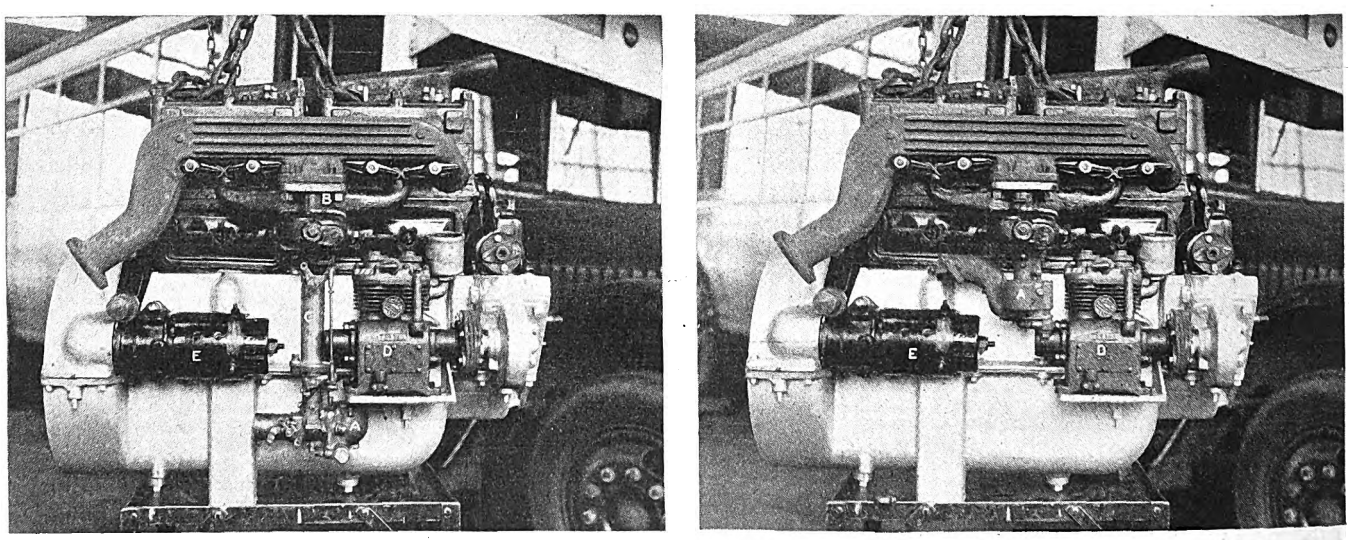
A style of bus with block type of engine, used by the company, gave trouble in warming up and in the maintenance of the proper adjustment on the carburetors. Both drivers and mechanics said the engines were "cold natured." The drivers complained that they could not get the bus away after taking on and discharging passengers. This made it difficult for them to maintain regular schedules.

The engine had been put together as shown in the picture at the left illustrating this point. The carburetor *A* was located 10 in. below the intake manifold *B* on a piece of aluminum pipe *C*. The absence of insulation or cover of any kind caused the intake gases to become chilled before they reached the main manifold. The principal reason for this arrangement was that the carburetor would not fit into the space between air compressor *D* and the starting motor *E*. To correct this, a carburetor was secured with an offset body *A*, as shown in the picture at the right. This fitted perfectly into the small space between the air compressor *D* and the starting motor *E*. This change permitted the elimination of the 10-in. length of aluminum pipe *C* (shown in the left-hand view), the carburetor float level thus being raised 13¼ in. above the old position.

Following these changes the buses maintained their schedules more satisfactorily, and the average miles per gallon of gasoline have increased from 4.5 to 5.67, a net gain of 1.17 miles for every gallon of gasoline consumed.

Change to Eradicate Transmission Failures

One type of bus suffered chronic failure of transmissions. Nearly always the breakage of the unit in question ruined an expensive aluminum transmission case and crippled the bus. Analysis disclosed that in



The slow starting of a block type engine was remedied and the gasoline consumption reduced by raising the carburetor

all cases the countershaft had broken and that the breakage occurred at the same part of the shaft.

It was pointed out to the manufacturer that the fault lay, first, in the fact that when the shaft was cut down to gear hub dimensions the point of breakage was fitted with a square shoulder instead of a fillet; and, second, too deep a keyway was carried through this point.

The trouble was corrected by providing a long radius fillet to eliminate local vibration stresses, and using two round-ended keyways with a different ratio of depth to width, where previously there was one keyway. The improved shaft is now standard with the manufacturer.

Servicing of Buses Also Improved

Improvements were not confined to the buses themselves. Many important changes were made at the

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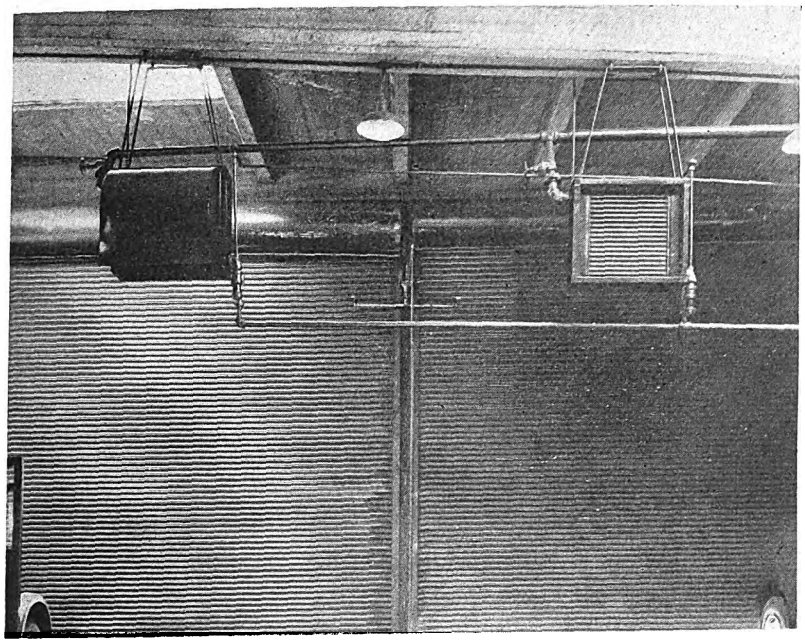
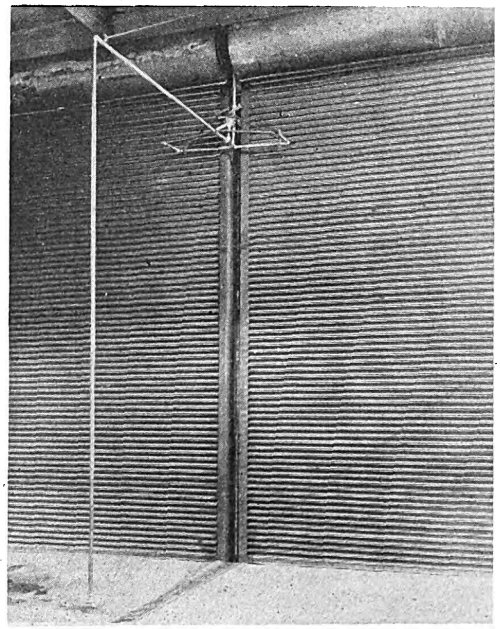




At left, steam radiator with fan connection in Richmond garage. The shield shown on the radiator at the left deflects the warm air to the floor. At right, swivel pipe for filling radiators with water. It can serve an area of 20 ft. radius

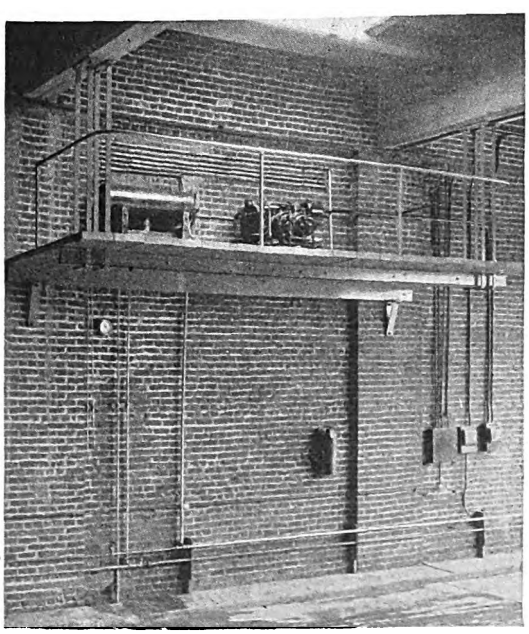
garages to make them more comfortable places in which to work and to simplify the servicing of the buses. Thus, an accompanying illustration shows the heating system used in the company's Richmond garage and comprising steam radiators with electric fans to drive out the warm air. The radiator at the left has a home-designed metal shield to deflect the warm air toward the floor.

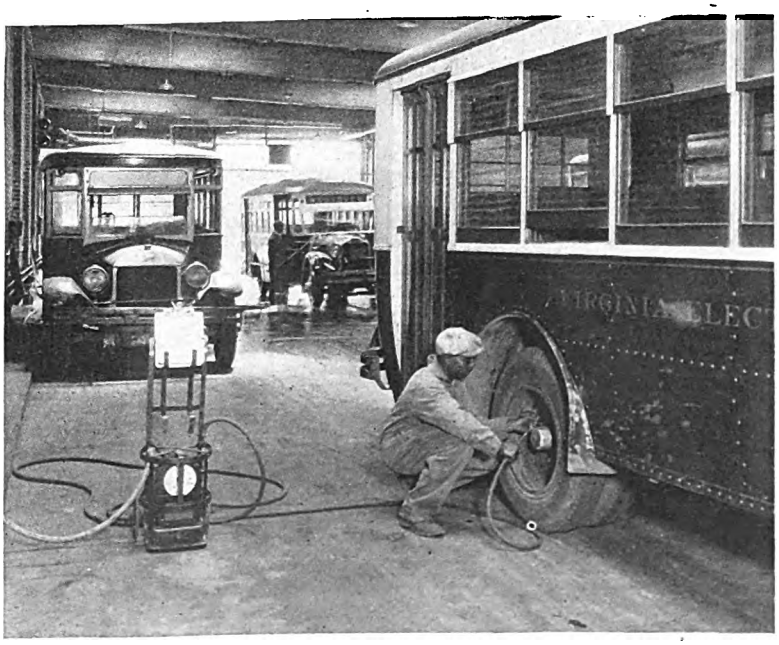
Another view shows the apparatus used in the same garage for filling bus radiators with water. The horizontal pipe, to which the rubber hose is attached, works in a swivel joint at the end nearest the rolling steel door. With this joint as a center, the pipe can be rotated horizontally to serve any bus within a radius of 20 ft.

The pipe and hose are brought back to the position shown by means of two coil springs. On the end of each spring is attached the movable pipe; the other end is fastened to a stationary pipe frame. To relieve any possible strain the horizontal pipe is supported by a guy rod which can move with the pipe.

Tire inflation time was cut more than half, or from 19 to 8½ minutes by means of an air compressor and tire inflater. The compressor is mounted on a platform 12 ft. above the floor to conserve floor space and to be free from tampering and excessive dust. It is of the high-pressure type with a water governor which cuts out at 160 lb. The air is piped from the two storage tanks, the entire length of both garages on each side of the building for 626 ft. to give a full supply at any location en route.

Tire inflation is effected with an "Eco" tire inflater, installed on a home-made carriage. It is connected between the main air supply and the bus tire to tell the tireman when the tire is properly inflated. All that the tireman has to do is to set the dial for the desired pressure.





Tire inflation is almost automatic in Richmond. The view at the left shows the motor-compressor and one tank

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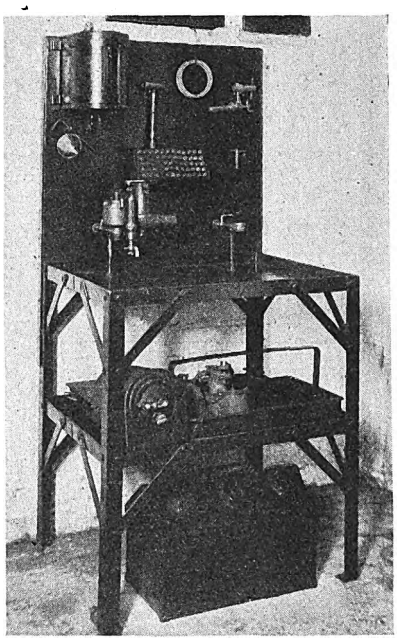
A bell in this instrument rings intermittently until the required pressure is reached.

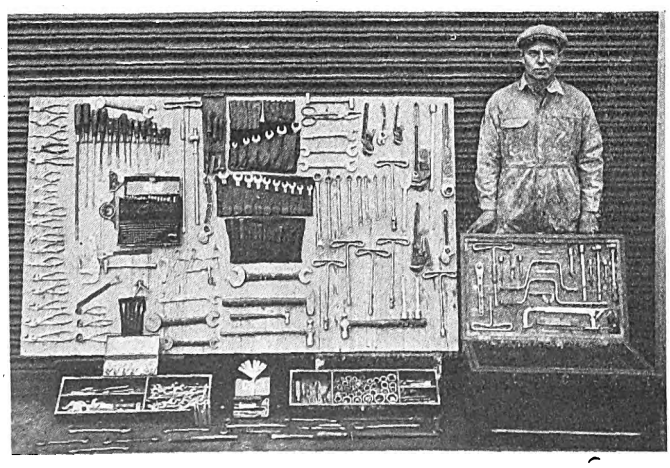
Many time-saving repair methods are used. A full complement of equipment is provided for this purpose. An interesting illustration of the design of special equipment for repair work is a carburetor testing stand with which proper level, flow of gas, leaky gaskets, etc., can be given practically the the same test as on the engine. The stand has a vacuum tank, as shown in the upper left-hand corner of the picture, supplying the gasoline for testing. All gas lines are on the rear of the instrument board. Extra carburetor jets are carried on a wooden container block with 60 receptacles for the different sizes and types of jets. Formerly, the jets were carried loose in a box, but this meant a great deal of searching before the right jet was found. The jets would thus become scratched and scarred, with dirt gathering in the ports to keep them from functioning properly.



Carburetor testing set for checking flow of gas, leaky gaskets, etc.

The final practice of the company in its bus maintenance, selected for illustration and comment here, is one of the methods followed to encourage pride in workmanship in the repair garage. This is to provide that every mechanic has his own tool kit. There is no borrowing or lending of tools in the garages of the company. Each man takes pride in the fact that his personal kit contains the proper tools for any job that he may be called upon to handle.

A special room equipped with racks is provided in the Richmond garage of the company to store eighteen tool kits valued at $7,000. The least valuable of these kits, one which belongs to the junior member of the force, is valued at $100. The most elaborate kit actually cost $700.



Every bus mechanic takes pride in perfect work because every tool is his own

Railway at St. Joseph 40 Years Old

THE electric railway of the St. Joseph Railway, Light, Heat & Power Company, began operations in 1888, soon after the famous road in Richmond, Va., was opened, and so is 40 years old this year. Like the Richmond road it has been in continuous operation, though the original electrical division has been extended many times. An interesting article about the line, with dates, and about earlier electric railways, appears in the September issue of the company's publication *Rylite Employees News*.

The Readers' Forum

Preservative-Treated Timbers and Ties Give Long Service

CLEVELAND RAILWAY
CLEVELAND, OHIO, Oct. 1, 1928.

To the Editor:

For a number of years the writer has from time to time contributed short articles dealing with the advantages of preservative treatment of timber in an effort to bring home to the electric railway executives and engineers the economies of the problem.

During the past month there appeared in the *Engineering News-Record* two articles bearing on this subject, which I feel sure are of sufficient interest to justify calling specific attention to them.

In the issue of Sept. 6 there appeared a very interesting description of a railroad trestle constructed with creosoted yellow pine timber by the Southern Railway over a part of Lake Ponchartrain in 1883 and still in service after 45 years. Particular attention is called to the result of strength tests on timber taken from this trestle in comparison with similar tests on newly treated timber of the same general characteristics, the comparison being very favorable.

In the issue of Sept. 27 there appeared an abstract from the report of the Forest Service, U. S. Department of Agriculture, relative to the increase in the use of preservative treatment for railway ties. This showed a total of 74,231,840 railway ties treated during the year 1927, an increase of nearly 18.5 per cent over 1926. Of course, the bulk of these treated ties were for steam railroads, but this does not detract in the least from the value of the story which these statistics tell.

Data recently have been presented from New Orleans showing rail replacement on creosoted ties which had been in service 21 years and still in an excellent state of preservation. From Atlanta, we have records of creosoted ties still sound after 31 years of service and corresponding long-life records from still other points.

When the writer has made the statement that 31 years life could reasonably be expected from pressure-treated wood ties in street railway track in paved streets, he has noted occasional tendency on the part of individuals concerned to scoff at the idea. The above records substantiate fully his claims, and there are undoubtedly many instances not on public record where these experiences have been duplicated or even bettered. They tell a story which no management can afford to ignore.

HOWARD H. GEORGE,
Superintendent of Research.

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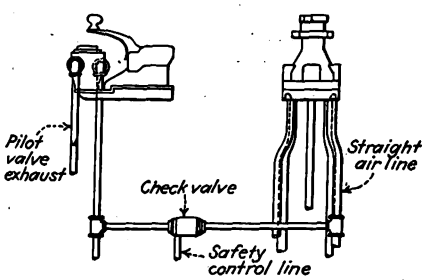
Maintenance Methods and Devices

Improved Safety Device Mechanism

By H. C. Pressler
Master Mechanic
Eastern Texas Electric Company,
Beaumont, Tex.

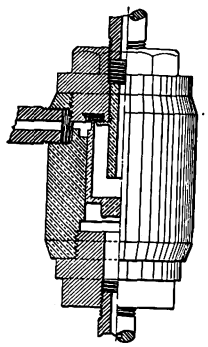
SOME troubles were experienced with the safety control equipment used by this company, due to leaks and difficulty of operator in holding down the foot valve. As a result a new pilot-valve operating mechanism and check-valve arrangement were designed in the shops of the Eastern Texas Electric Company, Beaumont, Tex. Accompanying illustrations show the design. The foot-valve



Connections to check valve and pilot valve

mechanism has an arm extending up wards with a spring attachment to operate the pilot valve. The valve pedal does not tire the operator's foot. The cost of installing this equipment was $10 per car and previous troubles have been eliminated.

The check-valve arrangement is



Construction of check valves

placed in the line in order to prevent knocking out the overhead breakers when brakes are applied with the operator's hand off the control handle. The spring in the check valve holds the safety control line open until 30 lb. of air is in the brake cylinder. Then it closes and cuts off the safety control line.

High-Strength Soldering

COMMERCIAL high-strength solder used in railway work comes in three forms: (1) lead, tin and antimony, (2) cadmium-zinc, and (3) copper-zinc. The first melts at 300 deg. F., the second at 700 to 800 deg. F., and the third at 1,500 to 1,600 deg. F. In each the proportion of the metals used in making up the solder alloys may vary, with the result that these solders melt at a lower or higher temperature, with a corresponding decrease or increase or strength. Lead, tin and antimony solder has an approximate tensile strength of 4,000 lb. per square inch, cadmium-zinc solder of 15,000 lb. and copper-zinc solder of 30,000 to 40,000 lb. per square inch.

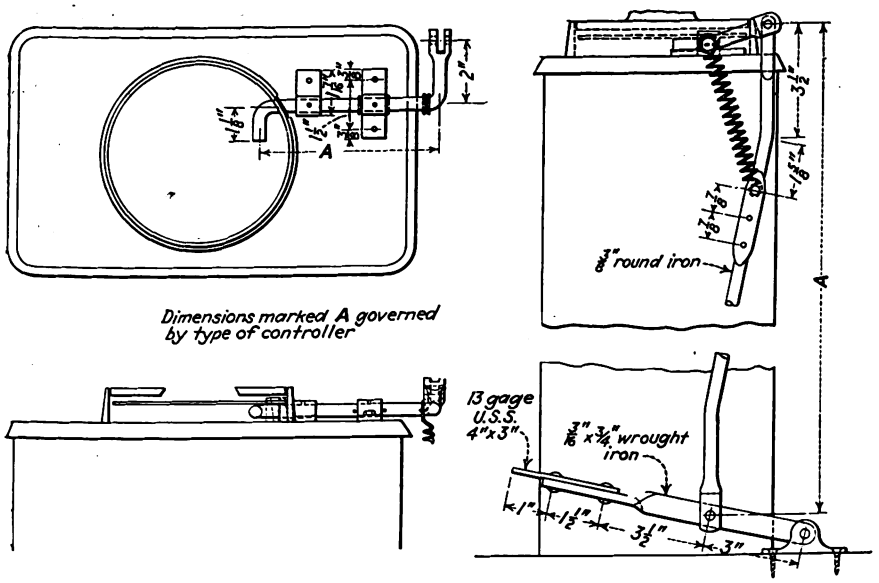
The use of these solders is based upon the principle that almost any metal will surface-alloy with another metal which melts at a higher temperature, provided the surface of the latter metal is chemically clean and is heated to a temperature corresponding to the melting point of the solder used. Where the base metal is maintained in contact with the molten solder at this correct heat for a period of several minutes, the extent of the penetration of the solder into the base metal is quite remarkable.

When bronze-welding cast, malleable and wrought iron, high and low carbon steels, copper, monel metal, aluminum-bronze and other metals and alloys that melt at a comparatively high temperature, it is necessary merely to have the weld areas clean and heated to a good red heat only. Then the Tobin bronze, manganese bronze or other filler rods, if melted upon these weld areas, will instantly effect a joint of very high strength.

The oxy-acetylene flame has been adopted largely as a source of heat for the application of these various solders because it possesses great advantages over the old-type soldering iron or copper. For some of this work the required heat can be furnished almost instantaneously, thus effecting a great saving in time and increasing speed in production.

The first chemical reaction in the burning of acetylene with oxygen is the production of carbon monoxide and hydrogen. The hydrogen, burning in the outer strata of the flame, envelops the molten solder and the heated weld area of the base metal, protecting them from the oxygen in the surrounding air. This enables a skilled operator to obtain practically the maximum strength of the solder used.

In the production of work where the high temperature required for welding might cause discoloration or coatings of oxides which would have to be removed before finishes could



Pilot valve operating mechanism

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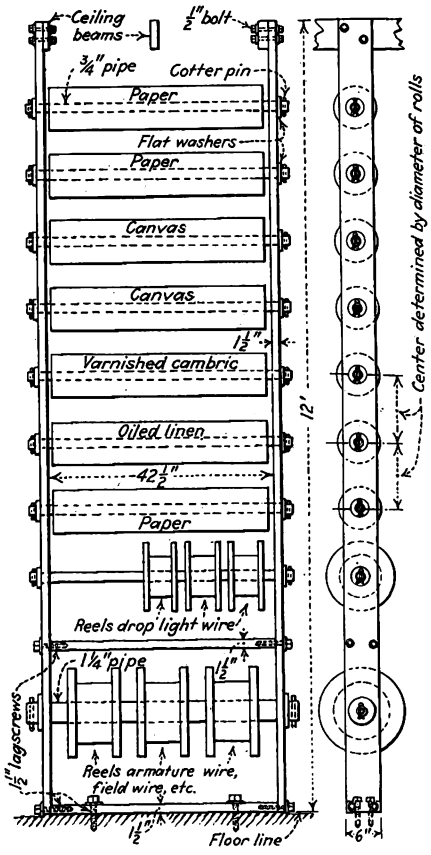
be attempted, joints can be made with the assistance of a fluxed solder. Then under the heat of an oxy-acetylene flame, the solder is observed to melt and spread, effecting a quick, clean weld, free from discoloration and desirable in every respect.

Small Storeroom Material Rack

CONSIDERABLE time is lost where material is not accessible in storerooms. The Richmond Railways, Inc., Staten Island, N. Y., has designed and installed the special rack shown in the accompanying sketch to obviate the waste of time. It is made of wood and occupies the small floor space of 45½x6 in. It is used for the storage of rolls of material such as paper, canvas, oiled linen,



Storage rack for wire and insulating material

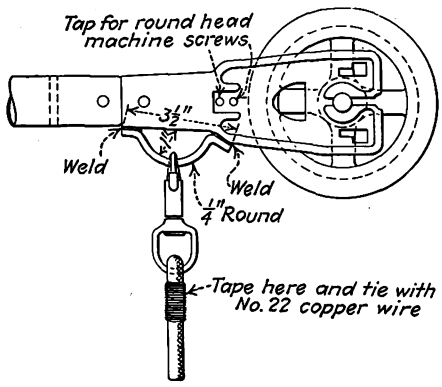
cambric and reels of wire. Two 1½x6-in. oak timbers spaced 42½ in. are bolted to the ceiling beams by ½-in. bolts and lagged to a 1½x6-in. oak beam fastened to the floor. The rack is 12 ft. high. It is designed to accommodate seven rolls of material and several reels of various kinds of wire. The reels and smaller rolls are supported on ¾-in. pipe installed in the uprights, whereas the heavier reels are carried on 1¼-in. pipe.

Snap Connection for Trolley Ropes*

By Charles Herms

General Foreman San Diego Electric Railway, San Diego, Cal.

CHANGING of trolley ropes or poles quickly without losing time in opening knots or cutting the rope has been made possible on the lines of the San Diego Electric Railway, San Diego, Cal., by using a harness snap at the end of the trolley rope In order to make it possible to fasten the snap to the trolley harps a piece



Method of attaching trolley rope and shunts to harps on the San Diego Electric Railway

of ¼-in. round iron is welded into position to form an eye, as shown in the accompanying illustration. The trolley rope is passed through the eye end of the snap and doubled back for a distance of about 3 in. This is wrapped with several turns of friction tape, and over this about fifteen or twenty turns of No. 22 gage bare or enameled wire. This protection overcomes danger of rope being burned and appears neat.

Another improvement on trolley harps which is used on the San Diego cars is in the use of collector brushes which fit the sides of the harps. These originally were riveted in place, but as it frequently is necessary to remove them for replacement they are now fastened by machine screws through holes drilled and tapped in the harp. Replacement then can be made quickly and as a result these shunts are kept in much better condition.

Checking a Water-Soaked Armature

WHEN armatures have been flooded and it becomes necessary to dry them out in an oven, a voltmeter indication may be very misleading unless checked with a lamp test circuit at operating voltage. A week or more may be required to boil all of the water out of an armature, and during this entire period a voltmeter will appear to indicate a dead short-circuit. The meter deflection observed may not actually be full line voltage, but it is so near that on a fluctuating voltage circuit, the man conducting the test will be unable to note the difference. When a meter indicates a dead short, the indication should be checked with the lamp test. If there is no metallic short, the lamps will burn perceptibly brighter when the test points are touched together than when the insulation is included in the test circuit.

The conclusiveness of any test made on the insulation of an armature depends somewhat on the testing means available, and on the testing methods adopted. A voltmeter test at 110 volts may pass insulation that a meter test at 600 volts would condemn. A bell circuit test of a few volts may pass insulation that a 110-volt test would find defective. Low voltage tests appear to indicate only the existing actual conditions of the insulation, and are unable to indicate weaknesses that might be considered on the verge of breaking down. For this reason, armatures should be subjected to at least the voltages at which they are to be operated, and it is customary to use voltages of about three times the rated operating voltage.

*Submitted in Electric Railway Journal Prize Contest.

New Equipment Available

Track Oiler and Spraying Machine

FOR oiling rail joints or the entire track structure or spraying the roadbed, a new track oiler and spraying machine is announced by O. F. Jordan Company, East Chicago, Ind. The machine is self-propelled, and is built strongly and ruggedly to withstand the severe railway operating conditions.

The wheels, of 24 in. diameter, are mounted on heat-treated axles which turn on roller bearings. The drive from the engine to each axle is by means of roller chain and sprockets through a heavy-duty three-speed selective transmission and special reverse gear. This allows three speeds in either direction. All speeds are

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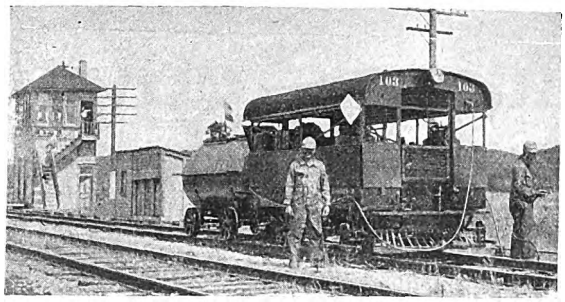
regulated automatically. Brakes are supplied by the Westinghouse Air Brake Company. All controls, meters, gages and levers are placed conveniently to permit of one-man operation. An aluminum oil heater warms the oil with exhaust gas from the engine. Accessories include electric starter, storage battery, electric head and tail lamps, and electric warning signal.



Automatic track oiler and spraying machine, in use on the lines of the Chicago & Northwestern Railroad

In the valve control of the oil flow, solenoid coils are required to work in an oil bath subjected to temperatures as high as 150 deg. F. Bakelite tubes and washers are used as insulation surrounding the coils.

The oiler resembles a miniature engine. One operator, one pilot and two laborers can handle all oiling required on 30 to 50 miles of single track per eight-hour day under ordinary traffic conditions. When oiling joints only, the machine can be handled by one man. In addition to the oiling of joints the Jordan track oiler and spraying machine will oil the entire track including all tie plates, spikes, joints, anchors, etc. at a speed of 25 m.p.h.

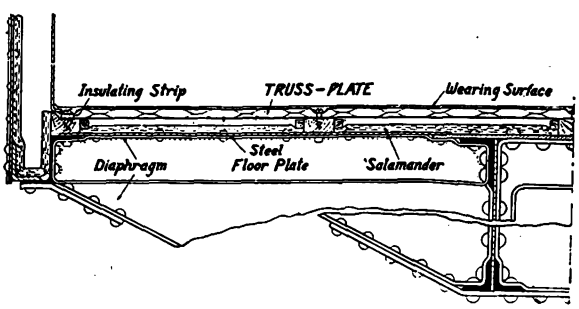
Two specially constructed oil spray guns with 40 ft. of hose provide means for oiling all switches, switch stands, frogs, derails, crossings, interlockers, drawbridge mechanism, etc. The special oil spray guns are constructed so that any adjustment from a fine needle stream to a large cone spray can be used. With the large spray station ground platforms, highway crossings or other places can be oiled. The machine is particularly convenient for weed killing.

Light-Weight Floor Material

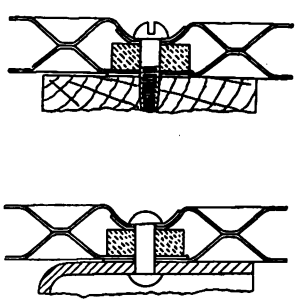
A NEW floor material consisting of a combination of truss plate and Masticoke is announced by the Johns-Manville Corporation, New York, N. Y. Truss plate is made of two sheets of No. 22 USS gage steel in which staggered rows of oval cones have been pressed. The two sheets are placed so that they can be riveted or welded together through the tops of the cones. Truss plate is made of copper bearing steel to retard corrosion. The finished material is coated inside and out with Elaterite which is a rust-proofing paint for steel and protects the underside and provides a bond for the surfacing material.

Masticoke is an asphalt composition wearing surface and is very light in weight. While truss plate itself weighs more than other types of steel car sub-flooring, the finished car flooring weighs much less. This is made possible due to the construction of truss plate. The mechanical strength makes a $\frac{3}{8}$ or $\frac{1}{2}$ in. wearing surface practical, whereas other floor structures rely on a thicker wearing surface for strength.

Truss plate weighs 2.5 lb. per square foot. Masticoke weighs 1 lb. per square foot per $\frac{1}{8}$ in. thickness. In practice a $\frac{3}{8}$ in. wearing surface is recommended so that the total weight of the complete structure is 5.5 lb. per square foot. Compared with other types of car flooring, this effects a saving of from 2 to $3\frac{1}{2}$ lb. per square foot.



Longitudinal section showing construction of car underframe



Type of joints. Above, screw joint; below, rivet joint

Truss plate is made 30 in. wide by any convenient length up to a maximum of 144 in. The over-all thickness of the plate is $\frac{7}{8}$ in. The cones or depressions measure $3\frac{1}{2}$x$1\frac{3}{8}$ in. at the base and are arranged in alternate rows of six and seven each. This allows the depressions to overlap slightly. The rows are spaced on $2\frac{1}{2}$ in. centers, both longitudinally and transversely. The distance from the center of the outside row to the edge of the plate is 2 in., leaving a flat margin of $1\frac{5}{16}$ in. for splicing the plates together. At the ends the distance is $3\frac{1}{4}$ in., leaving a flat margin of $1\frac{1}{2}$ in.

This type of flooring may be applied to the underframe car construction either where the heavy steel plate floor is used or where this plate is eliminated. Where the steel plate floor is used, the plate itself is applied in the usual manner, and nailing strips are then fastened to the steel floor plates transversely on the car at intervals equal to the width of the truss plate. Truss plates are then laid across the car, the side edges coming above the transverse nailing strips. Longitudinal nailing strips should be used over the side sills and may be used at intermediate points if desired.

Where the heavy plate is not used, truss plates are secured directly to the center, side and transverse sills. The transverse sills should, if possible, be placed so that the joints of the truss plates rest on them.

Truss plates are joined together by inserting a filler strip of insulating material between the top and bottom side margins. This strip may be of hard wood when bolts or screws are used, but should be of asbestos when hot rivets are used. Wood strips should be $\frac{7}{16}$ in. thick and asbestos strips $\frac{1}{2}$ in. thick. The truss plate that holds the filler strip is then inserted into the margin of the adjoining truss plate. The distance that the plates overlap should never be less than $1\frac{1}{4}$ in.

After the margins have been overlapped with the filler strip between them, the margins of the two top sheets should be concaved until they touch the filler strip. This is done to stiffen the margin of the top sheet and to prevent bolts or rivets from protruding above the surface of the plates. The end margins are treated in the same way.

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Association Activities

Accident Prevention Through Interdepartmental Co-operation*

By John J. Reynolds
Claims Attorney Boston Elevated Railway, Boston, Mass.

THIS subject is a particularly timely one because of the industrial accident problem and the workmen's compensation cost that the railways are seriously facing today. The tragedy of preventable accidents has been like a huge shadow obstructing the sun. The heavy toll demanded by this common enemy is the price of carelessness. In spite of all the work that has been done, in spite of all the money its prosecution has cost, in spite of all that has been done to focus public attention upon this awful toll in human life and suffering, it continues to sweep through the country and the industries like a sand storm, leaving in its wake a deplorable human wreckage. In spite of all the efforts that have been made to create a conception of its staggering economic waste, a survey of current accident history makes one pause and ask, What curious impulse is it that causes men to be careless?

It must be admitted that for the length of time in which workmen's compensation has been in operation in the United States, and for the length of time in which intensive accident prevention work has been going on, we have achieved really remarkable results. Since the tendency is toward liberalization of benefits, however, it is manifestly important that there shall be no let up in either activity or intensity to reduce accidents to an irreducible minimum.

Departmental Dependence

Now to discuss briefly the question of departmental dependence. The first fact to be considered is, shall we interpret it as a term of limitation or of extension? We have elected to treat it in a broad or comprehensive sense, since departmental action has an influence on human life beyond department limits, even when such department is not consciously aware of this influence. It excludes the idea of any logical halting place between a thoroughgoing spirit of earnestness and a thoroughgoing feeling of interest. Where obstacles in the road of progress cannot be surmounted, they must be removed. Departmental efficiency is clearly influenced by the number and seriousness of its failures and accidents.

While the performances of each department is measured largely by the results it achieves, they are not in any practical sense isolated departments, and failures or accidents in one frequently are but the beginning of a train of events which affect other parts of the organization. Departments function only through individuals who represent them. Too often some employees seem not to have had a proper appreciation of the fact that the good will and success of the railway is built up or destroyed through their actions, their failure to act, their failure to co-operate, just as much as through failure of the management itself.

The policies of all departments may properly be said to have the same general objectives, hence they should be formulated with a view to protecting not only the interests of each department, but of the whole organization. To get the best results in our efforts toward this 100 per cent interest, it is fundamentally important that there should be as few individual differences as possible in the interest of employees, not only in their own special job but in the general business welfare and success of the employer, too. Should there be a tendency toward the development of a departmental, as distinguished from an interdepartmental outlook, then obviously it is not conducive to the best interests of the organization as a whole, in that there is then the danger that it will result in taking a restricted view of the railway's interests.

Department Heads Must Lead

Heads of departments, superintendents, foremen, and other supervisory officers have in all probability been selected because of special skill which has been acquired, no doubt, through long experience in their particular field. Their training has tended to give them a broad outlook, thus giving them special knowledge upon which to base an appeal for constructive interest. This is particularly true of foremen, inspectors and other supervisory officers, because they ordinarily spend a good part of each day among the workmen, and in that way are able to keep in close touch with, and informed of conditions and tendencies of employees. These close contacts place them in a position where they can be of great service in developing this spirit of interest, and if they are awake to their opportunities, may often make suggestions which will result in spreading this interest to other departments.

Employee Attitude Important

The question of the attitude of the individual department employee is too important to be left entirely to chance and his own discretion. It is of grave concern to the railway, and if proper control is to be exercised and systematic interest secured toward the elimination of accidents, the policy defining these relations should be thoughtfully conceived and consistently applied. Only by such means can a uniformly high standard of performance be hoped for.

Interdepartmental interest and coordination is the road to profitable operation of the railway as a whole. It is of no avail to save a minute here or a dollar there in machine work or assembly, if that saving is lost in slow interdepartmental appreciation of the cost of preventable accidents, which not only waste time and lower production, but gnaws at the very vitals of the railway revenue. Every executive, each department head, superintendent, foreman and employee owes it to himself and to his company, to get the facts on what is being done in his department to prevent

Abstract of a paper presented at the Seventeenth Annual Safety Congress, New York, N. Y., Oct. 1-5, 1928.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Oct. 17-19 **— Society Automotive Engineers, national transportation meeting, Newark, N. J.**

Oct. 24-25**—Public Utilities Association of West Virginia, annual meeting, Huntington, W. Va.**

Oct. 29-31**—American Institute of Electrical Engineers, first regional meeting of the Southern District, Atlanta, Ga.**

Nov. 7-8**—Iowa Electric Railway Association, operating meeting, Roosevelt Hotel, Cedar Rapids, Iowa.**

Nov. 13-16**—National Association of Railroad and Utilities Commissioners, New Orleans, La.**

Nov. 21-22**—Public Utilities Association of Virginia, Hotel Roanoke, Roanoke, Va.**

Jan. 14-18, 1929**—American Road Builders' Association, convention and road show, Cleveland, Ohio.**

Jan. 23-25, 1929**—Electric Railway Association of Equipment Men, Southern Properties, Houston, Tex.**

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accidents, and contribute what he can from his experience toward their complete elimination.

Probably no one thing in railway department operation is more important than the safety of employees. That more will be accomplished for the prevention of accidents by educational methods than through any other means is an accepted fact. But we must not overlook the further fact, that this presupposes that the railway itself has done everything reasonably practicable to make the place of work safe, both physically and mechanically.

Another thing to be considered in any movement looking toward accident prevention, is the necessity of having a prompt and full report of an accident, since a systematic compilation of accident records is the foundation of a well organized accident prevention. Therefore, it is imperative to have an adequate system of reporting accidents, a proper method of analyzing and classifying them, and a workable plan of co-ordinating the accident activities of the different departments for purposes of effective prevention. Maximum success in accident prevention work necessitates tabulations of accidents that will show who, and what, was responsible for each accident, all leading to the formulation and administration of definite plans for prevention.

Still another important thing in our work for accident prevention is to have a "fact-finding body." This has been found to be of great help in reducing accidents, in that it has developed both individual interest and organization efficiency. It is therefore obvious that to do the best work for prevention there should be such an agency, which may consist of a committee of employers, and a committee of employees, or outside experts in personnel work, but preferably the three agencies sympathetically co-operating. The scope of the activities of this agency should at least cover the working conditions, the health, the accident problems of the different departments, for they are the base of regularity and decreased labor turnover, and also because they may mean contentment, as well as the elimination of fatigue and worry, the latter being now a well recognized cause of accidents.

Educational Aids Are Necessary

No matter what may be said to the contrary, the history of the accident prevention movement testifies without exception in any state, that the attempt to secure even an approximate reduction of accidents without invoking educational aids and methods is foredoomed almost to complete failure. Nowhere has it succeeded, nowhere can it succeed without the help of these important factors. So, as a final conclusion drawn from this fact, it may be stated that any scheme directed to secure interdepartmental co-operation in preventing accidents should have its base in educational effort.

The educational program must be designed to meet the needs of all concerned, and when so designed it results in harmonizing the interests of all departments and their employees, and hence promotes better interdepartment interest and safety. Department heads should be held responsible for the workers' safety; therefore it follows that a high accident rate should count against the promotion of any executive or sub-executive as it indicates his failure properly to educate the men under him.

Management and employees—efficient, willing, intelligent, interested, both on their toes in reciprocal relationships—working with each other and together with dignity and integrity, and in a spirit of mutual helpfulness, and for the promotion of the best interests of the railway: those are the factors which tend to promote and sustain constructive and safe interdepartmental activity, and in outline is what we understand co-operation to mean.

Learn to count men among your assets. It is their brains, their alert minds, their eyes, their hands, their efficient operation remaining throughout the working-day, which permits you to lower the cost of running your departments, and hence increase the net revenue. Therefore, have an open mind—don't disregard, without giving it fair and full consideration, a suggestion made by an employee for the safe conduct or economic operation of your department. When necessary, be big enough to put aside the defense mechanism, by which the mind seeks to expel or repress unwelcome ideas.

A responsive stimulus to interdepartmental co-operation in accident prevention is the appeal to departmental pride to have: (1) The longest no accident record, and (2) the best record for the number of hours worked without a lost time accident. The personal impressions of railway employees, their likes and dislikes, their naturally favorable reaction to a sense of fair treatment, and their feelings of resentment and their desire to retaliate in the face of sharp practice, all are bound to color their actions. Their personal equation is ever to be reckoned with in business, for no matter how utilitarian or impersonal the organization may seem, it derives its character and tone from the personalities of individuals.

The accident problem, in spite of all the changes that have come about, is still the same old problem. One need but study its history to be satisfied of this. Take but a cursory view of the marvels of modern mechanics, of modern maintenance methods, of the ingenious and useful devices and contrivances designed for and intended to solve this problem and then remember that with safety incorporated in the design, construction and installation of industrial equipment, it is possible to prevent only about 25 per cent of industrial accidents through mechanical means, and that for the prevention of the rest, we must turn to educational methods, better supervision and improved morale of employees. One may then realize why the solution of our problem depends so much upon education and the creation of a constant spirit of co-operative safety—why it is necessary to have the fullest possible co-operation between the several departments of the railway, all co-ordinating to stamp out thoughtlessness and carelessness.

Overcoming Transportation Hazards*

By D. L. Fennell

General Superintendent Transportation Kansas City Public Service Company Kansas City, Mo.

ORGANIZED accident prevention work on the part of electric railways was almost unknown fifteen years ago. Today, however, all wide-awake electric railway managements are carrying on accident prevention campaigns. That the safety work of the city electric railways has been successful is, I believe, conclusively shown by the fact that in 1912 there were approximately 3,000 fatalities in street railway operation, and only 1,661, according to National Safety Council figures, during 1927. Of the 1,661 fatalities in street railway operation during the past year, 500 occurred in collisions with automobiles or trucks, thus reducing to 1,161 those attributable to other causes. This decrease resulted despite the fact that railway speeds have been materially increased to meet popular demand and competition of motor-driven vehicles.

There are some properties much more advanced than we in Kansas City in accident work, but the results that we have obtained have, in my opinion, been so successful as to be worthy of your consideration. Fifteen to eighteen years ago neither the operating officials nor the trainmen in Kansas City were greatly concerned with accident prevention, although men were disciplined if, in the opinion of officials, accidents occurred due to gross carelessness. Today an entirely different situation exists, and it might be of interest to know how this change has been brought about.

It was necessary before any comprehensive plan for accident reduction was put into effect, to make a study as to where and how accidents occurred. An addition was made to the general transportation force in the way of a statistical clerk, who compiled data of all accidents occurring over a long period of years, and made careful analyses and comparisons. The next step was to secure active co-operation of division operating officials, which was done through meetings of an educational nature, explaining the need for intensive work throughout the entire transportation organization. Having information as to facts, the division and general

*Abstract of a paper presented at Seventeenth Annual Safety Congress, New York, N. Y., Oct. 1-5, 1928.

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transportation officials next carried the problem to those who actually operate the cars, the trainmen. In a series of meetings held at the various divisions, the men were given an outline of accident conditions, data as to number occurring, cost, etc., and their co-operation solicited towards obtaining the desired reduction and improvement.

Analyses developed an excessive number of so-called boarding and alighting accident; apparently caused by persons attempting to get on or off cars while in motion. As an aid in improving conditions the management equipped all cars with folding doors and steps, thus doing away with open platforms. The mechanical department co-operated by putting into effect a much more thorough system of inspection and maintenance of equipment. This has been a most important factor in reducing accidents. With this assistance from the mechanical department, it was found that car operators were much more interested in reporting defects in equipment, which heretofore they had been prone to neglect.

Railway Co-operates With Local Safety Council

Through the activities of the traffic committee of the Safety Council, much has been accomplished in the way of improving operating conditions, through reduction of traffic congestion. The personnel of this committee consists of representatives of several industries and has the respect of the general public and newspapers.

The traffic committee of the Safety Council is called on by the City Council to make recommendations on all ordinances affecting traffic, and while there is still much unaccomplished, conditions have been materially improved. Traffic problems in general are handled also through this division of the Safety Council. Accident prevention work among the thousands of school children is another part of the council's activity and has been an invaluable aid in our efforts to overcome transportation hazards.

Last December, on recommendation of the traffic committee, the police commissioners put into effect pedestrian control at all downtown intersections where traffic officers are stationed, which has materially speeded up our operation at these intersections and reduced the possibility of collisions with pedestrians. Some few streets used by our cars have been made arterial or stop streets, and this has resulted in fewer collisions with vehicles crossing the tracks. Safety zones have been installed at all car stops in the business district and at many outlying points. With vehicles prohibited from driving on track through safety zones, a marked reduction in collisions with automobiles and trucks has been obtained. Yellow lines on pavement marking overhang of cars, have been placed at many locations where our studies found that accidents to vehicles and pedestrians being struck by rear end of car had previously occurred. This class of accidents has been almost eliminated at such locations.

Within the past few years a much more careful selection has been made in the employment of men as car operators. After filling out a preliminary application, the applicant is given an inspection to determine fitness for work and then must pass a rigid physical examination before being turned over to the instruction department. Three days are spent in the instruction school, prior to actual road instruction, and where some fifteen years ago a man was considered competent to operate a car with one week's instruction, our present training period is from 21 days at the smaller divisions, to 30 days at the larger ones. During his first seven days of operation alone, a man is checked daily by a representative from the instruction department, and for a period of 90 days is followed up on an average of once a week by a traveling instructor. A careful record is kept in a card index system in the instruction department.

All accidents are carefully investigated by the division superintendent or his assistant, and the man concerned interviewed the day that accident occurs. Division superintendents send in a written statement, made out in duplicate, one copy of which is sent to the adjustment department and the other being filed in the operator's record. Twice yearly the division officials compile accident records of car operators, and a man is called in personally by the division superintendent and commended if he has a good record, or advised as to improvement necessary.

To keep the trainmen fully advised as to results a daily system of bulletins was inaugurated, showing in chart form the number of accidents, a general classification of those chargeable to each division, and explanation as to the number apparently avoidable and how some could have been prevented. These bulletins are posted at divisions not later than noon of the day following, and although this system has been in effect for many years we find the men still greatly interested.

We have never tried the bonus system in effect on some properties, but as an incentive towards improvement and to create rivalry among divisions, an accident table was worked out by operating officials and the general transportation committee. Under this plan accidents are divided into five major classes and a certain number of points are allowed for the best record in each class, according to the importance of that particular type of accident. Points also are awarded for the greatest percentage of improvement over the month previous and over the same month for the year previous. All accident comparisons are made on a basis of car-miles operated, or 1,000,000 passengers carried. A prize of $50 per month is awarded to the division making the best record and a $25 prize to the division next in line. A $25 prize is also given to the motor coach division making the best record. The division making the best record for the year in accordance with this schedule, is given a banquet or outing, and a trophy to display at its headquarters.

In competitions of this kind there is usually a tendency on the part of a few to avoid if possible reporting all accidents in order to better their own or division record. These unreported or "blind" accidents constitute a serious problem for the claim or adjustment department, and also cause the company to pay out large sums of money. To minimize this class of accidents our plan provides for the awarding of prizes to those divisions making the best record in this respect. Each "blind" accident charged to a division carries such a high penalty that an otherwise splendid record would be practically wiped out and minimizes the chances for a division winning the monthly prize.

Prior to our intensive safety work we were involved in many car collisions, serious in nature, and costing thousands of dollars, and resulting in serious and some fatal injuries to passengers. In 1912 there were 333 of this class of accidents, as compared with 106 in 1927, a reduction of 68.2 per cent. A comparison of 1922 with the year 1927 shows 164 in 1922, as against 106 in 1927, a reduction of 35.4 per cent. In 1912 we had 1.43 car collisions per 100,000 car-miles, and last year, 0.44. Our record for 1928, based on eight months' experience, will be even better. Of the 106 car collisions occurring last year, few resulted in other than bent fenders or touching of bumpers, and little or no injuries to passengers.

One-Man Car Service Is Inaugurated

In the early part of 1927 with revenues constantly falling off, it was necessary to make drastic reductions in operating expenses, and decision was reached to put into effect one-man operation on all cars in greater Kansas City. Prior to July 1, 1927, 37 per cent of our car-miles were one-man operated, and between July 1 of last year and July 16, 1928, changeover to 100 per cent one-man operation was made. To accomplish this in the short space of a year it was necessary to instruct approximately 600 conductors and 250 motormen in the details of one-man car operation. This greatly increased the work of the instruction department, but we are able to say that changeover has been made without a single serious accident that is in any way chargeable to the change to one-man operated cars. Our peak schedule calls for approximately 700 cars in service. In making this change all possible safety devices were installed on cars, including rear-exit treadle interlocked with brakes, as well as features to make door operation impossible when car is in motion.

All of our cars are single end, and unfortunately the majority of outlying termini are so located as to make looping impossible, so a wye movement must be made. Accidents have occurred to vehicles and pedestrians being struck by the rear end of a car backing at a wye, and in making a changeover to one-man operation, there was installed on these cars a rear end control feature which enables operators to back a car from the

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rear end. Although this safety feature added $30,450 to the cost of remodeling cars, it was thought necessary to install, to eliminate this accident hazard. With one-man cars backed from the rear in making a wye, there have been no accidents of this nature since the change-over to one-man operation.

To reduce the number of so-called "falling in car" accidents, sometimes caused by sudden starting, a line breaker switch also was installed on cars at the time of rehabilitation. This switch between controller and motors opens if the operator attempts to feed too rapidly, which would cause surge on motors. Opening of this switch automatically prevents car jerk from improper feeding of controller. Installation of this feature cost $81,720.

Safety Meetings Are Effective

Safety meetings conducted by division superintendents and assistants are held each week with all men at divisions on the extra board, and once each month, a general meeting for all men at divisions on the extra board. Once each month a general meeting for all men at the divisions is held. Each division, by popular vote, elects ten captains from its own men. These captains, in turn, select their own team from the operating personnel, and the winners on these teams each month receive various prizes.

While we have made a reduction in the number of accidents, we have not been so successful in so far as vehicle accidents are concerned. This is largely accounted for by the great increase in the number of automobiles in Kansas City. In 1912 there were 4,519 automobiles in Kansas City; in 1927 there were 79,763, more than sixteen times as many as were on the streets in 1912. Vehicle accidents during this same period increased 104 per cent, with 2,571 recorded in 1912 and 5,254 in 1927. A large part of this increase, however, can be attributed to conditions existing the latter part of 1918 when almost the entire transportation force left service, making necessary the hiring and training of approximately 6,000 men to obtain a force of 2,000 competent trainmen.

A comparison of 1922 with 1927 shows 4,980 vehicle accidents during 1922 and 5,254 in 1927, an increase of only 5.5 per cent. In this five-year period the number of automobiles in Kansas City increased 54.3 per cent from 51,688 to 79,763. Vehicle accidents in 1912 were 1.11 per 10,000 car-miles; in 1922 they were 1.99 per 10,000 car-miles, and in 1927 they were 2.16 for each 10,000 car-miles operated. Most gratifying of all is the reduction in fatal accidents, there being only sixteen chargeable to car operation in greater Kansas City in 1927, as against 33 in 1912; a decrease of 51.5 per cent during this period. Also, the majority of such fatal accidents occurring in 1927 were ones which our operators could in no way have averted, they being due to gross carelessness on the part of automobile drivers. This total of sixteen deaths in street railway operation is considerably less than the number killed by automobiles in Kansas City last year, and we can say without fear of contradiction that the street car is today the safest means of transportation.

Before concluding, I should like to make a statement with which many may disagree, and that is—It is possible to go to extremes which may react unfavorably. I sometimes wonder if we have not already gone a little too far in being overly cautious as to attempting to prevent accidents with automobiles and trucks. As it is, most of us are constantly telling our men to slow up, and have the car under full control at all street intersections, and I am inclined to believe that this hesitancy or giving of right of way to autos makes the auto drivers more careless, and puts the burden of preventing collisions almost entirely on the railway. No doubt, were we to dispute this right of way with truck or auto drivers, there would for a little while be a considerable increase in accidents with vehicles, but I am of the opinion that within a short time conditions would be much improved over what they are today, in that drivers would become more cautious.

British Municipals Hold Annual Meeting

BUS competition and the outlook for electric railway extension were the principal subjects discussed at the annual meeting of the British Municipal Tramways & Transport Association held at Manchester, Sept. 12-14. In spite of the present fashion for buses, in which the British steam railroads are now participating, the president of the association, James Bowes, J.P., of Manchester, pointed out that the municipal tramways were holding their own and generally were prosperous undertakings.

In a paper, J. K. Cheetham of Oldham pointed out that much of the bus development had been brought about by more favorable legislative conditions, as private undertakings of this character require no statutory authority. He did not know of any case, however, where bus fares were equal to or below the tram fare or where the conditions imposed by Parliament on street railways as to workingmen's fares and a number of other handicaps were imposed upon private bus operators. H. P. Stokes of Plymouth presented the accompanying statistics, based on 86 municipal tramway undertakings which had replied to a questionnaire.

A committee appointed by the Council offered a proposed standard classification of bus accounts in view of the increasing number of buses operated by members of the association.

STATISTICS FROM 86 BRITISH MUNICIPAL TRAMWAY UNDERTAKINGS

	1907–08	1919–20	1927–8
Cars, single truck	6,090	7,265	8,094
Cars, double truck	1,672	3,329	*4,123
Cars, single deck	460	468	556
Cars, double deck open top	3,136	1,622	1,108
Cars, double deck covered top	2,886	6,713	9,245
Cars, total number	7,762	10,594	12,046
Cars, average seating capacity	52	55	59
Track-miles of route	1,480	1,669	1,834
Track-miles measured as single track	2,096	2,688	2,981
Fare, average distance in miles for 1½d. fare	1.95	1.35	1.5
Cost of energy per kilowatt-hour in pence	1.2	1.71	1.19
Total cost, in millions of pounds	37.163	52.544	77.912
Total debt, in millions of pounds	29.456	26.699	35.927
Passengers carried, in billions	2.0126	3.8739	4.0750

*Divided 121 equal-wheel bogies, 4,002 unequal-wheel bogies (such as maximum traction)

Maryland Utilities Association Meets

UNTIL the electric railways of the country have discarded the antiquated rolling stock now being used and have replaced it with modern equipment approaching the automobile and bus in comfort and riding qualities they cannot hope to regain the traffic which has drifted away from them during the past few years, was the opinion voiced by operators at the midyear meeting of the Maryland Utilities Association at Braddock Heights, Md. C. Melvin Sharpe, executive assistant to the president of the Washington Railway & Electric Company, Washington, D. C., took the stand that the time had come for the electric railways to stop "ballyhooing their troubles." "I am not stating the policy of my company," said Mr. Sharpe, "but I firmly believe that the railways must give service as good and as comfortable as the buses. I have never ridden on a trolley car that afforded comfort to compare with the private automobile." Mr. Sharpe further expressed the opinion that the time would come when the industry would endeavor to give each passenger a seat, even during the rush hours.

Miles B. Lambert, of the Westinghouse Electric Company's electric railway division, asserted that trolley cars were already being produced that closely approached the bus in comfort and convenience. He also pointed out that the leaders of the industry well realized the need for new equipment, and predicted that by 1930 the railways would enter upon a period of rehabilitation that would restore them to their old standing among public utilities.

S. E. Emmons, assistant general manager United Railways & Electric Company of Baltimore, made the statement that the cause of his company waging such a fight upon the depreciation issue in its fare case was its determination to set up adequate reserves wherewith to replace its obsolete rolling stock with more modern equipment. Labert St. Clair, director of advertising of the American Electric Railway Association, made a plea for relief from traffic congestion in the larger cities, citing the successful results for all concerned that had followed the abolition of parking within the Loop district in Chicago. He also advocated the employment of salesmen to make a house to house canvass in the interest of the sale of rides.

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News of the Industry

Power at 1 Cent a Kilowatt for Seattle Municipal

A. W. Leonard, president of the Puget Sound Power & Light Company, has submitted an offer to the City Council of Seattle, Wash., to furnish all the electric energy required to operate the Seattle Municipal Railway system at the rate of 1 cent a kilowatt-hour, or a saving of $85,000 a year to the city light department.

Mr. Leonard's statement followed an announcement that members of the City Council has abandoned plans to reduce the cost of current sold to the Municipal Railway, since C. E. Lundgren, chief accountant for the light department, informed them that it now costs 1¼ cents a kilowatt-hour to produce current sold by the city's own plant to the railway for 1 cent.

Mr. Leonard said:

I am surprised to note that according to the figures furnished by Mr. Lundgren the current now being furnished to the railway at 1 cent per kilowatt-hour is actually costing the light department 1¼ cents per kilowatt-hour. At the time of the purchase of the railway by the city, this company contracted to furnish all the current necessary to operate the lines at 1 cent per kilowatt-hour.

The city then reserved the right, however, to take over this load and is now actually furnishing to the railway about 65 per cent of the power necessary for its operation. The balance is still being furnished by this company at 1 cent per kilowatt-hour. This rate provides a reasonable profit to the company and we would be very glad to furnish all of the electric energy to operate the Seattle Municipal Railway at 1 cent per kilowatt-hour and would contract to do this for a definite period of years.

Since, according to the city light department, it is actually losing ¼ cent on each kilowatt-hour furnished, our offer would save the light department approximately $85,000 annually and would release the power which the city is now selling at a loss to meet the shortage which the city claims exists in its present generating capacity.

Frankly, I cannot understand why the city's costs are so much higher than ours. We would consider a load of this character and magnitude profitable and desirable business at the 1-cent rate.

Mr. Leonard's offer to the city was answered by W. J. McKeen, assistant to the superintendent of city light, who replied in the absence of J. D. Ross, superintendent.

Mr. McKeen said:

Mr. Leonard can't sell power to the railway at 1 cent and make a profit if he assumes the burden city light now carries for new buildings, equipment and machinery, to take the place of the old stuff sold us when the city took over the railway from his company, together with the cost of the operators in charge of generators transforming alternating to direct current for the use of the cars.

Talk of furnishing current at 1 cent is buncombe. Mr. Leonard knows he can't do it and we know he can't There is an obligation, in bonds and other securities, of $474 against every horsepower of the Puget Sound Power & Light Company. This contrasts with obligations of $173 against every horsepower of city light. We can sell current cheaper than Mr. Leonard and make a profit.

New San Francisco Line to Open Oct. 20

Opening of the Judah Street extension of the San Francisco Municipal Railway via the newly constructed Duboce Tunnel, is scheduled for Sunday, Oct. 21. Chief Assistant City Engineer Nelson A. Eckart has announced that the new street car line could be opened on Oct. 20, but that in view of the plans of the Sunset organizations for a civic celebration of the event, he would officially open the line the following day.

Trolleys Must Run—Code of Linemen in Jacksonville

LASHING wind and driving rain, broken wires and flooded streets harassed the Jacksonville Traction Company, Jacksonville, during the early part of September, when Florida was hit by a disastrous West Indian hurricane, but in spite of the difficulties caused by weather, the cars established a record by the avoidance of all accidents and the service maintained was so good as to merit the praise of city officials, police and many other persons.

Every resource of the company was used to provide good service to all parts of the city. Seventeen trolley breaks were reported and repaired within a short while. Flooded streets interrupted service on several lines but this obstacle was overcome by routing cars over other lines and transferring passengers. Operators, linemen, repairmen, inspectors and employees of every other department served willingly for long hours to insure a maximum of service during the storm.

The day after the storm, J. P. Ingle, general manager of the railway, made the following statement to the Jacksonville newspapers:

While, of course such interruptions to street car service cannot be prevented, the employees made every effort to reduce them to a minimum—and the consideration and absence of criticism from our patrons in such an emergency are most gratifying to each street railway employee.

Chicago Companies Will Study New Drafts

Officials of the Chicago Surface Lines and Chicago Rapid Transit Company have received copies of the new traction ordinances as tentatively adopted by the local transportation sub-committee of the City Council. The companies have been asked to study the drafts thoroughly and to meet the sub-committee on Oct. 15 to negotiate for a permanent settlement.

The fundamental points in the new ordinances and financial plan, which the companies are asked to accept and which have been previously reported in ELECTRIC RAILWAY JOURNAL, are consolidation of elevated, surface and bus lines; local regulation, service-at-cost, construction of a downtown subway system, and amortization with a view to city purchase within 40 years. The committee is said to favor the plans submitted by Major R. F. Kelker, Jr., city engineer, for a comprehensive rapid transit subway to be financed by special assessment and ready for operation in the next fifteen years. Estimates on the cost of the tubes range from $79,000,000 to $99,000,000 for the fifteen-year period.

No decision has yet been reached by the committee on the capital value of the proposed unified transportation company or on the future use of the city's $55,000,000 traction fund and $16,000,000 renewals fund, although it is estimated that the capital account will be somewhere between $250,000,000 and $265,000,000. Under Major Kelker's plan both the traction and renewals fund would be used in purchasing bonds of the new company.

The return to the company, according to the Kelker plan, would total approximately $15,430,000. The actual compensation which will be allowed to the company, however, will be only about $1,130,000, or one-tenth of 1 cent from each of the estimated 1,130,000,000 revenue-passengers. The balance of the $15,430,000 is obtained by figuring the capital value at $260,000,000 and granting a 5½ per cent return on that amount, most of which will be paid out in interest on bonds and stocks owned by the city and other security holders.

Discussion of the sections of the ordinance dealing with subway construction disclosed at the last meeting of the aldermen, that a group of Chicago contractors had submitted a proposition to the city for franchises to organize a new company to take over the present surface, bus and elevated lines and to build and operate a subway system approximately 192 miles in length. It has also given assurances that it could raise between $700,000,000 and $800,000,000 to finance the projects, and amortize and return the properties to the city in 60 or 65 years.

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Interborough Man Arrested

The arrest of Harry C. King, Interborough Rapid Transit Company train clerk and occasional towerman, was ordered by Magistrate Corrigan in the homicide court in New York on Oct. 4. He was charged with second-degree manslaughter in connection with the fatal subway wreck in the Times Square Station of the Seventh Avenue Subway on Aug. 24. At the same time, the magistrate dismissed the homicide charge against William S. Baldwin, Interborough maintenance man, who had been on trial before him.

Dinner for Richmond Executives

Although the date of the event has not yet been determined, a congratulatory dinner is to be tendered President William E. Wood and officials of the Virginia Electric & Power Company, Richmond, Va., and officials of Stone & Webster, Inc., of which the company is a subsidiary. The occasion is in recognition of the winning of the Coffin award. The dinner will be given by the Richmond Chamber of Commerce. In the resolution adopted by the Richmond Chamber of Commerce, it is stated that body "is deeply appreciative of this fine honor the Virginia Electric & Power Company has brought to Richmond, to Virginia and to the South."

Massachusetts Electrification Awaited

Electrification of the Boston, Revere Beach & Lynn Railroad is to be completed this month and will then become a part of the extensive trolley system of Metropolitan Boston. The steam engines which formerly drew the narrow gage trains are to be discarded but the cars have been fitted with motors of their own.

Under the new scheme of operations schedules will be shortened with a noticeable improvement in service and in more economical operation. The line is being supplied with current from the Edison Electric Illuminating Company and the Lynn Gas & Electric Company. A substation has been established at Orient Heights and another at Lynn to provide for the increased load.

Progress of Fare Fight in Los Angeles

Carrying the fight to preserve a basic 5-cent fare on the street railways of Los Angeles to the Supreme Court at Washington, Attorney Carl I. Wheat and Assistant Attorney Reginald L. Vaughan of the Railroad Commission have left San Francisco to present to the justices of the Supreme Court a plea for a stay of execution of the 7-cent fare granted by the Federal District Court at Los Angeles. That court has allowed a stay to and including Oct. 15, thus giving time for the attorneys for the Railroad Commission and the city of Los Angeles to present the matter in Washington. Herman Mohr, deputy city attorney of Los Angeles, and attorneys Wheat and Vaughan will prepare together the necessary petition for a further stay pending appeal while traveling east.

The decree of injunction issued by the Federal Court on Oct. 1 would have gone into effect on Oct. 11 had it not been for the granting of a motion for five days stay by the judges at Los Angeles. All of the necessary steps for the taking of an appeal from the decision of the lower court have now been completed and whether or not the Supreme Court grants a further stay of execution of the injunction it is expected that the case will be advanced on the calendar so that final determination may be expected within a few months.

The change in fare would affect every rider on the street cars of the Los Angeles Railway Corporation, since rates will be increased from 5 to 7 cents if the injunction should go into effect. It is expected that the argument for a stay will be made on Oct. 15.

Wage Hearings in St. Louis

Hearings on the demands of the union employees of the St. Louis Public Service Company, St. Louis, Mo., for increased wages and improved working conditions are being held at the St. Louis City Hall. The Missouri Public Service Commission, acting as arbitrator between the company and the men, is taking the testimony. The City of St. Louis intervened in the case so that any increased rates of fare involved in the final decision could be handled at the same time.

All the contentions made by the men to date have been disputed by the company. Although the main battle is centered around the 3,600 platform men and bus drivers hundreds of shop workers and maintenance men are affected. Indirectly the decision of the commission will also affect all other employees.

The present wage of platform men is 50 cents an hour the first year, 55 cents the second, 63 cents the third year and 67 cents the fourth year and thereafter. This class has demanded 55 cents the first three months, 62 cents the second three months, 68 cents the third three months and 72 cents after a year. Other demands provide that 65 per cent of the runs be made "straight" runs and that time and a half instead of time and one-fourth shall be paid for all overtime; that the $100 a month minimum wage be abolished and that there be substituted a rule that all men reporting for duty be allowed pay for two hours each time he reports whether he takes out a car or not.

The company will present testimony to show that if all the demands are met an additional $4,000,000 a year in revenue will be needed and an increase in fare of at least one cent from the present 8-cent rate. The company contends that it would be forced to raise all its wages in proportion to any increase granted the union men.

Benefits for South Shore Region

In accord with its policy of advancing step for step with growth in business, the South Shore Line has put into effect a new, faster train service between Chicago and all stations on its line. Steadily increasing passenger returns, due to the public's appreciation of the greater convenience of South Shore Line service through the congested-highway region south and east of Chicago, have made it feasible to advance to a still faster running time, according to officials of the line.

Ten minutes will be cut off between South Bend and Chicago, in both directions. Limited trains will now make this 90-mile run in two hours and twenty minutes. As a special convenience to South Bend and Michigan City patrons, an extra fast dining car train will leave South Bend at 7:00 a.m., making the trip to downtown Chicago in two hours and five minutes, the fastest time ever offered South Shore Line patrons. A 5:15 p.m. dining car limited out of the suburban station of the Illinois Central Railroad at Randolph Street, Chicago, will cover the distance to South Bend in the same fast time.

Limited train times will be shortened at every station along the line. So complete are the changes in every instance that the patron is urged to obtain a time folder from the ticket agent, in order to fix in mind the new leaving times. South Bend departures will be unchanged, the famous "every hour on the hour" rule still holding good. At Michigan City, the general leaving time for westbound trains, with exceptions, will be 12 minutes before the hour, instead of nine minutes as heretofore. At Gary the leaving times for westbound trains will be advanced as much as eight minutes. Advances at East Chicago and Hammond will correspond.

Half hourly service to Hammond, East Chicago and Gary will be extended from 7:30 to 10:30 p.m. for eastbound trains, and from 8 p.m. to 11:22 p.m. for those leaving Gary for Chicago. The schedules of the Chicago-Gary express runs will also be speeded up. The after-theater flyer, which will make all limited train stops, will permit theater patrons to "see the last act" before leaving for their train. This will be a two-hour-ten-minute train to South Bend.

Connecting motor coach service to Benton Harbor and St. Joseph, Mich., and points on the way will be speeded up to meet the faster South Shore Line schedules. Shore Line motor coaches will connect at Michigan City with trains leaving Chicago. New time folders recently issued cover these changes, and are obtainable at all Shore Line motor coach stations.

These improvements are a further step in the big program undertaken by the present management when it took over the South Shore Line three years ago. They are being made in order to give the cities of the South Shore region the very best transportation service consistent with the traffic potentialities of the territory served.

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Dispute Over Contract Clause in Montreal

A dispute between the city of Montreal, Canada, and the Montreal Tramways on the interpretation of a clause in the contract over the percentage of earnings to be paid to the city will be submitted to the superior court in an action which the city has taken for $250,000 damages.

Under the original contract of 1892, according to the city, the company agreed to pay 4 per cent of the gross earnings and a sliding scale was established whereby the percentage increased by 2 per cent for every additional $500,000 earnings up to 15 per cent, when the receipts reached or exceeded $3,000,000 a year. In 1918 the contract in which this stipulation was embodied was replaced by another contract, and a clause set forth that the rights of the parties to claims made under the old contract would not be prejudiced by the new. It is said the litigation has been submitted to the courts more as arbitration on a subject upon which the parties have been unable to agree.

Hammond Improvement Ordered

The Hammond, Whiting & East Chicago Railway and its receiver, the Chicago Title & Trust Company, have been ordered by the Public Service Commission of Indiana to begin elevating the railway's tracks on Hohman Street in Hammond to the new grade. This order was issued following the filing of a petition by the city of Hammond in which the city demanded that the railway raise its track to grade level or surrender its franchise.

During the hearings, city officials of Hammond testified that the improved section of Hohman Street, one of the principal thoroughfares of the city, could not be opened to traffic until the company's tracks were raised to the level of the new pavement and the right-of-way improved.

Charles Lawrence, superintendent of the railway, testified the company was willing to undertake the improvement, which was estimated to cost $10,000, but was financially unable to do so, owing to the heavy operating losses suffered during the last twelve months.

Flower Gardens a Hobby in Chicago

As a part of its campaign for better public relations, the Chicago Surface Lines has been conducting a contest among the car stations for the most attractive flower gardens. The awards have just been made, Noble division being first, Devon second, and North Avenue third. The gardens were laid out and maintained by the men at the car stations under the direction of the foremen and some very beautiful displays of flowers resulted. At most of the car stations, window boxes were used in profusion, and ground which heretofore had been allowed to lie idle was cultivated and turned into beautiful flower beds. The track department also made special efforts to beautify loops and terminals.

Many letters of commendation were received by the management. The contest will be continued next year.

Another Plan Evolved for Seattle Pension System

As the financial frailty of the Seattle Municipal Railway department, Seattle, Wash., now stands as an obstacle to the proposed new pension and annuity system voted by the people last year for city employees, it is now proposed that the rates to be charged employees for the maintenance of an annuity fund to accompany the pensions, be reduced if possible; that employees be not limited to credit for only 25 years of service; and that aged employees who would be forced into retirement Jan. 1, under the ordinance as it now stands, be given more time.

This idea was advanced after members of the Council declared that no way had yet been found by which the utility would be able to pay its share of $143,283 into the fund of $369,680 needed in 1929 for the first year of the pension system. To leave employees of the railway department out of the pension system as a means of solving this phase of the problem would be illegal, city officials claimed, and it was said that it would be equally impracticable to lay the burden of this or any other utility department upon the general fund to be shouldered by the taxpayers. Opposition by some of the older city employees to certain provisions of this measure previously had threatened to cause the Council to abandon the entire pension matter for another year.

Overcoming Study Difficulties in Los Angeles

A new appeal is being tried in Los Angels, Cal., by an adult education council composed of the leading universities and school systems working in conjunction with the Pacific Electric Railway. The plan is to benefit the commuter who meets the suggestion of the railway company "You can study while you ride" with "Yes, but I don't." Since the difficulty is largely one of the bulk of the textbook, the objection of size is to be overcome by the substitution of small, portable units in loose-leaf, pocket-size form. The commuter takes a few pages with him each morning, slips them into his pocket and uses them for study on the train. The loose-leaf forms are made by cutting up standard textbooks into neat units and punching them for insertion in a manilla binder.

The Los Angeles County Council for Adult Education is in charge of the commuters' school. By agreement with the Pacific Electric Railway every ticket agent of that company becomes an information agent and salesman for the courses in the commuters' school.

Explanation of Boston Agreement Made to Governor Fuller

Provisions in the new agreement between the Boston Elevated Railway, Boston, Mass., and the Carmen's Union are summarized in a report which Chairman Samuel L. Powers of the board of public trustees has submitted to Governor Fuller of Massachusetts. By reason of that agreement, and subsequent votes of the board of trustees four specific results have been accomplished. They are enumerated by Chairman Powers as follows:

1. That the general manager is directed to submit to the board of trustees his recommendations of persons for appointment as motormen in rapid transit service, together with an abstract of the records and qualifications of such persons.
2. That all rapid transit motormen will be given a physical examination at least once each year.
3. That the records of all rapid transit motormen have already been examined, four besides McDonald (operator of the fatal train) have been dismissed, and others are under consideration.
4. That hereafter, by agreement with the union, in case of the discharge or suspension of an employee, the final appeal by the union will be to the board of trustees. Heretofore an employee had the right to appeal to a board of arbitration.

Under the new arrangement an examination of the motormen has already been held and General Manager Edward Dana has classified them as "good," "fair" and "not so fair." Since then six motormen who were classified as "not so fair" have been discharged by the management in the interest of safe operation, exclusive of Motorman McDonald, who was found guilty of the fatal Beach Street accident.

Chairman Powers also reports:

The agreement we have secured with the union is of far-reaching importance. It is the very thing that we have attempted to secure for many years past, without success. We now have the power to enforce discipline with far greater freedom than ever before, and the authority thus secured cannot fail to have a salutary influence upon the men engaged in the operation of rapid transit lines.

My feeling is that your co-operation in this matter of discipline has been of the greatest service to us in bringing about a modification of the agreement with the Carmen's Union. In saying this I do not mean to have you understand that we have failed in the enforcement of discipline in the past. Our records show that since Jan. 1, 1920, 476 employees in car and train service have been discharged for disciplinary reasons, such as accidents, use of liquor, fare irregularities, continually being late, insubordination, incivility and various other causes; but the very fact that a discharged man had the right of appeal to a board of arbitration, with the privilege of selecting one of the arbitrators, made the men feel more or less secure against discharge for misconduct.

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New Merchandising Plan

Utica to be scene of program designed to appeal to 83 per cent of buying public

A SYSTEM for stimulating street railway and bus travel and at the same time improving the commercial activity of downtown business districts, announced by the Co-operative Exchange System, Inc., New York City, is to go into effect on Nov. 1 on the lines of the New York State Railways in Utica, with the prospect of its application to the other cities of the system at regular intervals.

Among other factors, the program embraces a patented co-operative cash discount coupon which is issued as fare is paid and accepted as cash by merchants of the community, on the basis of minimum purchases. The net result is that while the fare remains the same, the cost of a ride is reduced as much as 86 per cent, but the economic inducement is such that it should result in an increase in street car and bus travel.

In congested business districts, progressive merchants have for some time been offering to refund to patrons who come by automobile the cost of their parking, provided their purchases bulked larger than $1, the object being to encourage automobile patrons to visit the business district more frequently.

Based on the analysis of traffic conditions in Milwaukee, Pittsburgh and Detroit, which show that approximately 19½ per cent of the traveling and buying public walk, 17½ per cent ride in private automobiles and 63 per cent use group transportation, any inducement made to the automobile using public affects only 17½ per cent of the potential buying public while most of the 83 per cent of the buying public is left without any special inducement to visit the business district more frequently. The program of the Co-operative Exchange System, Inc., is directed toward inducing the 83 per cent to travel more frequently and to travel by street car or bus.

Under the plan about to go into effect in Utica the fare receipts which are given to each rider have cash discount coupons attached. These coupons are accepted by merchants on the basis of 2 cents on each 25-cent purchase. In other words, if a person makes a 25-cent purchase he pays 23 cents in money and 2 cents in coupons. A dollar purchase is made for 92 cents in money and 8 cents in coupons, etc. Coupons must be used in the week in which issued and each week begins a new series of a different color to facilitate redemption by merchants. The cost to the merchant upon first consideration appears to be 8 per cent, or as 2 cents is to 25 cents, but the cost against volume really is found to be about one-half of 1 per cent. The merchant simply agrees to accept the coupons on the basis of minimum purchases.

The program costs the railway nothing until revenue has been created, at which time it pays to the company operating the plan a percentage of the actual increase. Under this arrangement the cost of installing and supervising the program is borne by the Co-operative Exchange System, Inc. It is this type of contract which has just been signed by the New York State Railways. It is understood that in two days more than twenty leading merchants in Utica, representing twenty different retail lines agreed to the plan. The program is not limited to any particular merchant or group of merchants and it is expected that by the time the first coupon is issued about Nov. 1 more than 200 merchants will be participating in the plan.

The program of the Co-operative Exchange System, as offered to the transportation industry, comprises a complete sales service and is so planned as to cost the railway nothing unless and until results are obtained.

Higher Subway Fares Urged in New York

Higher subway fares in New York City to make the city's investment of about $250,000,000 in present subways and nearly $500,000,000 on new subways self-sustaining and to release at once ample funds from the city debt limit for the construction of the proposed tri-borough bridge, schools, tunnels and playgrounds, are advocated in a report of the committee on public service in the metropolitan district of the Chamber of Commerce of the state of New York.

The report is based on a study of the city's financial difficulties for ten years. It states that the basic and fundamental problem in the city's straitened financial condition, and the one certain and immediate remedy, is an increased subway fare. The report further suggests that necessary improvements, including some advocated by Mayor Walker, cannot be financed now without exceeding the city's debt limit, and that this condition exists only because of the attitude of the city authorities on the 5-cent fare.

When the new lines under construction are completed the city will have about $1,000,000,000 invested in subways. As the fares collected in the subways are not sufficient to pay interest on the investment, the city's debt for subways is not exempt from the debt limit, as the members of this chamber fully appreciate. The report says:

The chamber has repeatedly advocated subway fares sufficient to make our transit facilities self-supporting. This action would automatically release the bonds issued by the city for the subways now in operation, amounting to about $250,000,000, from the city debt limit. The city then could go ahead at once, not only with building the tri-borough bridge, but with the construction of schools, playgrounds and many other much-needed improvements.

Car Award Still Pending

The award by the Detroit Street Railway Commission of contract covering 100 street cars for the municipal railway to Perley Thomas Car Company, after having been informally approved by City Council, has been referred back to committee for further consideration as result of protest of other bidders.

Sensing the Public Pulse

Omaha wonders what innovation Mr. Shannahan will spring next. Election coming

IN NOVEMBER a year ago Omaha was anxiously awaiting the arrival of John N. Shannahan, who was to prescribe for the Omaha & Council Bluff Street Railway. This November the "doctor of sick street railways" will be watching the election returns, wondering if the public wants him entrusted with the 30-year franchise ordinance to supply transportation in Omaha and Council Bluffs. His earnestness on the new franchise grant is evidenced in the negotiations with the City Commission, and his own statement "When I accept the franchise I marry it; I accept it for better or for worse."

A cursory glance at the record of activities in Omaha under Mr. Shannahan's guidance would make it appear a foregone conclusion that residents of that city would give without any reservations a free hand to so accomplished a leader. Even if nothing were known of his former record in the railway field, notably in Newport News, his accomplishments at Omaha have already surpassed even generous expectations.

Concentrating more on the making of potential friends than on the number of revenue-miles, he has rarely missed an opportunity for performing some service no matter at what inconvenience, if it appealed to the rider. He solicited suggestions and complaints, too, and whenever worth while, he acted upon them immediately.

When he sensed general dissatisfaction over the ruling that no smaller number than six tokens at 40 cents could be purchased at a time, he arranged to have the fare put on a three-for-20-cent basis. The return to the skip-stop system is the result of an overwhelming vote in its favor, a vote in which ballots were placed in the cars and every rider asked for his opinion. More recently he asked Omaha what color it favored for its cars—and presto—the former yellow pigment is to dissappear in favor of golden brown.

But one might expatiate at even greater length on Mr. Shannahan's many acts of courtesy and kindness toward his patrons. One humane and wise edict of his issued last winter during an unusual cold spell elicited favorable comment from the press of that city. Trainmen were told to "wait for passengers." In explanation he said:

"A few seconds lost in schedule time in this way are compensated by the appreciation the passenger shows for the friendly act."

In his philosophy, mice can bring forth mountains, his little acts having great consequences. Even the New York *Times* in its issue of Sept. 2, commented on the political troubles of Omaha, and discussed the transit situation, and in eulogistic terms told about Mr. Shannahan's accomplishments in establishing good feeling on the part of the patrons of that city.

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Large Sale of Pullman Tickets at North Shore Stations

Travelers purchasing inter-line railroad tickets have found a great convenience in the Pullman car tickets placed on sale at the principal North Shore Line stations. The Chicago, North Shore & Milwaukee is the only electric interurban in the country which has been given the privilege of selling through Pullman car tickets. The privilege was granted on Aug. 1. For August the sale was greatly in excess of expectations of traffic officials of both companies. The business was especially heavy in Milwaukee, travelers appreciating the convenience of being able to buy their Pullman tickets along with their railroad tickets and to have their baggage transferred at Chicago without any trouble to themselves.

Wage Agreement in Springfield-Worcester Continued

The Springfield Street Railway and the Worcester Consolidated Street Railway, operating in Springfield and Worcester, Mass., respectively, have drawn up a two-year contract with the uniformed employees of the companies that extends the present wage rate which has been in force since 1924. The scale to be continued calls for a wage rate of 68 cents an hour for operators on cars with two men and 76 cents an hour for operators of one-man cars. This renewal follows a month of conferences at which Attorney Louis C. Parker, Westfield, acted as intermediary. Clark V. Wood of Springfield, Mass., is president of both companies.

Arguments on Piedmont and Northern Issue Continue

Extensions of the Piedmont & Northern Railway in the Carolinas would not make a new trunk line railroad by consolidation with existing steam lines, H. J. Haynesworth, Greenville, S. C., attorney for the railway, told the Federal District Court at the second day's hearing of the injunction proceedings brought by the rail line against the Interstate Commerce Commission. Rebuttal arguments of the Piedmont & Northern attorneys answering contentions by Blackburn Esterline, assistant to the solicitor-general of the United States, opposing the proposed extensions, featured the session of the court. Mr. Haynesworth took up the question of the jurisdiction of the Interstate Commerce Commission in supervising electric interurban railways under the act of Congress establishing its power.

After Mr. Haynesworth's argument, S. S. Alderman, representing the Southern Railway, one of the defendants among the steam roads, sought to controvert the arguments advanced in behalf of the electric carrier.

The Piedmont & Northern is seeking an injunction against the Interstate Commerce Commission to prevent its enforcing an order denying the railway the right to make two extensions of its lines to connect up two sections. One of these sections is in North Carolina and the other is in South Carolina.

Marking Street Car Stops in San Francisco

As a rule, all Market Street cars in San Francisco stop on the near side of crossings, but where the cable cars stop on the far side of a crossing white stop marks are placed on the street paving. In a few places where electric cars stop

So the rider may be sure

on the far side of crossings overhead "cars-stop-here" signs are hung. At the Market Street safety stops the stop marks on the inside tracks are located several feet back of the marks on the outside tracks, since the street is used by both the Municipal and the Market Street Railways. This enables passengers to pass conveniently behind cars on the outside track to board cars on the inside track. When cars are approaching on both tracks a hand signal to the inside track motorman given by the passenger waiting to board a car indicates that the passenger wishes to board his car; however, such a signal is ordinarily unnecessary.

Under these conditions a great deal of time and much annoyance are saved street car patrons in San Francisco by the practice of painting the words "Enter Cars Here" at the point on the pavement where the rear of the car stops. This also saves considerable time of the company. Ordinarily, people waiting to board cars stand on the crossing, but the effort has been made to induce them to stand at the end of the safety station where the car stops. It is at this point that the words "Enter Cars Here" have been painted.

Freight Business on South Shore Booming

Rapid growth of carload freight business south and east of Chicago on the Chicago, South Shore & South Bend Railroad (South Shore Line) has necessitated the establishment of a new carload freight station at Hokewisch, Ill. The new agency opened on Oct. 1, at 13550 Brainard Avenue, and will handle all carload freight formerly handled through the Kensington Station.

Safety Awards in Alliance

Prizes amounting to $300 have been awarded car operators by officials of the Stark Electric Railroad Alliance, Ohio, for safety records during the last twelve months. Original plans called for awarding three prizes, totaling $175, but because of the close race, officials allowed three second and two third prizes.

Charles Smith, an interurban operator, won first prize of $100 for completing 3,100 hours without an accident. J. L. Fryfogle with no accident in 1,600 hours, F. L. Snyder with two minor accidents in 3,100 hours and Bert Patterson with one accident in 2,500 hours were awarded second prizes of $50 each. P. D. Tullis with two minor accidents in 2,500 hours and E. J. Brooks with two minor accidents in 2,700 hours were awarded third prizes of $25 each.

To eliminate accidents, an operator's school is conducted each Tuesday by Walter Croft, superintendt of transportation. Night men report for classes at 9:30 in the morning and day men at 6:30 in the evening.

In the cause of safety, E. W. Sweezy, general manager of the Stark Electric, has ordered five new block signals at a cost of $3,000 to be installed between Alliance and Salem. When this work is finished the entire system from Canton to Salem, a distance of about 33 miles, will be similarly protected. The system between Alliance and Canton was installed early this year.

No Repeal of One-Man Car Restriction in Oakland

Final action on repeal of the one-man street car ordinance was taken by the Oakland City Council on Sept. 21. The proposal to rescind the measure was lost. The repeal ordinance was introduced six weeks ago by Eugene K. Sturgis, commissioner of revenue and finance. It would have permitted operation of one-man street cars in Oakland, now prohibited by city ordinance.

The measure was passed to print on Aug. 9, when Mr. Sturgis, Frank Colbourn, commissioner of public works, and William H. Parker, commissioner of streets, voted in favor of it. Mayor John L. Davie and Charles C. Young, commissioner of public health and safety, opposed the ordinance.

Sponsored by the Key System Transit Company, the ordinance has been the subject of heated controversy since its introduction. Heading the opposition was William J. Moorehead, former city commissioner and representative of the trainmen. Numerous civic and improvement clubs voiced the opinion that adoption of one-man cars would prove hazardous, add to the unemployment problem, and impede service.

The Key System took the stand that extra traffic hazard would not be introduced, that no men would be thrown out of work, but that extra cars could be run with use of trainmen on the ground as collectors.

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Indorsements of the company's stand were filed by numerous civic and labor organizations.

Omaha Employees Active in Chest Drive

A campaign will be conducted among employees of the Omaha & Council Bluffs Street Railway, Omaha, Neb., from Oct. 15-24 for contributions to the Omaha Community Chest drive. Lieutenants have been appointed in every division of the company, who in turn will appoint assistants to call on individual employees to ask them to contribute to the chest. John N. Shannahan, president, in a message to the employees, urges all to help those who are less fortunate; to give cheerfully and generously. The amount to be raised is $446,649, divided on a percentage basis among 31 organizations, embracing all creeds. The slogan adopted for use during the campaign is "Omaha Must Take Care of Its Own."

Briefs Filed in Interborough Case

Four briefs, totaling more than 700 pages, were filed on Oct. 8 in the United States Supreme Court by the Interborough Rapid Transit Company in defense of its plea for a 7-cent subway fare. The case, appealed by the city of New York and the State Transit Commission, is scheduled to be argued on Oct. 15. One of the briefs said:

No statute authorizes the imposition upon the elevated railroads operated by the Interborough Company of a fare limitation of 5 cents, and without such statutory limitation the fare limitation is void.

The city claims the fare limitations applying to those subways and elevated lines, embodied in contracts, must be held legal. The company's brief argued at great length on the points of reasonable return on the value of the property and stated that the right to a "reasonable fare" has not been contracted away by the company.

The Transit Commission's action in denying the road an increase was argued to be a denial of due process of law and confiscation. More than 40 separate legal points were discussed in the briefs.

Firemen and Police of Seattle Scored Again on Free Ride Issue

Abolition of free rides on the Seattle Municipal Railway System, Seattle, Wash., for policemen and firemen has again come up as a city budget issue. E. L. Blaine, chairman of the finance committee, declared that in his opinion policemen in uniform should ride free, but should not have the privilege when not on duty, nor the right to take their families with them as some do without paying fare. Efforts to strike from the budget $40,000 to pay for policemen's rides and $38,000 for firemen's rides failed at the budget hearing.

What the Street Car Tie-Up Showed

IT TOOK a five-hour paralysis of the trolley lines during Monday's storm to convince the city that the street car is still the dog-faithful handyman of transportation. . . . Of the street car service, this much only need be said: It is of that vital class of things which are most highly valued when they are least in evidence. Creatures of habit, we accept the efficient, continuous, reliable operation of the trolley as we accept the schedule round of the sun or the clock-like ebb and flow of tides. The failure of cables was unfortunate, but it at least jarred us out of the routine; it helped us evaluate a service which lies 24 hours a day unnoticed and unsung, at the very tip of our collective noses. The service, now that it is normal, will be shortly forgotten. We shall speak again, shortly, of the automobile age. But the trolley will function 365 days in the year, in the same old rôle. Monday merely emphasized the rôle; Tuesday obscured it, suddenly and completely, behind the curtain of routine.—Minneapolis *Tribune*.

Committee to Study Pittsburgh's Needs

A committee has been appointed by the Allied Boards of Trade to study Pittsburgh's railway and bus service, including the 25-cent bus line, and many other transportation angles. Possible provisions for a subway and other rapid transit facilities probably will be included in the scope of the transportation survey, but for the present the committee will focus its attention on traffic problems that give promise of being adjusted to afford early relief. The allied boards, through the special committee, have employed expert assistance to go into virtually every phase of Pittsburgh's transportation system.

C. V. Shoup has been appointed chairman of the special committee. George P. Kountz and Harry Bastow, president and secretary, respectively, of the Allied Boards of Trade, are ex-officio members.

P. J. McGrath, secretary of the Amalgamated, recently headed a delegation of union leaders who appeared to protest against increasing the number of one-man cars on the lines of the Pittsburgh Railways. The objections of the men were heard by members of the traction conference board, of which Charles A. Finley is head, the members of Council, representatives of the law department and of the railway. The matter was referred to the traction conference board.

Mr. McGrath said in part:

I am not for one moment saying this as a threat, but it is the feeling among many of the employees that they cannot go much farther under the present system of operation. I hope it will not be necessary for them to take the stand that they cannot continue to operate one-man cars under present schedules.

The men told the Council that tney had been informed that the number of one-man cars was to be greatly increased in the near future and asked that this order be held up until the matter could be looked into.

W. T. Rossell, general manager of the railway, cited a list of cities where one-man cars are used, and said that the experience in Pittsburgh and elsewhere showed them to be even safer than the two-man type, in which responsibility for operation is divided.

More Motor Truck Lines for Michigan Electric

An order authorizing extension of freight service of the Michigan Electric Railway, Lansing, Mich., by permitting the Southern Michigan Transportation Company, a subsidiary, to operate trucks and trailers over routes paralleling the present railway lines and over additional routes has been issued by the Michigan Public Utilities Commission

The Michigan Electric Railway is now operating trucks on highways paralleling its lines. The new order grants authority to operate trucks between Grand Rapids and Jackson and from Owosso to Flint over routes not served by the electric lines.

Additional service is added on the highways extending from Kalamazoo to Grand Rapids; from Kalamazoo to Battle Creek to Jackson, from Jackson to Lansing and St. Johns; from Kalamazoo to Allegan and Lansing, and from Grand Rapids to Grand Haven and Muskegon.

The subsidiary company is authorized to serve intermediary points on the main lines with the exception of several routes now served by other companies operating under the authority of commission orders granted previously.

Oppose Higher Fares on Chicago-Elgin Line

Commuters from fourteen western suburbs of Chicago have organized and incorporated the Commuters' Protective League for the purpose of opposing the proposed increase in commutation rates by the Chicago, Aurora & Elgin Railroad.

Permission to raise commutation fares to new levels ranging from 2 to 30 per cent over existing rates was asked by the company early last spring. The new rates were to have gone into effect on Sept. 15 had the commission not ordered the railroad to maintain its present fares until an examination of its finances could be completed. In its order of Sept. 14, the commission suspended the higher fares until Jan. 12, 1929. In the meantime hearings on cost of operation and earnings will be conducted.

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How Much Pay for Beebe of Seattle?

Just how much the city of Seattle, Wash., must pay to B. H. Beebe, world-war veteran, employed as a motorman on the Seattle Municipal Railway, to make up the difference between his earnings on a part-time job since January, 1927, and what he should have earned on a full-time job, in accordance with a recent State Supreme Court decision, is the problem to come before the finance committee of the City Council. The court ruled that because the Seattle city charter grants a preference to the World War veterans in the matter of employment, Mr. Beebe should not have been put on the part-time list until non-veterans, irrespective of seniority, had been previously reduced. He was awarded judgment for the difference in salary during 1927 and costs, amounting to about $500, and he now asks for the payment of this judgment and for recovery of the difference between his pay on the part-time job and that for a full-time job since last December, and up until such time as he may be reinstated in a full-time position. It is roughly estimated that he will be paid about $1,000 by the city.

Taxes Total $122,758 in Virginia

Taxes totaling $122,758 will be paid to the state of Virginia by the electric railways under the assessments by the State Corporation Commission for 1928. The total value of the tangible property of the electric railways was assessed at $9,875,555. Of the $122,750 in state taxes the Virginia Electric & Power Company, operating in Richmond, Petersburg, Norfolk, Portsmouth and other places, will pay $80,689. Its annual franchise tax, based on gross transportation receipts in 1927, will amount to $71,893. The company's real estate, roadway and other tangible property, taxed by the counties and cities, was assessed at $5,770,673.

Reconditioning of London Cars

At a recent meeting of London County Council, London, England, the Highways Committee reported that if the Council continued its program for the reconditioning of tram cars with transverse cushioned seats and other improvements, 1,450 cars would be reconditioned by June 30, 1930. The total number of cars fit for service is 1,777. Two experimental cars for use in hilly districts have been authorized and when the result of the experiment is known, the committee will consider the provision of 50 cars of similar type.

Italy the Second Country in Railway Electrification

Extensive development in the electrification of railways in Italy is shown by statistics recently compiled of electrification in various countries, which place Italy as now the second country of the world in the length of electrified railway lines. It is surpassed only by the United States. Italy has approximately 1,600 kilometers of railway lines operated by electricity, compared with approximately 3,000 kilometers in the United States. Italy is only slightly in advance of Switzerland in electrification, the latter country holding third place with a total length of 1,500 kilometers of electrified railway. Switzerland is followed by Germany, with 1,445 kilometers, and at a much greater distance by France, which has only about 1,000 kilometers of electrified line.

Foreign News

Extension Planned by Seibu Railway

Construction of a short extension to one of its lines is planned by the Seibu Railway, Japan, which operates about 52 miles of electric railway in the Tokyo district. Plans are also under way for future construction of 16 miles of line from the Shinjuku Station in Tokyo to Tachikawa, and change from single track to double track for one of its other lines running out of Shinjuku Station in Tokyo. The company is capitalized at 13,000,000 Yen, 6,900,000 Yen being paid up. The company has annual profits of more than 300,000 Yen and usually declares 8 or 10 per cent dividends.

Bavaria Installs Electric Service

Electrification of the section of the Bavarian railways between Rosenheim and Traunstein was recently completed, and electric trains are now running between the two towns. It is expected that the section between Traunstein and Salzburg will also be completed within a short time.

Old Wales Railway Electrified

Electrification of what is claimed to be the oldest railway in Wales, the Swansea & Mumbles Railway, is close to completion. The cost of this work will be more than $5,750,000. Power is supplied to the line from the Swansea public utility which has completed the erection of a special substation at Blackpill to furnish 1,500-kw., three-phase alternating current at 6,000 volts. Current is converted by 500-kw. rotary converters to 650 volts direct current for the overhead transmission line, which is arranged for the sliding bow type of equipment. Eleven new cars for the line are being constructed by the Brush Electrical Engineering Company, Ltd., and will be operated in pairs, furnishing a 7½-minute service. Each car, double-decked, weighs 30 tons and will accommodate 106 passengers.

Indian Electrification Progresses Rapidly

Electrification of the main line of the Great Indian Peninsula Railway, India, is progressing rapidly. It was originally hoped to open the electric service from Bombay to Poona on March 31, 1929. It now appears probable that the new power house will be ready to give a limited supply of current by the end of January and the transmission lines are expected to be completed during that month. It is hoped that limited service will be possible by the middle of April. The electrified line to Igatpuri will be opened a year later, when the whole undertaking should be completed.

Train Services Improved in London

Many important service improvements were introduced this year on the Hounslow, Harrow, Ealing and Uxbridge lines of the Metropolitan District Railway, London, England. These included new trains, earlier trains, longer trains and more through trains.

Hitherto manually operated signals have been used on this outlying section. These were superseded on March 5 by a system of automatic signaling similar to that in use on the London Underground Railways. As a result it is possible to operate eighteen additional trains to and from the stations above named during heavy traffic hours.

New Japanese Subway Declares Dividend

Net profits of the Tokyo Subway Company, Tokyo, Japan, amounted to 340,757 yen ($159,712) for the first term of operation, out of which a dividend totaling 216,000 yen ($101,239) or 8.1 per cent has been declared. The company has been in operation only a few months.

Liverpool Tramways Still Helping the Ratepayers

The Liverpool City Council has agreed that a further sum of £115,000 shall be allocated from the profits of the tramway undertaking to the relief of the local rates. It was stated that the tramway undertaking has been written down to £931.000 and that it could be sold for £5,000,000.

Electrification Progress in Mexico

Electrification of an additional stretch of the mountainous section of the Mexican Railway between Cordova and Paso del Macho has been completed. Together with previously completed sections, a total of 65 miles between Esperanza and Paso del Macho is now electrified.

In the 65 miles of electrified line between Pasa del Macho and Esperanza, the road rises from about 1,500 to 8,000 ft. above sea level.

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Recent Bus Developments

Appeal Expected in Chicago

An appeal from the decision of the Illinois Commerce Commission granting a certificate of convenience and necessity to the Chicago Motor Coach Company for extensions of bus routes and refusing feeder bus routes to the Chicago Surface Lines will be prosecuted at once by the Surface Lines. The fact that the decision was handed down in the midst of the hearing of objections by the Surface Lines will be used as an argument. The commission took the stand that the Surface Lines could not use its special renewal and replacement fund for the purchase of buses and that it had no right to operate buses under its existing charter.

This order of the Illinois Commerce Commission, referred to in a previous issue of ELECTRIC RAILWAY JOURNAL, over-rode the demands of thousands of residents on the northwest side of Chicago and the desire of the majority of the City Council. In short, the plan for feeder buses for the Chicago Surface Lines system favored by citizens of the northwest side and the City Council was practically ignored by the commission is granting these certificates.

Those who favored feeder buses for the Chicago Surface Lines contended that the company would give service for a 7-cent fare with free transfer to the Surface Lines system, whereas the service by the Motor Coach Company would be at a 10-cent fare with transfers only to its other motor coach lines.

The Chicago Motor Coach Company started service immediately after the issuing of the order of the commission and John A. Ritchie stated that regular schedules would be obtained as quickly as possible. New bus routes ordered add 70 miles to the service of the Chicago Motor Coach Company, making the total 215 miles.

Hudson Valley Sells Bus Lines

Following a decision of the Delaware & Hudson Company to abandon the Hudson Valley Railway in its entirety and to give up bus transportation, the Hudson Transportation Company has been sold to D. H. Cowles, James McPhillips, and other business men.

The abandonment of the entire Hudson Valley line would have left Hudson Falls and Fort Edward without transportation facilities, and when railroad officials announced that no substitute would be provided, Mr. McPhillips and Mr. Cowles negotiated for the purchase. Mr. McPhillips has been chief counsel for the Hudson Valley Railway for some time.

The company will at once apply for franchises over Glen and Warren Streets at Glens Falls, Main Street at Hudson Falls and Broadway and East Street at Fort Edward. If the franchises are granted the company will acquire sixteen buses, each seating 29 passengers. It is also proposed to extend the bus system through South Glens Falls to Saratoga Springs.

The total investment will represent about $265,000 and stock will be offered to residents of the cities and villages to be benefited by the new line.

The Hudson Transportation Company was created as a subsidiary of the Hudson Valley Railway to provide bus service in place of trolley cars in the cities where railway service was abandoned last July.

Zone Cab Service in Minneapolis

The Zone Cab Company of Minneapolis, Minn., has been organized as a subsidiary of the Twin City Rapid Transit Company, which had previously acquired three companies, to furnish taxicab service at reduced rates under the zone plan. Definite bounds are set for the zone from the downtown district to outlying streets.

The Zone company will carry one or more passengers within this zone for 50 cents. Outside these limits the rate is 50 cents for 2½ miles, with an extra charge of 25 cents for each extra stop to take on or discharge passengers. The color of the cabs is brown.

No License Required for New Salt Lake City Vehicles

A decision has just been rendered by Harvey H. Cluff, Attorney General of Utah, to the effect that the electric coaches recently placed in operation by the Utah Light & Traction Company on its Fourth East line in Salt Lake City are not self-propelled vehicles for the operation of which licenses must be obtained from the secretary of state. Mr. Cluff held that the coaches now being used are not motor vehicles under the Utah statutes, and therefore are not subject to the law regulating and licensing motor vehicles. The attorney general calls attention to the fact that the Utah statutes define a motor vehicle as "any self-propelled vehicle except such as run exclusively on rails." The dictionary, he points out, defines the term "self-propelled" as "containing within itself the means of its own propulsion." As the trackless trolleys in question are not run by any power within themselves, but electrical current not of their own manufacture, the attorney general holds they are not motor vehicles within the meaning of the statutes.

Traffic Jams in Toledo Discussed

A movement to take interurban buses off the streets for loading and unloading passengers and to construct a short loop for interurban electric railways was started in the City Council of Toledo, Ohio, recently by Charles Hoover, Vice-Mayor, who protested against the serious traffic situation caused by parking of large buses in the downtown district. Out of the discussion a new interurban terminal may be developed. Nearly a score of interurban bus lines now operate into stations near the interurban terminal, but they use the streets for loading, unloading and parking.

Developments Expected on Geneva Line

The Geneva, Seneca Falls & Auburn Railroad is destined to go into the discard in favor of buses. This became evident recently from information given out by Lansing S. Hoskins of Geneva, N. Y. and from applications already received by the village boards of Waterloo and Seneca Falls for a franchise for the Geneva Railway Bus Lines, Inc. Proposed abandonment has aroused the anger of both town and village boards because of the enormous amount of work and expense incidental to removing of trolley tracks and special provisions made in paving West Main Street and construction of the Waterloo-Geneva Boulevard and other similar thoroughfares.

The Waterloo village board will have a public hearing on Oct. 22 to act upon the application of Attorney Hoskins for a franchise through the village for the Geneva Railway Bus Lines, Inc., and Seneca Falls village board will hold a similar meeting Oct. 19. It was explained before both boards that the line intended operating buses from Geneva east through Waterloo to the end of Fall Street, Seneca Falls. Application for a franchise through Waterloo township will be made soon.

The Geneva Railway Bus Lines, Inc., for some months past, have operated buses in Geneva city. If franchises are obtained, it is proposed to route buses over both the main highway, by way of Lake Street, Geneva, and the Border City town road, by way of North Street, Geneva.

Efforts to sell the Geneva road failed some months ago because none would assume the burden of $72,345 that the line owed the municipality of Geneva, Waterloo and Seneca Falls.

Would Use Buses on Lincoln Line

Application has been made by the Lincoln Traction Company, Lincoln, Neb., to the State Railway Commission for authority to abandon cars on its line to the suburb of Normal, and to substitute bus service. The immediate reason is the insistence of the city authorities that the company build a subway at the intersection of Sumner with Jefferson

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Avenue in order to give the latter an outlet to the northeast. As the company's lack of earning ability prevents it from getting new capital on reasonable terms it asks authority to quit the service. When the line was built it ambled through a part of the city where few houses were located, in order to reach the suburb. This district, between Thirty-third and Sumner and Thirty-eighth and South, still is thinly populated, but the buses would be so run as to traverse a section almost entirely without car service.

Marion Goes to Bus

After 34 years of continuous operation city electric railway service in Marion, Ohio, has ceased. Most of the men who have been employed as motormen, conductors and assistants will be retained in other departments of the Columbus, Delaware & Marion Electric Company, which ran the railway.

A system of buses operated by the Marion Rapid Transit Company, Inc., will provide transportation in the city. Eight buses are ready to start. Two will go on the east and west Center Street run and the others will traverse other scheduled routes with daily service until midnight. The franchise calls for twelve buses, which have been ordered but cannot be delivered until late in October. Sale of tickets for the new service has been large, more than 3,000 having been purchased in advance. These are mostly of 50 in a book for $3, but few of the 15 for $1 books are being taken.

Routes Authorized Along Jersey Shore

The New Jersey Board of Public Utility Commission has authorized the Atlantic City & Shore Railroad to operate three buses between Atlantic City and Ocean City through Ventnor and Longport. At the same time the board granted authority to the Reading Transportation Company to operate buses by way of the New Longport and Ocean City Boulevard between the two cities.

Knoxville Awaits Decision

No developments looking toward immediate action are recorded in Knoxville, Tenn., on the bus-railway franchise controversy. The Knoxville Rapid Transit Company, an independent transportation agency, opened up negotiations some months ago and made application for a franchise to operate an independent city-wide bus system. After no definite action had been taken on Aug. 22 the City Council accepted the withdrawal of that petition. Since that time, and for practically some time before that, the Knoxville Power & Light Company had been negotiating with the City Council with a view to establishing a bus service in co-ordination with its railway lines. As yet no decision has been made on this proposition.

Further Replacements in Green Bay

As soon as the plan of the Wisconsin Public Service Corporation to replace car service on the South Broadway line in Green Bay, Wis., with bus transportation is approved by the Railroad Commission, work will begin on tearing up the tracks, according to an announcement of C. R. Phenicie, vice-president of the company. The company was recently authorized to discontinue the 23-mile interurban line connecting Green Bay and Kaukauna. The Mather Street and the Duck Creek lines in Green Bay were abandoned some time ago and the bus service which was instituted has proved so satisfactory that there was no opposition to the plan to abandon the South Broadway line.

New Springfield Line to Open in November

The Springfield Street Railway, Springfield, Mass., expects to put in operation in November its Worthington Street bus line, for which the Department of Public Utilities has granted a franchise. Coaches of 29-passenger size will be run on this route, which is to replace the present car line with an eastern extension.

Parking Scored in Kansas City

A plan to remove the congestion in the downtown section of Kansas City, Mo., caused by intercity bus parking is being considered there by a sub-committee of the traffic committee of the Kansas City Safety Council and by operators of interurban and suburban buses. The question was raised following the introduction of an ordinance in the City Council which would restrict parking throughout the downtown district by buses operating in Kansas City.

It has been found through a survey that there are at least 50 independent bus lines operating between Kansas City and surrounding towns. Much of the blame for violation of parking and other traffic regulations is laid to unlicensed and unregulated buses. These lines are also cited as injurious to the business of regular licensed buses because they are cutting prices.

Several plans have been suggested for regulating the parking. No recommendation has been made by the committee.

Washington Company Wins Commission Order

An order enabling the Washington Railway & Electric Company to operate buses from Washington to Hyattsville Hills in competition with the R. L. May line has been issued by the Public Utilities Commission. This order supersedes the refusal of the Public Utilities Commission in May to grant the Washington Railway & Electric Company the right to extend the Rhode Island Avenue bus line to Hyattsville. The reversal of the order came about when the Washington & Potomac planned an interstate bus route, sending buses direct to Hyattsville Hills.

A local fare of 10 cents will be charged on the new routes with free transfers.

Only One Railway Line Left in Durham

According to the *Herald* of Durham, N. C., the versatile bus is crowding out the trolley cars—those faithful servers of the Durham public through many a fair, circus or baseball season. The Durham Public Service Company at present maintains a last gallant band of six trolley cars on its single line of operation, with a reserve of two for rush hours and special occasions. These are now receiving a new outfit of upholstered leather seats. The only car route now in use—from East to West Durham through Main Street—forces a double trolley line to remain through the business district, but according to the *Herald* the tracks will be removed when the buses have completely replaced the cars.

Services Extended in California Cities

A certificate of public convenience and necessity has been granted by the California Railroad Commission to the Los Angeles Railway to operate auto stage service in the cities of Los Angeles and Culver City. This will be an extension of the present service.

Certificate for Indiana Route Sold

Formal approval has been given by the Indiana Public Service Commission for the sale to the Indianapolis & Southeastern Railroad of the certificate of convenience and necessity formerly held by the Indianapolis & Cincinnati Traction Company for a bus route between Indianapolis and Shelbyville. The deal was made recently at a receivership sale by Will M. Frazee, receiver for the Indianapolis & Cincinnati Traction Company, the predecessor of the Indianapolis & Southeastern.

Alameda Bridge to Be Used Pending Tube Completion

The Key System Transit Company has been directed by the California Railroad Commission in a supplemental order to begin operation of its proposed bus service between Oakland and Alameda with whatever variation is necessary in the route prescribed by the commission in its previous order. At the time of the commission's hearings on this matter it was estimated that the Oakland estuary tube would be ready for service on Oct. 1, but it has since developed that the tube will not be completed as soon as was expected, and the city of Alameda and the Key System Transit Company have requested permission to institute the proposed bus service over Webster Street bridge until such time as the tube is completed.

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Financial *and* Corporate

Traffic Increase on Local Lines in Los Angeles

Traffic over bus and street-car lines of the Los Angeles Railway, Los Angeles, Cal., for the first eight months of the current year showed a moderate increase over the corresponding period of last year, while August traffic fell below the similar month of 1927.

The total revenue passengers carried by railway and bus lines, including half that of the Los Angeles Motor Coach Company, which is owned jointly with Pacific Electric Railway, was 169,567,659, compared with 168,487,567 for the similar period last year, a gain of 1,080,092. August traffic amounted to 20,323,589, as compared with 20,802,518 in August, 1927, a decrease of 478,929 passengers.

As evidence of the increasing popularity of the bus as a means of travel, traffic on the bus division, together with one-half that of the Los Angeles Motor Coach Company, increased 1,574,467 passengers or more than 15 per cent for the eight months over the similar period last year. On the other hand, railway traffic dropped from 158,146,954 to 157,642,579 passengers.

The passenger car-miles for the total system showed slight differences for the two periods. The various divisions traversed 24,889,224 miles for the 1928 period and 24,665,633 miles in the 1927 period.

Route-miles operated or the total distance one way of all routes increased from 203.11 miles as of July 31, 1927, to 204.71 miles for the railway system, and from 78.31 to 83.15 miles for the bus division together with one-half the motor coach company. Twenty-seven railways lines are now operating compared with 25 a year ago.

Gary Railways Absorbs Interurban

The Gary & Southern Traction Company has been purchased by the Midland Utilities Company. It was announced at the same time that an extensive rehabilitation program would be launched at once.

While two new modern, steel, interurban cars are being built, however, the Gary & Southern Traction Company has made arrangements to lease interurban cars from the Gary Railways in order that service may be improved in the immediate future. Running time of 45 minutes between the two cities is proposed.

The Midland Utilities Company also controls the Northern Indiana Public Service Company, Gary Railways, Chicago, South Shore & South Bend Railroad and other public utilities located chiefly in northern Indiana and western Ohio.

Charles W. Chase, president of the Gary Railways, under whose direction the Gary & Southern Traction Company will be operated, said that the interurban railroad would be run as a separate property, but that it would have the benefit of the services of the management of the Gary Railways as well as representatives of the Midland Utilities Company.

Key System Holding Its Own

Gross operating revenue of the Key System Transit Company, Oakland, Cal., for August was $631,650, compared with $643,783 in August, 1927, a decline of $12,132. Expenses were reduced to $482,948 from $493,329 in August, 1927. Gross operating revenue for the eight months ended Aug. 30 shows a decline of $175,499 when compared with the corresponding eight months last year. Gross profit for August was $122,083, a decline of $2,926. Net profit for August of $8,786 compares with $17,806.

Straightening Out the Detroit United

Review of recent moves out of which new company will succeed old. Some points still to be settled

AFTER twice being postponed, the sale of the assets of the Detroit United Railway, Detroit, Mich., was held Sept. 12, when the property was bid in by the bondholders for $2,575,300. As indicated previously in the JOURNAL, the successful bidders were Edward W. Durner, Princeton, N. J., and James T. Harrigan, New York City, representing holders of the Detroit United Railway and the Detroit, Monroe & Toledo Shore Line securities.

Interurban rail lines to Jackson and Port Huron were not involved in the sale. Rail lines extending from Detroit to Flint, Pontiac, Farmington, Wyandotte, Monroe and Toledo were involved as were also a great number of bus companies, including the Peoples' Coach, the Star, Wolverine, White Star, Blue Goose, Highway and the Detroit & Toledo Trackless Coach companies and city bus services in Flint, Port Huron and Ann Arbor.

An order for the foreclosure of mortgages amounting to approximately $11,000,000 and the sale at public auction was signed on July 25 by Judge Charles C. Simons in the federal court on the petition of the Union Trust Company, Detroit, and the Central Union Trust Company, New York. The sale was conducted by William S. Sayres, Jr., standing master in chancery of the Federal District Court.

In a statement attributed to A. D. B. Van Zandt, public relations director of the properties, it was pointed out that the buyers by the purchase surrendered $7,500,000 of D. U. R. bonds and assumed $11,000,000 in liabilities in exchange for which they obtain a utility valued, in all, at perhaps $20,000,000.

The Detroit United Railway and the Detroit, Monroe & Toledo Shore Line Railway will be succeeded by the Eastern Michigan Railway Company after the sale has been confirmed.

Corporation Counsel Wilcox of Detroit announced after the sale that he would ask Judge Simons to amend the order to allow the city to purchase now the interest held by the D. U. R. in the city's D. S. R. purchase debt, and filed a check for $30,000 with Mr. Sayres. Municipal railway and D. U. R. auditors have been checking the records of the two organizations to establish the reason for the difference between the equities.

According to the records the city still owes $11,080,000 on its purchase contract by which the city took over the local Detroit lines and the city records show that of this amount only $30,000 is held free and clear by the D. U. R., the other $11,050,000 being held by owners of D. U. R. securities. The D. U. R. receivers, however, contend that the railway holds an equity of $161,000.

In 1924 the Circuit Court ruled that the outstanding purchase debt was $15,880,000, and that payments should be applied on $15,850,000 in outstanding Detroit United Railway bonds. The remainder, it is the city's contention, is the Detroit United Railway equity. The exact amount owed on the contract under which the Department of Street Railways at Detroit took over the city properties of the D. U. R. is now $11,225,766, against which there are bonds of $11,051,420.

William S. Sayres, Jr., standing master in chancery, stated that he did not reject the city's bid for the D. U. R.'s interest in the purchase contract with the city, but that he was merely carrying out the federal court's order in accomplishing the sale and took the bid under advisement to be submitted to the court for confirmation. The terms of the court mandate ordering the sale made it necessary for him to submit all bids to the court for confirmation.

Since the sale the Detroit City Council has informally approved two alternative plans suggested by Mr. Wilcox, by which the city might assume its outstanding debt of $11,000,000 to the D. U. R. The formal adoption of either plan will depend, Mr. Wilcox said, on the outcome of the sale of the D. U. R.'s assets.

The first plan proposed by the corporation counsel was the refinancing of the city's debt to the D. U. R., whereby the interest rate could be reduced from the present 6 per cent to 4½ per cent by special arrangement with the banks.

The other plan calls for submission to the voters in November of an $11,000,000 bond issue to cover the indebtedness.

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Through agreement of the D. U. R. reorganization committee, the properties of the Department of Street Railways at Detroit, operating the local municipal railway lines there formerly included in the system of the Detroit United, were segregated from others of the D. U. R. to permit the city to bid on the equity held in the railway by the D. U. R. In addition to the equity, the remainder of the $11,000,000 purchase price is in bonds on which the D. U. R. pays 4½ per cent interest, Mr. Wilcox said.

The Department of Street Railways at Detroit owns approximately $3,700,000 of the D. U. R. bonds in the latter's sinking fund, he said, and this amount would be returned to the city if the bond issue is passed, being credited against the purchase price of the property.

Commission Sanctions Reorganization Plan

Governor Fred W. Green of Michigan and a majority of the State Public Utilities Commission have approved the proposed reorganization of the Detroit United Railway over the protests of Sidney E. Doyle, the commission chairman. The Governor said:

This reorganization is among the stockholders themselves and is not a merger that might injure the general public. I find that overhead expenses are to be reduced from $600,000 to $200,000 and many other economies are planned.

Mr. Doyle suggested refinancing by preferred stock instead of bonds. He pointed out that should the company by chance default again in payment of interest on bonds, it is headed for a costly receivership, while purchasers of stock are entitled to receive returns only when they have been earned. Commissioner Doyle said:

Under this reorganization, capital stock of the D. U. R. totaling $15,375,000 is washed away. General creditors to the extent of $2,000,000 will not receive a cent. Bondholders, under a first mortgage, must give up their interest and part of their principal and be content with the balance in bonds secured by a second mortgage. The capital stock of the Detroit, Monroe & Toledo short line, totaling $2,581,000, is lost. Holders of first mortgage bonds valued at $3,000,000 must surrender $1,200,000 and take the balance in second mortgage bonds.

To me this is appalling. We cannot help what has been done in the past in good faith, but we can be careful of the future. When we approve an issue of stocks and bonds we must have in mind the protection of the public and the protection of investors.

The reorganization plan was first submitted two weeks ago at a meeting of three utilities commissioners. Mr. Doyle was not present. After listening to an outline of the plan, the three commissioners approved it. Their order, however, was recalled by the Governor when Mr. Doyle protested. Commissioners Samuel Odell, James Bice and Robert H. Dunn remained steadfast, declaring that the refinancing is the only way out of the D. U. R. receivership tangle.

Statistics of Abandoned Utah Interurban

The Boise Valley Traction Company, which owned and operated a street railway system in Boise, Idaho, and an interurban railway connecting Boise with Nampa, Caldwell, Middleton and other communities in the Snake River Valley, suspended last May. Electric power for the operation of the lines of the company was purchased from the Idaho Power Company. A statement of earnings of the company for the year ended Dec. 31, 1927, compared with the three previous years, follows:

	1927	1926	1925	1924
Gross earnings from operation	$192,238	$234,450	$246,619	$250,627
Operating expenses, including taxes	219,434	241,380	252,296	258,989
Net earnings from operation	$27,196*	$6,930*	$5,677*	$8,362*
Other income	325	14	17	.....
Total income	$26,871*	$6,916*	$5,660*	$8,362*
Interest on bonds and notes	85,700†	85,700†	85,700†	85,700†
Other interest and deductions	13,958	14,803	17,001	15,385
Balance	$126,529*	$107,419*	$108,361*	$109,447*
Renewal and replacement reserve	3,134	6,140	61,40	6,140
Balance	$129,663*	$113,559*	$114,501*	$115,587*

*Deficit.
†This represents twelve months interest on $750,000 ten-year 5 per cent mortgage notes and $964,000 Boise & Interurban Railway, Ltd., first mortgage 5 per cent gold bonds. No interest on the former issue has been paid since Jan. 1, 1923, and interest on the latter issue was defaulted April 1, 1923

The estimated population and number of communities served by Boise Valley Traction Company as of Dec. 31, 1927, the miles of track then in use, and the total number of passengers carried and certain other traffic data for the twelve months ended Dec. 31, 1927, compared with the two previous years, are given in the following table.

	1927	1926	1925
Population served	40,000	40,000	37,000
Communities served	7	7	7
Passengers carried during twelve months	888,371	1,261,614	1,670,878
Car-miles	770,032	934,554	953,843
Car-hours	49,117	70,278	72,094
Average number of cars operated	8	12	13
Miles of electric railway (single track equivalent)	64*	69*	83

*Decrease reflects certain track abandonments.

recommended that the line be dismantled and the equipment sold, pointing out that at least $461,000 would have to be spent to improve the line and put it in first-class operating condition.

Sale of Puget Sound Electric Railway Recommended

Following the filing of a petition in federal court by Attorney Scott Z. Henderson, receiver for the Puget Sound Electric Railway, Tacoma, Wash., recommending that the property be sold, Federal Judge E. E. Cushman set Oct. 8 as the date for a hearing on the petition. Mr. Henderson stated that continued operation of the Seattle-Tacoma interurban by the railway will benefit neither the owners nor the creditors. Attached to his petition was a statement showing that the line was operated at a loss of $455 between Feb. 21, when Mr. Henderson was appointed receiver, and Aug. 31. This did not allow for depreciation, amortization, interest requirement or dividends.

Revenue for the period was $270,060 and operating expenses were $241,603, leaving a balance of $28,456. However, taxes to the amount of $28,855 accrued and interest amounted to $26.66, resulting in an actual loss.

Henry L. Gray, court appraiser, places a value of $489,541 on the properties of the company, assuming that operation will be discontinued. This is $5,287,824 below the book valuation of the company, given as $5,777,365 in the receiver's report filed with Judge Cushman on June 9.

Mr. Henderson was appointed receiver of the line following the attempt of the holding company to collect on a mortgage, payment on which was long overdue. Following his appointment, he

Abandonment of Two Mile Line in Oregon

Permission has been granted the Oregon Electric Railway by the Interstate Commerce Commission to abandon its Woodburn branch line in Marion County covering a distance of 2.3 miles. The main line of the company extends from Portland to Eugene, Ore. The branch to be abandoned was constructed prior to 1910 to furnish a connection between the main line and Woodburn. From 1923-1927 this branch has shown a steady decline in both passenger and freight traffic. It was the opinion of the commission that the present and future public convenience and necessity permitted the abandonment.

Houston Reports Deficit

The Houston Electric Company, Houston, Tex., after deducting operating expenses, 8 per cent for income on investment and 4½ per cent for depreciation, reports for August a deficit of $22,889. From Jan. 1 to Aug. 31 the deficit totaled $129,550, and for the twelve months' period to Aug. 31 the total deficit was $149,271. The gross earnings for the Houston Electric Company for the year ending Aug. 31 were $269,015. Of this amount, $52,688 came from bus operation and $216,327 from street cars. The company has spent $6,681 for replacements so far this year, the report states.

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Book Reviews

Principles of Transportation

By Drs. Emory R. Johnson, G. G. Huebner and G. Lloyd Wilson. Published by D. Appleton & Company, New York. 815 pages. Price $5.

The authors have brought together for the first time, and within one book, an account of the services of all four kinds of carriers; those by railways, highways, waterways, and airways, treating all four agencies both as separate services and as parts of a co-ordinated system, but the different branches of transportation are discussed separately.

The greatest part of the book is devoted to railroad transportation. The authors have stressed the services rendered, and have considered government regulation. The war has completely changed the outlook of railroads. With the passage of the Transportation Act of 1920, the attitude has become one of consolidation and co-operation.

The war also brought to the fore the development of the automobile and truck as a useful arm of transportation. The automobile is still revolutionizing transportation in a manner that is not immediately apparent. It is bringing transportation to one's very door instead of at recognized terminals. It has already offered formidable competition to electric railway transportation and at present regulatory methods are being made by every state.

Aviation is still in its early stage of development and it is impossible to conceive to what extent it will supplant the other means. It has already attained a definite place as a useful transportation agency.

Of particular interest to men engaged in the local transportation field is the fact that the book brings out that the different agencies of transportation bear a complementary as well as a competitive relation to each other. It not only lays down the broad principles but provides abundant facts on every element of transportation problems. It shows the vast possibilities for a gradual development of a universal transportation system which will unite every farm, home, and factory with every other farm, home, and factory in the country.

New Publications

Spoor- en Tramwegen, Vol. 1, No. 1. Published every two weeks in The Hague, Holland. Editor, S. A. Reitsma.

This is the latest railway paper, and its first issue is dated July 10, 1928. The editor admits that there are many at present, but thinks there is a field for still another, to be published in Dutch and to take up both trunk line and street railways. In Holland and the Dutch East Indies, much is certainly being done. The leading article in this first issue, and to be continued in later issues, is a discussion of the economic gains of railway electrification. Particulars and maps are given of some of the European installations.

Principles of Inland Transport

By Stuart R. Daggett, Harper & Bros., New York. 705 pages. Price $4.

While the greater part of this book is devoted to traffic matters, such as routes, rates and legislation thereon, common carrier liability and similar problems, the author has been able to include chapters on the relations between the public and the railways in England, France and Germany, as well as on street and interurban railways, highway transportation, commercial aviation, waterways and some of the sociological aspects of transportation. The treatment is harmonious throughout, and the citations appear to be up to date. While the book appeals particularly to those interested in carrier liability and freight rates and legislation relating to them, it can be read with profit by anyone engaged in the transportation business.

Die Organisation des Fernnaldewesens der Deutschen Reichsbahn

Published by the Verkehrswissenschaftlichen Lehrmittelgesellschaft der Deutschen Reichsbahn, Berlin. 76 pages and 6 large plates. Price, 5 marks.

This is a treatise on the use of the telephone and telegraph for dispatching and other company uses by the German Street Railway System. It explains in simple language to the user of this apparatus the principles of its employment from a non-technical standpoint. The author is one of the responsible officers of the company, located at Halle.

One Hundred Years of American Railroading

By John W. Starr. Published by Dodd, Mead & Company, New York. 336 pages. Price, $3.50.

This is the story of the rise and growth of American railroads, just now celebrating their centenaries. Few realize, when they think of the enormous systems of railroads which now span our country, that a century ago the country itself was largely untrodden wilderness and would still be largely that were it not for the railroads.

In presenting this study the author describes in the first chapters the early engines, roadbeds, equipment, and the beginnings of the first two railroads, one in Massachusetts and the other in Pennsylvania. He then follows with an account of the beginnings of the Baltimore & Ohio, the Erie, and the New York Central Railroads, the earliest railroads in point of continuous service.

In separate chapters, he takes up the early roads of the different sections of the country, devoting whole chapters to some of the most important ones—the Pennsylvania, the Illinois Central, and the Atchison. In his final chapters, he devotes space to recent improvements such as modernization of equipment, installation of safety brakes, development of luxurious parlor cars, dining cars, and special "crack" train service. In his final chapter he summarizes the ideas as expressed by leading railroad executives of the place the railroads will hold in the country's future growth.

Why Men Fail

Edited by Morris Fishbein and William A. White. The Century Company, New York, N. Y. 344 pages. Price, $2.

Startling as its title may sound and extraneous as the subject may seem in the columns of ELECTRIC RAILWAY JOURNAL "Why Men Fail," might be read profitably by a very large proportion of the men engaged in this industry, or, for that matter, in practically any industry. For here is an exhaustive investigation and diagnosis of the human being doing his work in the face of natural and unnatural handicaps. Here is a readable record of notable successes and pitiable failures, resulting in the first instance from the conquering of mental disturbances and imaginings, and in the second instance, from the inability to focus the mind and so develop a more healthy viewpoint.

In the hectic rush of modern living, in the stress and turmoil attendant upon wage earners' crowded hours, these opinions of eminent medical men, offered as practical helps, are stimulating and even inspiring—stimulating because much can be done by the individual in his own mind to improve conditions which on the surface seem hopeless, and inspiring because, as pointed out, the reward for the successful accomplishment of a hard task is "in a feeling of self-reliance that makes not only for happiness, but is a character builder."

The book deals with the home-made failures, "queer" failures, bluffers, and day-dreamers, and especially the so-called job misfits, those who are being repeatedly transferred from job to job, being fired or resigning. In a chapter on job misfits V. V. Anderson, refers to the definite social obligations on the part of business and industry to cut down this large army of maladjustments.

For years the forward thinking utility companies have been giving careful study to the employee—his endowments and possibilities both for the cause of business and for humanity. With competition in business growing and the complexities of living increasing, a more intensive study of this subject will be required in the future, for the right man in the right job is the secret of business success and life's success. As is pointed out in 'Why Men Fail," the job one fills may be made an inspiration and stepping stone for further advancement or a millstone around the neck which ultimately leads to ruin.

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Personal Items

Prince Made Honorary Chairman of Engineering Congress

Prince Chichibu, brother of the Emperor of Japan, has been named honorary president of the World Engineering Congress to be held in Tokio in 1929.

As patron of this gathering of international scientists, the Prince will take an active part in preparing for the Congress, which it is expected, will be attended by a large body of the most eminent American engineers, to receive whom the Japanese engineers are making lavish plans.

The Prime Minister of Japan will be the host at a dinner to the delegates, and other officials of the government will preside at functions being planned for the visiting engineers. Imperial Government Railway will furnish free transportation for the visitors.

Herbert Hoover is honorary chairman of the American Committee.

W. H. Woodin, Jr., Director of Research

William H. Woodin, Jr., son of the head of American Car & Foundry Company and of the American Locomotive Company, has been appointed director of research of the first-named company. Long study and practical experience in the plants of the American Car & Foundry Company have prepared Mr. Woodin for this position. His research and practical experiments in metallurgy have already resulted in decided improvements in several of the company's products. Besides his work in metallurgy his activities as a microscopist and as electrical engineer have already attracted attention. As research director it is expected Mr. Woodin will render invaluable service in the fields of buses and trucks.

J. F. Gilchrist, Commissioner, Heads New Company

Another defection from commission ranks into larger financial and business fields is seen in the announcement of John F. Gilchrist, chairman of the New York Transit Commission, assuming the presidency of the newly organized Consolidated Indemnity & Insurance Company with offices at 475 Fifth Avenue, New York City. Mr. Gilchrist has denied reports to the effect that he would resign from the transit commission.

Back in 1897 Mr. Gilchrist was in the insurance business but relinquished it in 1908 to become under-sheriff of New York County. Later when the present Governor of the state of New York was elected sheriff he retained Mr. Gilchrist as under sheriff and the latter served another term in that office under Governor Smith's successor. When the Hylan administration was ushered in Mr. Gilchrist was appointed commissioner of licenses and still later became a member of the board of purchase. In 1923 he was named a member of the State Tax Commission.

Mr. Gilchrist has been more prominent in the transportation regulatory field in which he made his formal entrance in April, 1926, when Governor Smith appointed him chairman of the New York Transit Commission for the long term of nine years to succeed George McAneny. Other appointees at the time were Leon G. Godley and former State Senator Charles C. Lockwood, both of Brooklyn. The appointments of Mr. Gilchrist and of Mr. Lockwood were immediately confirmed by the Senate on motion of Senator Knight.

Mr. Gilchrist came in after the expiration of the old transit law and under the reorganization of the state government as provided for in the Hughes plan the transit commission became a bureau within the new public service department. It has regulatory functions similar to the public service department proper, but is confined in its jurisdiction to transit in New York City.

Mr. Gilchrist was born in New York City in 1873. He was educated in the public schools and in a business college. Early in his career he worked for the Thomas J. Pope Sons' Company.

Homer Loring in Textile Business

"Here's a Good Man Open for Big Offer" is the way the New York *Times* of March 11, 1928, announced the resignation of Homer Loring from the chairmanship of the executive committee of the Boston & Maine Railroad. The press of Oct. 10 tells the story on the "doctor of railroads" entering the textile field. Mr. Loring, who found an outlet for his constructive genius in rehabilitating the Boston & Maine Railroad, is to be president of the newly formed Merchants & Manufacturers', Inc., a corporation which plans to buy and operate converting houses in the North and the South.

In the long list of achievements to his credit can be included his fostering the campaign in behalf of the holders of the securities of Massachusetts electric railways in 1918. As chairman of the Association of Massachusetts Street Railway Security Owners Mr. Loring directed an educational campaign on behalf of the electric railways of that state. In this connection it is generally conceded that the association's activities were chiefly responsible for securing the passage of remedial legislation. He had done a big job as public trustee of the Eastern Massachusetts Street Railway and back of that is his service record as receiver of the Des Moines, Fort Dodge & Southern Railroad and his notable accomplishment with the Saginaw Traction Company in Michigan, which company had been losing money. Both companies were restored to conditions of prosperity.

During the four years that Mr. Loring directed the work of re-establishing the Boston & Maine Railroad he accepted no compensation. When the board accepted his resignation in the early part of the present year it voted him $100,000. This Mr. Loring accepted only to establish a fund for the good of all employees of the Boston & Maine.

Staff Changes in Vancouver

F. H. Fullerton has resigned from the publicity department of the British Columbia Electric Railway, Vancouver, B. C., Canada, to accept the western agency of a group of Toronto trade publications. L. G. Swann has joined the department. Mr. Fullerton took over the work of James Lightbody, well-known newspaper man, who for several years acted as public relations man for the British Columbia company.

W. J. H. PENMAN formerly traffic superintendent of Edinburgh Tramways (Scotland), has been appointed manager of Perth Tramways. He succeeds W. G. Snell, resigned.

OBITUARY

ROBERT V. PRATHER, secretary of the Illinois State Gas Association, Illinois State Electric Association and the Illinois Electric Railway Association since 1918, died suddenly in St. Louis on Oct. 7 while there to attend the world series baseball games. Mr. Parther had been secretary of the Public Utilities Commission, having been appointed to that office in 1914. He was nationally known in the utility field and in addition to the executive offices in the associations, he purchased with Ben Lyon the Kewanee Public Service Company and operated it for some time before selling it to the Illinois Power & Light Corporation. It was through his executive ability that the three associations, gas, electric and railways, were combined and it has been under his direction that one joint convention has been held each year since the consolidation. He had recently issued a call for a meeting of the presidents of the three associations to be held on Oct. 18 to decide the time and place for the convention of 1929.

WALTER W. SMITH, former superintendent of the New Jersey & Pennsylvania Traction Corporation, Trenton, N. J., died on Oct. 6. Mr. Smith left Brooklyn, N. Y., twenty years ago and was made superintendent of the Trenton company when that road was first built.

JOSEPH F. MAHER, former Trenton park commissioner and general timekeeper of the Trenton & Mercer County Traction Corporation, Trenton, N. J., died recently. He held the position with the railway for nine years.

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Manufactures and the Markets

Electrical Work in Philadelphia

An ordinance was introduced in the Philadelphia, Pa., City Council recently authorizing the director of city transit to make a contract, without competitive bidding, for electrical work in the Fern Rock subway with the Philadelphia Rapid Transit Company.

The proposed contract would amount to between $2,000 and $3,000, the lessee of the subway to furnish all labor and materials at cost, plus "a proper percentage for overhead."

The work includes connecting the machinery in the terminal shops and other buildings to modify the lighting where necessary. This ordinance was referred to the transportation committee.

$17,146,500 for New York Subways

The Board of Estimate of New York, N. Y., has approved appropriations totaling $17,146,500 for the construction of new subway lines and improvements to the city's independent subway system, and along with the appropriations approved contracts for the work that had been prepared by the board of transportation.

The largest item was $6,490,000 for the construction of a section of the Bronx subway. The Larocca Construction Corporation was the lowest bidder and the contract was approved.

The next largest item was $5,943,000 for the Schermerhorn Street, Brooklyn, route, the section running under Schermerhorn Street to Bond Street. The Necaro Company, Inc., was low bidder and the board voted approval of the contract.

The contract for the Smith Street-Ninth Street route in Brooklyn, for which $3,145,000 was voted, was obtained by the Cornell Contracting Company. The work calls for the construction of express tracks under Prospect Park and private property near Prospect Park southeast to Terrace Place; and local tracks under private property on Howard Place and Prospect Avenue from Windsor Place to Terrace Place will be built.

For station finish work on three Manhattan stations $393,000 was voted and the contract with the Woodcrest Construction Company was approved.

The Board of Estimate appropriated $608,500 for the installation of tracks and contact rails on Manhattan routes, the contract going to B. T. & J. J. Mack, Inc.

An item of $317,000 for the installation of sewers and appurtenances at the Concourse yard in the Bronx was voted and the contract for the work, obtained by James O'Connell, was also approved by the board.

The Lumber Manufacturing Company has obtained the contract for $35,000 for untreated ties and contact rail protection board for which an appropriation was voted.

The Eppinger & Russell Company obtained a contract for $92,000 for similar lumber and Charles Mead Company received a $225,000 contract for station finish work on Manhattan routes.

The Board of Estimate at the same time approved the proposed Queens Boulevard subway in Queens and it now remains for the board of transportation to prepare plans and advertise for bids.

Buying Methods Being Studied

With a view to checking up the reported wide-spread change in purchasing methods during the past ten years, the Institute of Economics is making a study of "hand-to-mouth buying." Purchasing agents are being asked how far ahead their company has been in the habit of placing orders for two of the more important commodities purchased in 1914, 1918, 1922, 1924, 1926 and 1928; what proportion the approximate average inventory for those years has been of the year's needs; whether there has been any important change in inventories carried in proportion to annual requirements; whether there has been any definite improvement in the company's purchasing technique during the past five years; whether the company is buying more frequently and in smaller quantities, and, if so, why these things are being done.

$120,000 Improvements for Gary & Southern Traction

In announcing the purchase of the Gary & Southern Traction Company, Crown Point, Ind., the Midland Utilities Company, Chicago, Ill., made public an extensive rehabilitation program to start at once. The sum to be invested in new cars, improvements in roadbed and improved electric facilities, including a new electric substation and additional power connections, will total $120,000. Two steel interurban cars have been ordered.

Plans for the new cars, which will replace the heavy, two-man equipment now operated over the line provide for a seating capacity of 45 passengers with individual plush-upholstered chair seats. The floors of the cars will be covered with colored rubber tile to harmonize with the interior finish of mahogany and ivory. The cars will be equipped with dome lights and a 13-seat smoking compartment arranged in the Pullman style so that passengers will not have to pass through it to enter the body of the car. Both cars will be the light weight single-end, one-man type.

Improvements to the right-of-way will include complete rehabilitation of the track and pole line between 45th Avenue, Gary and Crown Point. The present rail, owned by the Gary & Southern between the Little Calumet River and 45th Avenue on Broadway, Gary, will be thermit welded, re-tied, re-surfaced and re-lined. In addition to this work, which is to start immediately, a new substation will be built and feeder lines installed to interconnect the company's power system with that of the Gary Railways.

New Cars for St. John

Four new cars of the one-man motor, passenger, city type, have recently been placed in service by the New Brunswick Power Company, St. John, New Brunswick, Canada. These double-end, single-truck cars are 31 ft. long, 8 ft. wide, and seat 30 passengers. The bodies are of semi-steel construction with steel sides and dashers, arch roofs, and folding end doors. The seats are leather upholstered rotating pedestal chairs. The lighting is done by indirect dome type fixtures. Additional features are given in the following specifications:

Length over all	31 ft. over bumpers
Length of body posts	20 ft.
Truck wheel base	7 ft. 6 in.
Width over all	8 ft.
Rail to trolley base	11 ft. 6 in.
Window post spacing	30 in.
Body	Semi-steel, with steel sides, dashers and letterboards
Doors	End, folding
Brakes	Hand brakes only
Armature bearings	Plain
Axles	M.C.B.
Car signal system	Faraday high voltage
Conduit	All motor leads in rubber tubing inside of car
Control	Westinghouse K-6
Couplers	Brill
Curtain fixtures	Roller curtain behind motorman and conductor
Curtain material	Pantasote
Energy-saving devices	Economy Electric Devices Company
Fare box	Cleveland No. 2
Finish	Enamel, Sherwin Williams, Old Dutch Exterior
Floor coverings	Tuco Flexolith composition, red
Gears and pinions	Tool steel, noiseless gear
Glass	Double strength, set in rubber core tubing
Hand brakes	Peacock
Hand rails	Nickel plated
Heaters	General Electric, Calrod element
Headlights	Golden Glow
Headlining	Beaver board
Interior trim	Oak and whitewood
Journal bearings	Plain, babbitted
Journal boxes	Brill
Lamp fixtures	Safety car lighting fixtures, 12-in. domes in roof
Motors	Westinghouse 101-B-2, inside hung
Painting scheme	Persian Scarlet below belt rail and letterboard. Cream, on window stool, drip mould, both continuous around car, and window posts between same also door posts. Doors and sash, dark red. Roof, slate.
Roof type	Arch, covered with tongue and grooved narrow spruce board ⅞ in. thick, 10-ounce duck in one piece.
Safety car devices	Keystone stop-light system
Sash fixtures	O. M. Edwards, sash locks, rack and compression rollers
Seats	Hale-Kilburn, Type 900-rotating chairs, 8 per car. Longitudinal seats in opposite corners of car (door side) with small 24 in. seats in other opposite corners.
Seat spacing	30 in. centers
Seat material	Solid leather
Steps	Folding, operating with door
Step treads	Mason safety, lead filled
Trolley catchers	Ohio-Brass
Trolley base	Ohio-Brass, Form-4
Trolley wheels	Holland Trolley Supply, type H
Truck	21-E-Brill single truck
Ventilator	Utility honey-comb; Railway Utility Co.
Wheels	Rolled steel, No. E-T33. Contour-F-3-B-I, 33 in. dia. Standard Steel Works

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No Steel Equipment for Brooklyn "L" Cars

A request by the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., for approval of the expenditure of $1,200,000 for steel undercarriages to be installed on wooden cars now used on its elevated lines was turned down by the Transit Commission. The decision was taken to mean that the commission is committed to the speediest possible elimination of this type of car on elevated lines.

Granting of the request, engineers of the commission said, would have meant the adding of twenty years to the life of the average wooden car now in use on the lines. The company estimated the cost of equipping 150 cars with steel undercarriages at $8,000 a car.

Members of the commission's engineering staff are known to feel that merely equipping wooden cars with steel undercarriages will not prevent the telescoping in cases of collision. Experiments which have been conducted by combined engineering groups have been directed toward development of steel cars heavy enough to prevent telescoping, yet light enough to impose no undue strain on elevated structures and to remain upon the rails in case of collision.

South Shore Freight Station Opened

The rapid growth of carload freight business between Chicago and nearby Indiana cities has necessitated the establishment of a new carload freight station at Hegewisch, Ill., by the Chicago, South Shore & South Bend Railroad. The new agency, opened Oct. 1, will handle all carload freight formerly shipped and received at the Kensington (115th Street) Station. H. C. Larsen has been appointed freight agent in charge.

The Growing Need of Terminal Electrification

The Westinghouse Electric & Manufacturing Company has just released a new publication on the subject "The Growing Need of Terminal Electrification." This publication points out the need for rapid and clean suburban transportation and shows why the steam railroads are in a position to furnish this type of service and why the public is willing to pay higher rates for it. The advantages to the railroad of suburban and terminal electrification are described. Among others the following examples are cited:

The Long Island Railroad operates 1,100 electric trains daily—many of eleven cars each—bearing 130,000 passengers.

The Pennsylvania Railroad, at Broad Street Station, Philadelphia, reduced train movement 16 to 20 per cent by electrification and increased the terminal capacity 12½ per cent.

The Illinois Central Railroad, by electrification at Chicago, reduced running time between terminals 10 to 24 per cent.

The Chicago, South Shore & South Bend Railroad doubled its gross revenue in less than two years of electric service.

Completing Rehabilitation in Kansas City

One of the most comprehensive general rebuilding programs ever carried out by a city transportation property is being completed by the Kansas City Public Service Company, Kansas City, Mo. This plan called for an expenditure of $6,600,000 over a period of three years for rebuilding track and special work, and remodeling and rebuilding the rolling stock. The expenditure of this money will have been completed in a two-year period instead of three years, or one year ahead of schedule.

The construction department has completed the construction of 46 miles of tangent track as originally planned and has only a few special work replacement jobs remaining to be done.

The equipment department is at present winding up its schedule of two rebuilt cars per day, in putting final touches on 29 single-truck 400 and 500 type cars. All passenger cars are now in one-man service, this part of the work having been consummated when the 200, 400 and 1,000 car jobs were completed the latter part of June.

The total increase in the number of men employed during this rehabilitation period was approximately 740 over normal requirements.

$1,000,000 Program at Detroit Being Concluded

The Detroit Department of Street Railways at Detroit, Mich., is rapidly drawing to completion the $1,000,000 repair program which has been conducted during the current season and which covered tracks in widely scattered sections of the city. Several main traffic arteries have been repaired and rebuilt and the resulting new roadbeds make riding on the cars smoother and traveling easier for the motorists. The proposition to relieve the railway department of the responsibility and expense of paving between tracks was voted down when it was submitted to the electors.

The present program includes the rehabilitation of the Grand River line from Meyers Road to the new city limits in Redford. This work is to be completed before the end of the present construction season. New ties, rails and paving are to replace the long stretch of interurban construction.

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

	Oct. 9, 1928
Metals—New York	
Copper electrolytic, cents per lb.	15.025
Copper wire, cents per lb.	17.125
Lead, cents per lb.	6.5
Zinc, cents per lb.	6 60
Tin, Straits, cents per lb.	49.625
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.40
Somerset mine run, f.o.b. mines, net tons	1.90
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.375
Central, Ill., screenings, Chicago, net tons	0.925
Kansas screenings, Kansas City, net tons	1.875
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.3
Weatherproof wire base, N.Y., cents per lb.	17.625
Cement, Chicago net prices, without bags	2 50
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10 8
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal	$0.5725

TRADE NOTES

Potosie Tie & Lumber Company, St. Louis, Mo., has purchased the Hobart-Lee Tie Company, Springfield, Mo. The purchaser is said to have involved $1,500,000.

N. L. Mortensen has been appointed chief engineer for the Cutler-Hammer Manufacturing Company, Milwaukee, Wis. T. E. Barnum, former chief engineer, has been appointed consulting engineer for the company, in which position he will be able to give uninterrupted attention to engineering problems and outside engineering relations.

Vanadium Corporation of America, 120 Broadway, New York, N. Y., has opened an office at 2245-2246 Oliver Building, Pittsburgh, Pa., under the direction of J. Alfred Miller, Jr., general manager of sales.

Van Dorn Electric Tool Company, Cleveland, Ohio, announces that E. J. Phillips, who has been selling Van Dorn products in Detroit, has gone to San Francisco to take over that territory for the Van Dorn company. His place in Michigan will be filled by his brother, George Phillips. J. F. Spaulding has been transferred to the Baltimore territory to fill the vacancy resulting from the transfer of Jack Beggs from Baltimore to the headquarters office in Cleveland.

ADVERTISING LITERATURE

American Manganese Steel Company, Chicago, Ill., has issued a booklet entitled, "Manganese Steel." This booklet contains a history, a description of the contents and a description of the use of manganese steel.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has recently published leaflet 20371, describing the type CH carbon breakers for automatic substations.

General Electric Company, Schenectady, N. Y., has issued bulletin 874B, descriptive of WD-200A arc welder, and bulletin 19E descriptive of CR 7006-D4 and D5 a.c. enclosed magnetic switches.

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Virginia Electric & Power Company Wins Coffin Award

THE Charles A. Coffin Award for 1928 was won by the Virginia Electric & Power Company. This, the most coveted honor in the industry, was presented in recognition of accomplishments toward improving service for the benefit of the public and the industry.

Among other accomplishments, modern equipment was provided. These cars, built by the American Car Company, have given excellent service and have been the means of reducing maintenance costs to new low levels.

The results obtained by the Virginia Electric & Power Company is positive proof that attractive and comfortable equipment increases passenger revenue. There is no greater aid to financial stability than Brill Modern Cars.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

BRILL MODERN CARS

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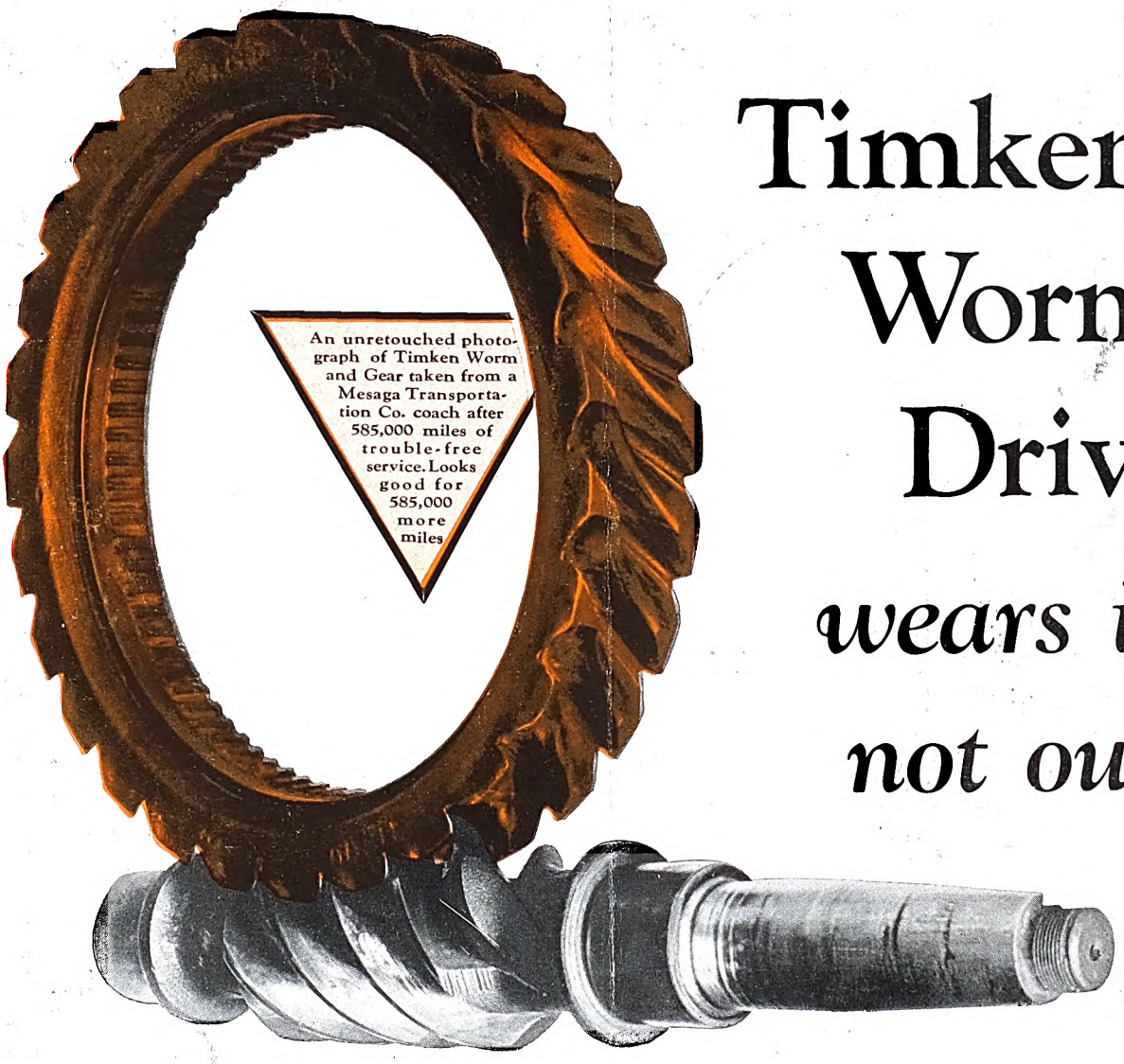

Timken Worm Drive *wears in not out—*

Many a veteran motor vehicle, when put through its periodical overhauling, discloses that the original Timken "F J" Worm and Gear is as good as new. Use does not lessen the high efficiency of Timken Worm Drive; nor can it ever become noisy.

Timken Worm Drive wears *in*—not out.

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

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MAINTENANCE AND CONSTRUCTION ISSUE

ELECTRIC RAILWAY JOURNAL

cGraw-Hill Publishing Company, Inc. OCTOBER 20, 1928 Twenty Cents Per Copy

Profitable Performance!

A hundred spirited horsepower Hall-Scott in a flashing 21-passenger A.C.F. Parlor Coach. Performance rivaling a 1929 passenger automobile. Ideal for high-fare express coach lines to exclusive suburbs. A revenue builder for interurban lines faced with private automobile competition.

Ask an A.C.F. representative to demonstrate this coach on your property. Be prepared to revise your present opinion of motor coach performance.

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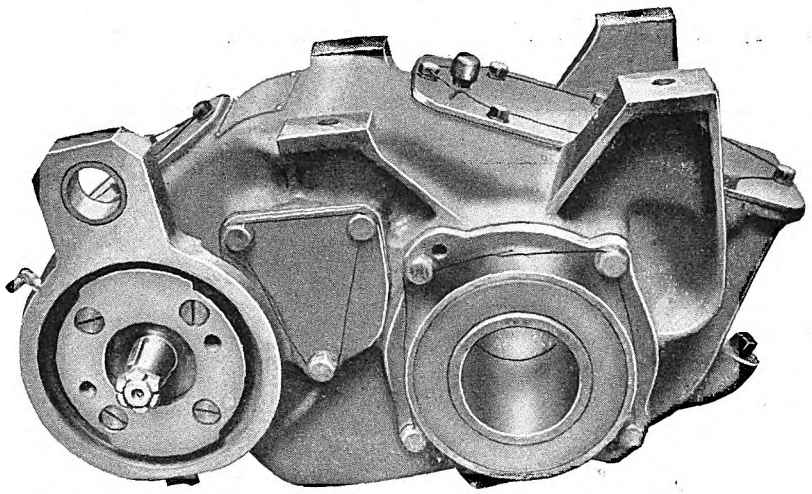

Quicker–

on the get-away

RAPID acceleration is needed nowadays to get through congested traffic, for no one likes to bring up the rear of the parade when signal lights flash "go". To hold and build more patronage, a quick get-away is essential.

The New W-N Drive

a product of Westinghouse and Nuttall engineering skill, is the solution to the problem of increased car acceleration. Its high ratio of speed reduction permits the use of light-weight, high-speed motors with their greater flexibility.

Constructed of heat-treated, hardened helical gears revolving on Timken roller bearings in a continuous bath of oil, contained in an oil-tight steel case, this new drive produces quiet operation free from maintenance and trouble.

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc. *Consolidation of Street Railway Journal and Electric Railway Review*
JAMES H. MCGRAW, *President* CHARLES GORDON, *Editor* LOUIS F. STOLL, *General Manager*

Volume 72 New York, Saturday, October 20, 1928 *Number 16*

Complete Agreement Exists Only in Defeat

"IF ELECTRIC railway men continue to wait for the 'last word' in new street car designs before making purchases they'll all be broke," emphatically declared one railway executive at the Cleveland Convention of the American Electric Railway Association held recently. His pronouncement was echoed by a score of other railway operators who appeared willing to admit that perhaps the final step in the development of new cars and auxiliary equipment was one destined never to be reached.

There was at least partial agreement also that many railway companies have put off too long making their own service tests with what has been available in modern transportation vehicles; experiments which could easily be justified in view of the continued loss of revenue using existing antiquated railway equipment. As bluntly stated by another railway man, "If we delay much longer making up our minds to try out new cars we'll have no passengers left to try them out on."

Railway properties that have courageously gone ahead with car replacement programs are finding that the sums so expended are returning them value received many fold. So satisfactory have been the results obtained on some of these properties that in several instances the investment has proved to be exceedingly profitable.

There is no denying the fact that while many properties are waiting for the accumulation of evidence concerning the returns to be obtained by the use of specific types of vehicles and auxiliary equipment, their revenues are decreasing—in some instances at a rate which eventually won't leave enough to act on the conclusions of other managements, much as they might then desire to do so. The time to act is before the remaining patronage of the smaller street railways has disappeared in the wake of the business already lost; to act while revenues are still sufficient to finance new equipment.

Constructive Criticism a Means Toward Better Maintenance

THERE are many ways of improving the working methods in the average electric railway shop. Frequently, however, the men responsible have become so accustomed to performing operations in a certain manner with a fixed equipment of tools that they find it hard to recommend changes that will alter the system. In one shop the general superintendent had each foreman visit another department of the shop and then make a report of methods that could be improved, new equipment that could be used to advantage and practices that could be used in his own department with benefit. The scheme resulted in some very helpful suggestions.

A week was given each foreman to make the inspection and report. A general list of points to look out for was furnished each foreman in advance. This included such items as material handling equipment, labor saving methods, safety precautions, arrangement of machines, routing of work, record system used, suggestions for decreasing idle time, handling of scrap, cleanliness of the department, etc. Many problems are common to the various departments and even though the material and work handled are quite different, the average foreman is able to grasp the fundamentals of the other fellow's department.

One result of great benefit was a tendency toward closer co-operation. Each man learned much about the work being done in other departments and so could appreciate more readily the reasons for delays and inconveniences with which he had previously been inclined to be impatient. The general knowledge gained was helpful to him in arranging his work to fit closer into the schedules of other departments and so to speed up the complete operation.

Inactive Stock Represents Potential Loss

EXISTENCE of slow-moving materials creates a problem difficult to control. All electric railways have many items of material in stock which though not entirely obsolete, may be made so on short notice by the replacement of old equipment on which it is used. The practice of ordering future requirements on the basis of previous requirements is one of the main causes for a surplus of slow-moving material. Orders for large quantities of material during temporary rush periods, as during the overhaul of a group of cars, is another cause for quantities of inactive stock. Equipment which is retired from active service and retained for possible emergencies, contributes another cause of frozen assets in the form of replacement parts on the storeroom shelves.

It behooves all who are in any way responsible for ordering, carrying and distributing stocks of parts to be continually on the alert to avoid the accumulation of inactive materials. However, to have material in stock to supply the demand only when needed and to have no surplus, is an impossibility. Despite the best of regulations, unusable materials will accumulate. In an address at the Cleveland convention, A. S. Duncan, assistant director of finished stocks of the Westinghouse Electric & Manufacturing Company, presented a comprehensive outline of the individual depreciation system of meeting this situation from an accounting standpoint. By means of this predetermined penalty system, it is possible to set up some method whereby inactive stock will be reduced to its actual book value so that in the eventual disposition of this stock, the losses will have been taken by easy stages instead of dropping suddenly from a 100 per cent book value to scrap. However, this system, though it enables the loss to be spread over a period of time, does not eliminate the loss itself. Once material is scrapped, the salvage value is rarely more than 1 per cent of the original value, except on non-ferrous mate-

This is the issue in October that is devoted essentially to maintenance and construction subjects

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rial, and even this small saving may be considerably reduced if the labor cost of salvaging is properly considered.

Slow-moving material can be disposed of in many ways to save a large part of the loss through scrapping. Much can be saved by the remodeling and reshaping of parts, and by the removal of usable equipment from obsolete assemblies. However, labor costs must be carefully considered in this method of salvaging. An important and often overlooked method of reducing apparently immovable stocks is by the interchange of standard parts with companies using the same or similar equipment. Opportunities exist for the sale or exchange of parts directly between operating companies. In too many instances these are not fully exhausted before taking the large loss involved in scrapping parts which though still entirely serviceable and in many instances practically new, have been made obsolete by the replacement of the equipment for which they were intended.

The Best You Can With What You Have

NO MORE forceful argument in favor of modernization could be found than the one contained in the brief of the Virginia Electric & Power Company, which won the Coffin Award. There the matter has been reduced to the basis of dollars and cents. That record, succinctly stated, is that as a result of the $3,800,000 spent between July 1, 1925, and Dec. 1, 1927, net earnings for the calendar year 1927 increased $441,651 over the twelve months' period ended June 30, 1925, or a return of 11.60 per cent before depreciation on the $3,800,000. That is tangible. It is conclusive. But best of all is the fact that the program of the company for bettering its condition was not presaged on this expenditure.

No sooner did the new management in Virginia begin to function than it set about doing what it could with what it already had at its disposal. It is true that betterment of public relations is dependent upon the improvement of physical property, but such betterment is not entirely dependent upon the spending of large sums of money. There is little reason to quarrel with the individual or the corporation that does its level best with what it has, but the public is quick to sense any disposition not to do the level best.

The program in Virginia did not contemplate wholesale replacements. Nor does any similar program need to contemplate wholesale replacements for its success. Cars and buses antiquated beyond recall were relegated to the scrap heap in Virginia just as they ought to be, but where salvage was possible rebuilding was resorted to with the desired public effect.

Of course, the expenditure of new money is desirable where it is available at reasonable rates, but much can be done pending the accession of such funds. There is concrete evidence in the Virginia case of the returns that may be expected where managements have the hardihood to look facts in the face. It is, of course, distasteful to moralize. But it is difficult not to do so when the preponderance of the evidence is so greatly in favor of the policy of doing the level best with the facilities that are at hand. Each of the Coffin briefs is replete with suggestions to this end, suggestions that do not contemplate the expenditure of large capital funds. Each company in the industry needs to examine its practices in the light of the accomplishments of the Coffin Award contestants of the past, but particularly in the light of the accomplishments of the contestants for the honors during 1928.

More and Better Tools Needed in Our Shops

CONSIDERATION by electric railway officials of the replacement of inefficient shop tools should take into account that it is quite generally conceded that the present favorable industrial situation and high wages are due to more general use of improved machinery. The worker is able to increase his production through use of more and better equipment and so he is more valuable to his employer. While America, no doubt, leads in the effective use of improved machinery it is indisputable that electric railway shops are woefully lacking in modern machine tools. The survey made by the editors of this publication in 1924 showed that 40 per cent of the machine tools used by electric railways were then more than twenty years old. With a few outstanding exceptions, there has been little improvement in this respect since that time.

While age alone cannot be considered as the determining factor for obsolescence, many improvements have been brought out in the past twenty years that increase the usefulness of machine tools and decrease time and labor needed. To decide if the equipment used at present is obsolete it should be compared with equipment that is available for the same purpose. If the new tool is sufficiently superior from a cost-reducing standpoint to make its installation a good investment then the equipment in use has become obsolete. Managers of progressive industrial concerns know that this is a sure means of increasing profits and will gladly borrow money at a normal rate of interest to earn a much greater return through ownership and use of the improved equipment.

Among electric railways, however, there is a decided reluctance to replace anything that may retain a few years of service. Master mechanics and superintendents of shops put up with inferior machinery rather than attempt to urge the economy of new tools with the general manager. Frequently they have no records of performance on which to base a real buying argument. This should be the first step. The performance of present tools should be checked and compared with that being obtained from modern tools doing the same work.

What Expenses Should Be Included in the Cost of Materials?

THE cost or price of materials should logically include all the expenses up to the time and point of use, including cost of purchasing and other expenses incurred in receiving, inspecting, storing and delivering materials to the point of use. This was the conclusion of R. A. Weston, special accountant of the Connecticut Company in an address before the Purchases and Stores Division at the Cleveland Convention.

A difference of opinion was evidenced by the lengthy discussion following this address. The fact was brought out that the value of materials and supplies is in no way increased by labor of officers and clerks, either in the purchasing agent's office, the storekeeper's office or auditing office, nor by labor of stock men handling material after it has reached its destination. There are, no doubt, many large companies that, due to their type of organization, must know the cost of maintaining these separate departments. On the smaller properties, where one official and his office force may cover one or more departments, it may not seem as essential to recommend a standard practice for arriving at an issue price of material and supplies. But on properties in which a central purchasing and stores organization functions for several subsidiary or associated interests, especially where mate-

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receive the same care given apparatus of less rugged construction and located in a more accessible position. Proper lubrication is one of the most important factors involved in caring for such motors to prevent failures in service.

While the "down-feed" motor was designed originally with the idea of using grease as a lubricant, present practice consists in so modifying the arrangements for lubrication that oil instead of grease can be used—this being advisable since experience has shown that longer life of bearings results when oil is employed. The part of the housing that clamps the bearings originally was made with a box for holding the lubricant. This box was placed either above only or both above and below the bearing while slots or "windows" looking into these boxes were made in the bearing itself.

Grease lubrication exclusively was intended when the motor was fitted with only a top grease box. In this case the plan was that the frictional heat of the bearing should melt the grease and bring it down through the "window" in the bearing to the shaft. When both top and bottom boxes were present it was intended that the lower box should be filled with oil before assembling the bearing. Thereafter, in use, the oil was to be fed to the shaft through a felt wiper one end of which dipped in the oil and the other end against the shaft. The felt was held in place by a spring.

Down Feed Lubrication Unsuccessful

This method of bearing lubrication was not generally successful for several reasons: first, because of the tendency of the felt to glaze; second, because the condition of the felt could not be inspected without dismantling the motor; and third, because when the felt became worn the steel springs cut the shaft, whereas if copper springs were used they lost their resiliency quickly and so did not function properly.

Due to the above-mentioned disadvantages, present practice in lubricating this type of motor consists in closing the bottom slot or "window" of the bearing and disregarding the bottom box entirely by casting the bearing solid on the bottom, thereby obtaining increased bearing surface. The top slot, originally of about ¾x3-in. size, is then increased as nearly as possible to the area of the horizontal cross-section of the box. By so doing better contact takes place between the waste and the shaft; likewise, the wider slot makes it easier to inspect the shaft. With these changes, oil can now be fed to advantage through the top window.

In packing the box, oil-saturated waste is first forced in tightly against the shaft, after which oil is poured on top of this waste; then more waste and more oil is added, finishing with a piece of waste at the top to which no oil is applied. This top waste, often called a "dust plug," serves as an auxiliary to the spring cover in keeping water and dirt out of the bearing. In packing, as much waste as possible should be forced into the boxes, but care must be taken that the cover closes tightly and that all strands of waste are inside the box; otherwise, oil will be syphoned from the box through the strands hanging over the side.

Various methods are in use for lubricating the bearings of "down-feed" motors. Sometimes felt is used to fill the bearing slot completely and the oil-saturated waste is then packed on top of this felt. Felt tends to glaze quickly and therefore this practice can not be looked upon with favor. Then again, grease is employed to fill the "window," above which waste impregnated with both oil and grease is packed, and more oil thereafter poured on top of this waste. The idea back of this method of packing is that, in case the bearing warms up, the grease will liquify to such an extent as to permit the oil to reach the bearing. Then when the bearing cools, the grease will solidify and once more hold back the flow of oil.

Another method involves the separation of the grease box into two parts, one of which is filled with oil, the other with waste. A wick connecting the two thereupon syphons the oil upon the waste. A grease cup similar to a "pin-oiler"—in this instance the pin being a ball that opens and closes the hole in the bottom of the oiler as the shaft rotates—has also been used. Placing a container filled with oil or saturated waste in the "grease" box, and having means for syphoning this oil into the bearing, either down the sides of the box or down a pipe through the center of the box, represents another practice. The fact that dirt can find its way into the bearing easily is an objectionable feature to each of the lubricating methods just mentioned.

Melbourne Moves Toward Noise Reduction

PARTICULARS of efforts being made in Melbourne, Australia, to reduce noise from electric car movement are given in a recent report by T. P. Strickland, chief engineer Melbourne Metropolitan Tramways Board. According to the report, as printed in the *Electric Railway and Tramway Journal,* the operation of any steel-tired wheel on steel rails must make a considerable amount of noise. The noise is greater than that of a railway train because the street car runs along paved streets, flanked by high buildings, and because the rails, except after a shower, nearly always are covered with grit, blown on them from the street. The non-resilient rail foundation, used in Melbourne, is also a material factor in increasing the noise. Smooth, hard pavements also appear to magnify it.

The noise between the tire and rail is increased by rail corrugation, which the Melbourne system is trying to keep down through grinding and by hardening the heads of the rails by the sorbitic process. Some recent track was laid on a continuous bed of timber with a layer of elastic material between the rail base and the timber. Another section is being laid on composition ties, and on another a noise deadening material is being placed under and alongside the rails. These trials are aimed to develop a track reasonably cheap to maintain and one which will not corrugate rapidly yet be as quiet as possible.

Experiments have also been conducted with various types of wheels and different types of gearing to reduce noise, but with no definite result as yet. Other experiments being tried are the replacement of brake pull-rods with wire ropes, with the object of removing a rattling part; the use of fiber washers in place of steel on all parts of the undergear where practicable, and the use of drum brakes. The latter have been applied to two worm-drive cars.

The author is of the opinion that some of these changes are effective but the practical results are masked by the effect of corrugations, the removal of which will eliminate the worst of the noise now caused by the tram cars.

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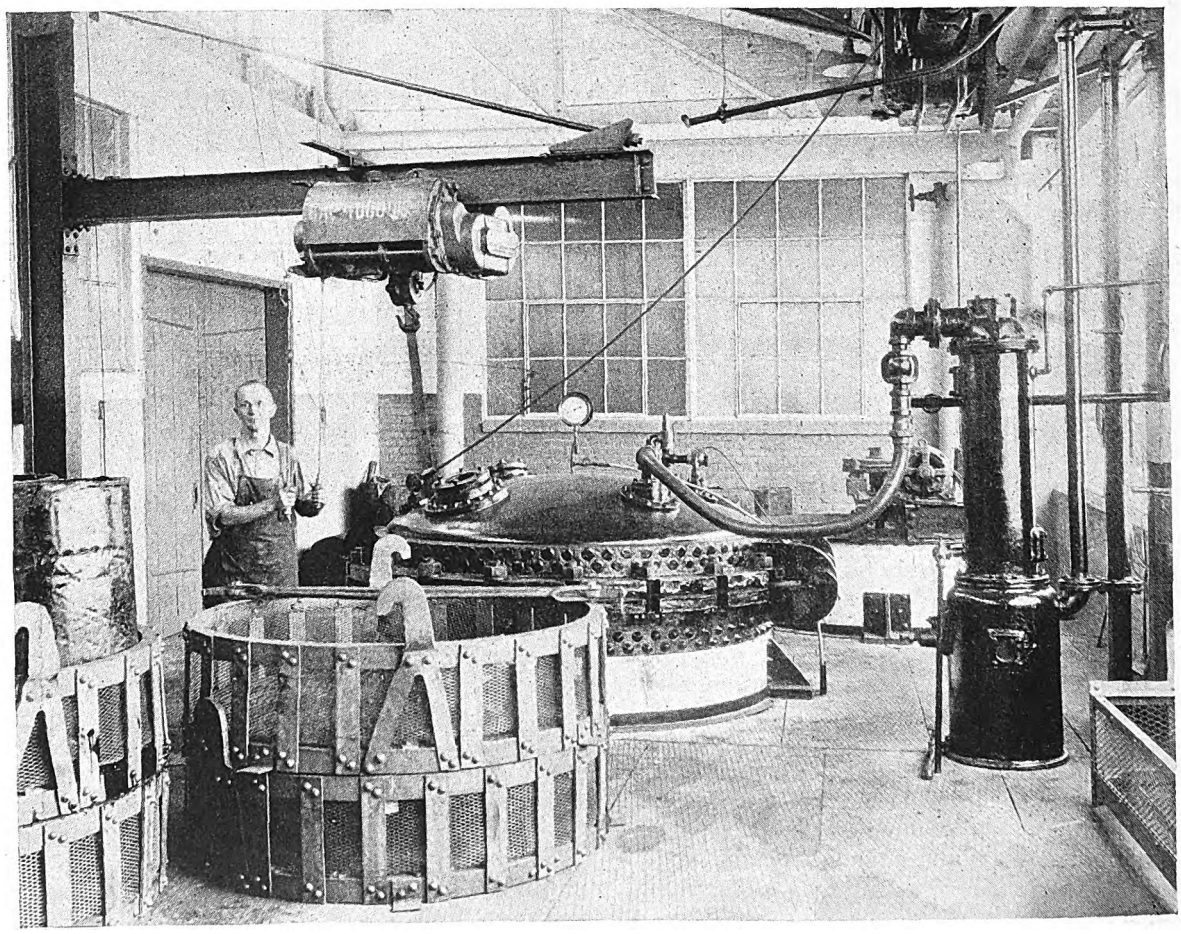
Careful Maintenance of Field Coils Pays

Terminals and leads of railway motor field coils are annoying sources of trouble. Proper attention to them and frequent inspection will reduce troubles greatly

By Jesse M. Zimmerman

Maintenance Sales Engineer Westinghouse Electric & Manufacturing Company
Chicago, Ill.



Vacuum outfit for impregnating field coils

PROPER maintenance of field coils is essential to good operation of a motor. Many motor troubles, such as flashing and overheating, may be caused by a weak magnetic field, but these can be corrected if proper repairs are made. The torque is proportional to the field strength times the armature current, so that a weak field must be compensated by an increased armature current if the same torque is obtained. The increased armature current distorts the main field to such an extent that flashing will be inevitable at the least fluctuation in voltage. The increased overload also causes the armature as well as the fields to run hot. This weak field is caused sometimes by reversed field coil lead connections. In many cases it may be caused by a portion of the turns in one or more of the field coils being short circuited due to poor insulation. In either case careful inspection and proper repairs will be profitable.

It is the standard practice of motor manufacturers to insulate, impregnate, dip and bake all railway motor field coils to form a perfect seal against moisture. This seal is obtained by impregnating with a gum, which must meet a rigid specification, with the aid of a vacuum impregnating tank. The coil is then insulated with treated cloth tape and surgical tape or cambric and mica

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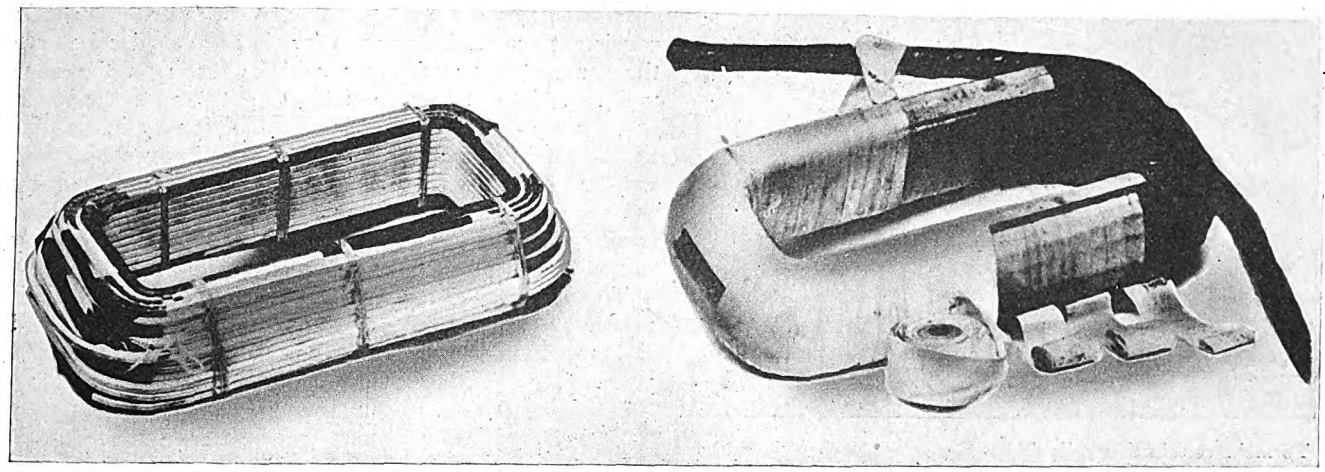


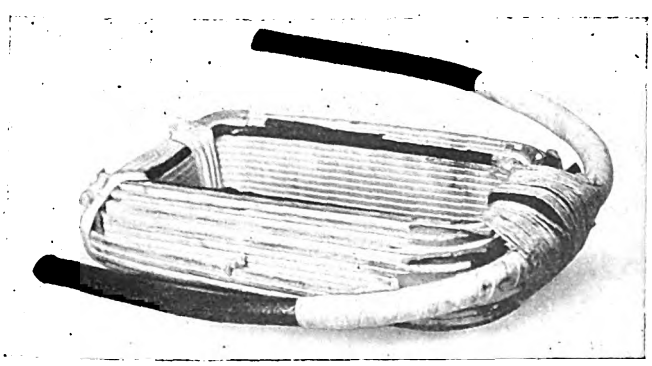
Fishpaper protecting strips should be used at the top and bottom of the coil and insulation should be stepped back when terminals are replaced by cable leads

tape, and asbestos tape, according to the application. Better results are obtained by using narrow tape because it permits narrower laps and forms smoother layers around the corners. The varnish can make a tighter seal where the laps are narrow. This increases the cost of the taping operation, but this is more than offset by the results obtained. Around the corners, the tape is "cut out" so it does not build up on the inside of the corners. The coils are dipped three times in a high-grade plastic baking varnish and baked thoroughly after each dip.

Field coil repairs can be divided into two classes: (1) External and (2) internal. External repairs, such as replacing terminals or coil leads, and insulation around the coil, can be done at a reasonable cost. If the internal insulation is in first-class condition it pays to make these repairs. After the external insulation has been removed the coil should be tested for short circuits. The cable leads should be retied and the coil reinsulated in the manner described in the preceding paragraph.

Operating data have shown that internal troubles such as short turns can be repaired permanently only by completely reinsulating the conductor, because the insulation around the conductor usually is badly charred. Removing the old insulation and reinsulating the conductor requires a large amount of labor and material, after which the coil must be rewound. The cost of performing this work will be as much as that of a new coil. In addition to this the quality of the copper and its cross-sectional area in places becomes questionable. In many cases these coils have given trouble in service, making it necessary to remove the motor from the truck to replace them.

It was the practice on old types of motors to solder terminals to the coil ends of all field coils, but cable leads are used now when the design permits. The field coils were connected after being assembled in the motor by jumpers held into the terminals with setscrews. Due to vibration the jumpers would work loose or break, thus causing an open circuit. This difficulty has been eliminated by soldering a piece of flexible cable directly to the ends of the field coil conductor and securely tying them to the coil body. These flexible coil leads are connected by soldering them into a copper sleeve connector. In this manner every possible chance of an open circuit in the field coil wiring is eliminated.



Cable leads should be tied securely before the coil is impregnated

The disadvantage of using terminals is that the terminal, like a toe, will have its stubs, resulting in poor contact with the field coil proper, thereby causing local heating. The terminals also form convenient handles for a workman to pick up a field coil and result in unnecessary strain on the soldered connection. If a field coil is handled by its cable lead the stress is put on the twine tying the lead to the coil and not to the soldered connection. However, field coils with cable leads should not be handled by the leads as it breaks the seal, thereby permitting moisture to enter the coil.

Terminals often break off due to vibration and it is very difficult to insulate these terminals properly when assembling coils in the motor due to the lack of space. Loose cable connections caused by screws backing out of terminals result in local heating and burning off of the leads. The only advantage that can be claimed for terminals is the ease of renewing field coils at outlying barns where soldering equipment may not be available.

The superiority of the cable lead construction lies in the uniformity (no breaks) of the insulation up to the ends of the leads. Cable leads are also cheaper than terminals. The connections between coils with cable leads are more accessible and hence are made better and more readily.

To make the leads as secure as possible, the start and finish copper in the coil, at the ends, is of such a length as to insure that the maximum length of insulated cable will be taped into the end of the coil. In addition to giving added insulation, this construction permits binding the leads firmly to the side of the coils, keeping the shocks and stresses away from the soldered connection.

Field coils having terminals can be changed over to anchored cable leads at a very low cost, if it becomes necessary to replace the terminals. This is done by re-

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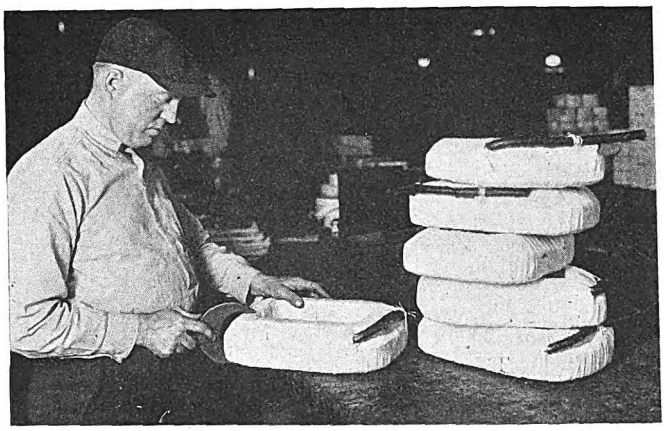


To make certain that coils do not run over size they should be gaged accurately

moving the old insulation around the terminals. If both terminals are at the same end it may only be necessary to remove the insulation from that part of the coil by stepping it back. When the end of the coil is retaped with new tape these steps permit a perfect seal when the coil is dipped and baked. If the terminals are on the opposite ends of the coil it is best to remove all of the old external insulation.

After the old terminal has been removed a piece of flexible cable should be connected to each end of the field coil. This is done on coils wound with bare copper strap by forming the coil end around the cable wherever possible, otherwise by fanning out the ends of the cable and wrapping it securely to the end of the coil with small copper wires or by making a lap joint with a sleeve connector. This joint should be soldered carefully, for a good joint will eliminate heating at this point. Two pieces of fishpaper and mica should be placed with the two mica surfaces together, between the coil and the joint, and the leads should be tied securely to the coil with strong cord. Empty spaces which may exist around the leads should be filled with oakum. After reinsulating, the coil should be dipped three times in a good grade of plastic varnish, baking it thoroughly each time. The coils should be gaged for thickness and size.

How to Test Field Coils

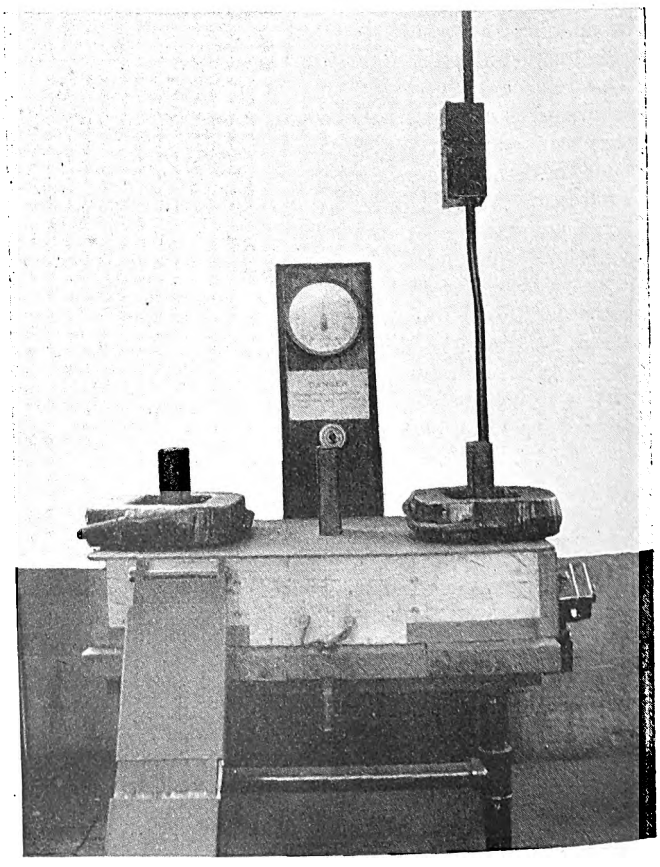
A device for locating faults in field coils before they are assembled in the motor frame is shown in an accompanying illustration. The apparatus consists of an E-shaped electromagnet, which has a detachable yoke. The exciting coil is wound around the middle leg of the E. On the back of the E between the middle leg and each outside leg are wound two small coils. These two coils are connected so that under average conditions the electromotive force induced in them is opposite, thereby accurately balancing each other. A zero center wattmeter or ammeter is connected to these coils to register any unbalancing.

To operate the set a good field coil is placed over one of the outer legs while the coil to be tested is placed over the other. If it has no shorts or current leaks between turns the needle will remain at zero. If the insulation in the coil has given way so that an induced leakage current will flow between turns, this alters the distribution of the flux so that more will pass through the detecting coil on that side of the E, thereby inducing a higher voltage in it and causing a current to flow, the value of which will be proportional to the flow of leakage current. If the coil being tested has one or more short-circuited turns the needle will leave the scale. To obtain consistent results it is necessary that the field coils have the same number of turns, and be made on the same mold. It is also necessary to place them on the set in as near the same position as possible, for a slight variation in position and coils having very heavy copper will cause an unbalancing of the flux, which will in turn cause the meter to show an unbalanced condition. A little practice in handling this type of testing set makes it easy to avoid such misleading readings on the meter.

To locate the short in the field coil by heating, it is necessary to place the coil over the middle leg of the E and complete the magnetic circuit with the detachable yoke. The exciting coil is connected to the line for a short time with the meter shunted.

A very simple testing set can be rigged up to obtain the same results by using the portable growler which is used for testing armatures. An ammeter is connected in series with the exciting coil of the growler. A good field coil similar to the one to be tested is placed in the V-part of the growler, the magnetic circuit being completed by placing a laminated core through the coil so it touches the V of the growler. When the primary circuit is closed the current reading on the ammeter will be the exciting current. It will be different for various types of coils. The coil to be tested should be placed in the same position and the ammeter observed. If the current is higher than that of the good coil, there is an internal short or a current leakage between turns.

A simple resistance test set can be made by placing a similar standard or new coil in series with the one to be tested, across a direct-current line, a suitable resistance being used to limit the current. A voltage reading should be taken across each of the coils. If the voltage drop across the coil being tested is more than 10 per cent lower than the good coil it has short-circuited turns.



Field coil testing outfit

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Painting cars and buses of Public Service Co-ordinated Transport at its Newark shops

Shop Methods Systematized for

Upkeep of 3,900 Vehicles

Same personnel at Newark shops of Public Service Co-ordinated Transport is responsible for overhaul and repair of 2,100 cars and 1,800 buses

By H. A. Benedict
Mechanical Engineer Public Service Co-ordinated Transport, Newark, N. J.

NEWARK shops of the Public Service Co-ordinated Transport form the center of activity for overhaul and repair of a total of 3,900 public transportation vehicles. Of this number 2,100 are street cars and 1,800 are buses. This is the largest bus fleet in the United States and one of the largest aggregations of street cars. Maintenance methods have been thoroughly systematized to take care of the large volume of work required of these shops.

1,234 Cars Overhauled Last Year

Cars in need of extensive body repairs or painting, and cars damaged in accidents are brought to the shops for rehabilitation. If the trucks and motors are in need of overhauling, the car is placed over a pit in the motor shop, the body is raised clear of the trucks by an electric hoist, and the trucks are run out from under the body and then dismantled and completely renovated. Motors are removed and overhauled, armatures, fields and bearings are inspected and put in first class condition before reassembling. All worn parts of trucks and brake rigging are repaired or replaced.

When wheel flanges were worn the former practice was to turn down the tread of the wheel in a lathe to an extent sufficient to allow the flange to be re-shaped. This method has now been discarded at the Newark shops. An electric arc-welder has replaced the lathe turning process. The flanges of both wheels are built up simultaneously as shown in an accompanying illustration.

Before cars are painted all necessary body repairs are made in the carpenter shop. Underframe, posts, body panels and moldings, floor platforms, ceiling and roof are carefully inspected for defects. Worn or damaged seats, destination signs, registers and sash are removed and are repaired by men who do only this class of work.

In the paint shop the washing-down, priming, surfacing, enameling, striping and lettering, and varnishing processes follow a rigid time schedule. As cars, after having been painted and trimmed, leave the paint shop, the lines of cars are moved down each day and more cars are

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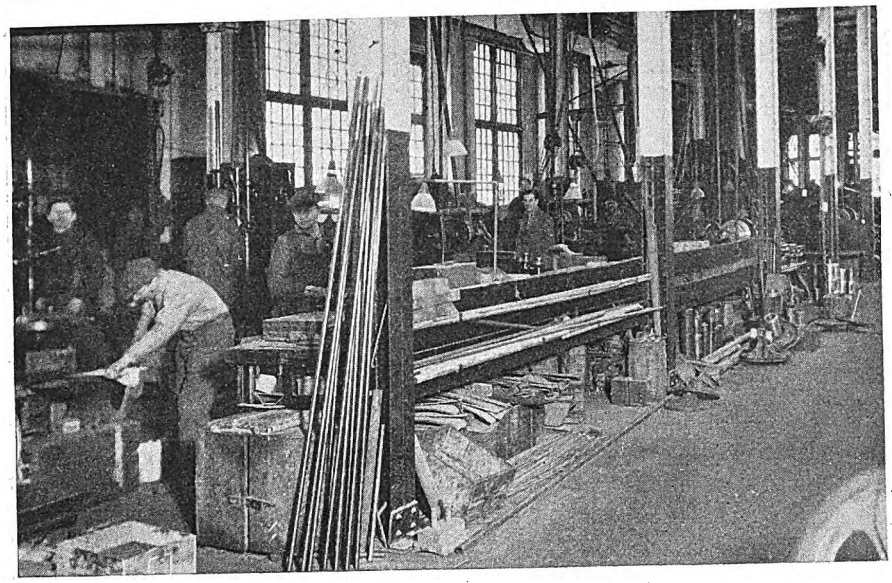


Machining bearings in the truck overhaul shop

brought in on the wash-stand at the other end of the shop.

During the time the car is in the shops all the air lines, air compressor and the various electrical equipment such as controllers, circuit breakers, heaters, buzzers and headlights, are inspected and tested and all necessary repairs made, so that after a final inspection the car is again in the best of condition and ready for service. During the year 1927, by means of this system, 1234 cars were thus rehabilitated.

Same Personnel Does Bus Overhauling

Another important activity of the shops is the re-conditioning of buses. At the present time the shops are completely equipped for the overhauling of all chassis units as well as for the manufacture and repair of fenders, hoods and radiators.

Nowhere else in the system is the principle of co-ordination of car and bus better exemplified than at the Newark shops. The same armature winders who during years of experience have become experts in rewinding and repairing car motor armatures now work on gas-electric bus generators and motors as well. Gas-electric controllers and resistances have no secrets for men who have spent years repairing similar equipment for cars. The same idea of co-ordination extends to the other departments like the carpenter and paint shops, where cars and buses stand side by side.

Parts Overhaul Is an Important Activity

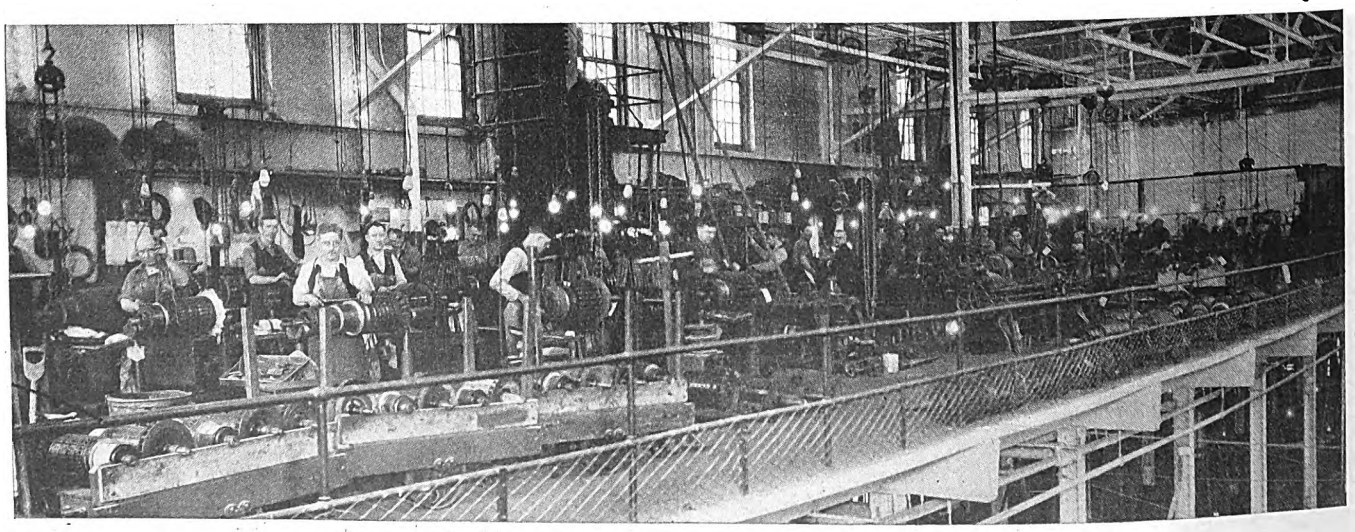
The overhauling and painting of bus bodies is carried out in much the same manner as that of cars. The bodies are completely overhauled and all necessary repairs made to fenders, hoods, radiators, wiring circuits, seats, sash and destination signs. The buses are then driven into the paint shop, and as in the procedure with the cars, the lines of buses are moved down each day until the finished buses, ready for the road, roll out the south doors. During 1927 there were 815 buses handled in this manner.

Still another function of these shops is that of the overhauling and general repairs to all units of the cars and buses. Among the many types of units re-conditioned at the shops for installation by the operating carhouses and garages are car wheels, armatures and fields, controllers, resistances, circuit breakers and other electrical units, compressors, axle and armature bearings, bus engines, transmissions, rear axle assemblies, gas-electric generators and motors, radiators, gasoline tanks, hoods and fenders. A complete ignition department overhauls ignition generators, starters, magnetos, carburetors and batteries. A completely equipped spring shop has just been established for the manufacture and repair of bus springs.

Hundreds of broken or worn parts are welded and machined each month in the blacksmith and machine shops. New castings are machined and put into stock for the use of the maintenance men in carhouses and bus garages. Every effort is made to utilize the most efficient methods known to modern shop practice.

In addition to unit overhaul, many other activities of the most varied nature are carried on at the shops. Signs of all descriptions are lettered in the sign department of the paint shop. New buses bought complete from bus manufacturers arrive with only a priming coat and are finished in the paint shop.

During the past year many street cars and buses have



Rewinding armatures for cars and gas-electric buses

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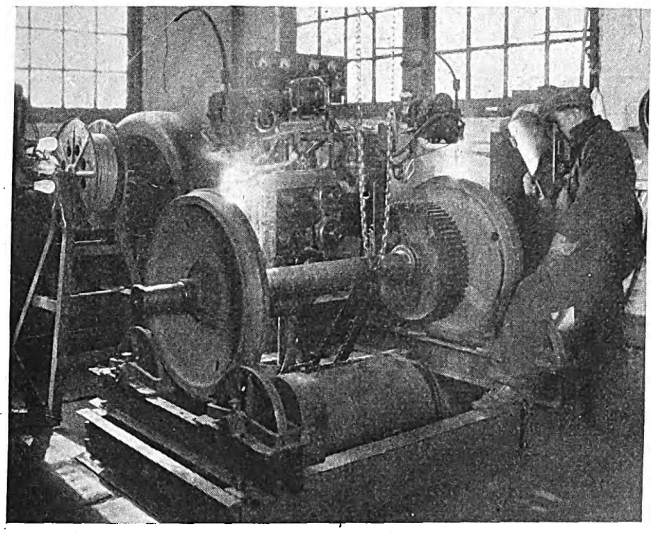

Building up wheel flanges by electric welding

been made "de luxe" by the installation of refinements, including more luxurious seats.

In 1924, after many years' experience in building cars, the shops turned their attention to the building of bus bodies. A design was adopted which has proved so satisfactory in operation, that with few modifications from year to year, 58 bodies were built in 1924, 189 in 1926, 65 in 1927, and at the present time a group of 331 are under construction.

Lays Rails for Double Track at Night

Without any delay to traffic Birmingham Electric Company completes 900 ft. of track reconstruction in eleven days

RECONSTRUCTION and repairs of track should be done with the least possible inconvenience to the public, in the opinion of the Birmingham Electric Company, Birmingham, Ala. Not only is it the opinion of the company, but it is an ideal that has been practiced by the company consistently. There is no need to expatiate upon the matter, but a recital of the facts about a recent typical instance will suffice to show how the company has gone about the task of putting into practice the doctrine which it preaches.

Recently the city decided to renew the paving on Twentieth Street from First to Fourth Avenue. At the same time the Birmingham Electric Company had to rebuild 900 ft. of double track. This track is in the heart of the city's business section, and more cars are run over it per hour than on any other line. Altogether, there are eight lines that use this track and during peak hours of travel, it carries an average of 51 cars per hour.

Work was begun Aug. 12 at 9 p.m. and finished Aug. 23 at 5:30 p.m. It included the complete rebuilding of the track and the return of the street to good condition. While the work was being done there were no delays to scheduled cars nor any accidents, although no cars were detoured while the track was being built.

Parking Prohibition Helps Work

The old track consisted of 9-in. 95-lb. girder rail, laid on creosoted ties in concrete, with bolted and bonded joints. The paving was of creosoted wooden blocks. The new construction consists of A.E.R.E.A. 7-in., 122-lb. girder rail, on the same ties with brick paving. It was necessary to use a 2-in. cast-iron tie plate on each tie to raise the 7-in. rail up to the grade of the former 9-in. rail. All joints were thermit welded.

In the work of reconstruction the wooden blocks adjoining the old rails were removed; then the concrete around the 9-in. rail down to the ties was cut out with air hammers. This space was then thoroughly cleaned for the new rail. The latter, before being put in place, was laid on the street parallel with the old track and thermit welded and ground in lengths corresponding to a city block. Between the hours of 1:30 and 4:30 a.m., when there was only one-hour service on the line, the new rail was slipped into place. This was done without in any way interfering with the schedules of the cars.

While the work was going on, the city authorities prohibited parking on both sides of the street. During this time, the earnings on the lines that operate over this section of track showed a slight increase over the previous week. This gain was attributed to the restricted parking in force.

At the conclusion of the work the company received a most complimentary letter from the city engineer extending congratulations on the expeditious manner in which the work was done.

This double track in Birmingham was relaid down to the ties in eleven days without any interruption of car movement

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ELECTRIC RAILWAY New

Help Your Company to Win New Maintenance Trophy to be Awarded at Next A.E.R.A. Convention

Individual Cash Prize of $200 Offered for Best Maintenance Idea of the Year

Twelve Cash Prizes to be Distributed Among Maintenance Men in Various Departments

IN ANSWER to an industry-wide expression of appreciation of the value of ELECTRIC RAILWAY JOURNAL'S maintenance contest conducted in 1927 and extended in 1928, a new series of prizes and a bigger and broader contest have been arranged through the co-operation of the American Electric Railway Association and the committee of judges, for the purpose of stimulating increased recognition of the work of the maintenance man, and raising the standards of maintenance in the local transportation industry.

At a meeting of the committee of judges reappointed by F. H. Miller, president of the American Electric Railway Engineering Association, held Oct. 12, several changes in the contest were made to increase its value to the industry. These include first, the establishment of a trophy to be awarded at the next convention to the company making the greatest contribution to the improvement of maintenance practice through participation in this contest; second, an annual cash prize of $200 to the individual submitting the best maintenance idea. This award also to be made at the annual convention. Third, a series of twelve individual prizes of $25 each to be divided equally between maintenance men in the following four divisions; (1) Rolling stock and shops, (2) way and structures, (3) electrical and line, (4) buses and garage, including shop equipment for bus maintenance. Fourth, departmental certificates of merit to be awarded to each of the four departments making the best individual showing in the contest.

AS IN the previous maintenance contest, the purpose is to arouse interest among maintenance men in the development and adoption of improved methods for performing routine work, or new methods or fixtures that save labor, time and money in maintenance on a transportation property. All entries are to be made in the form of short articles describing briefly methods or devices that improve maintenance practice. These will be judged primarily on the value of the idea presented and its adaptability to the maintenance work of transportation companies. Special writing ability is not necessary. It is the intention to make the prizes available to men engaged in practical maintenance work. The form of presentation will be judged only as to the clearness with which the method or device is described and illustrated, and the extent to which information is given which would be needed by other properties interested in using the idea.

THE opportunities for individual men to win cash prizes include both the capital prize of $200 and the twelve departmental prizes previously outlined. The departmental prizes will be divided into three groups, as follows: (1) Four prizes of $25 each to be

Rules of the Contest—

1 The contest will be judged and the prizes awarded by a committee of the American Electric Railway Engineering Association consisting of A. T. Clark, superintendent of rolling stock and shops United Railways & Electric Company of Baltimore, chairman; Howard H. George, superintendent of research Cleveland Railway; F. McVittie, electrical engineer New York State Railways, Rochester, N. Y.; G. C. Hecker, special engineer American Electric Railway Association; Charles Gordon, editor *Electric Railway Journal*. All decisions of the judges in interpreting the conditions of the contest and in making awards will be final.

2 Any employee or official of an operating electric railway or bus company may compete for the prizes.

3 Each contestant may submit any number of items he desires, each of which will be judged separately. An individual may win several of the prizes.

4 The author does not necessarily have to be the originator of the idea, but it must be adopted and be in use on the property with which he is connected. The idea submitted may have originated on another property or may have been furnished by a manufacturer. No device or method a description of which, to the knowledge of the contestant or the judges, has been previously published will be eligible for this competition.

5 The competition is not limited to those who originated or developed the idea or apparatus described. Any employee, with the approval of the department head concerned, may submit a maintenance practice or device used on his property. More than one article covering the same device or method will not be accepted, however.

6 Where the management of a railway has a practice of requiring approval of articles sent out for publication such approval must accompany the manuscript. If written approval does not accompany the manuscript it will be assumed that such approval is unnecessary.

7 An article may be submitted by several persons or by a department, and need not be written by the person in whose name it is submitted. The prize will be awarded to the individual or department whose name appears on the manuscript, and may be distributed among the winners on any basis they may desire. Should there be a tie for any prize the full amount will be awarded for each of the articles involved in the tie.

8 Articles may describe any maintenance practice or device used by any department of a railway such as the maintenance of rolling stock, buses, shop equipment or methods and equipment for overhead line repairs, power distribution and power generation devices, signal work, track and way maintenance, etc. Unless manuscript submitted is marked to indicate the department to which it is to be credited, the judges will

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JOURNAL *Announces* Maintenance Contest

READ the conditions of this new and bigger maintenance contest. Any employee or official of an electric railway or bus operating company may compete. No limit on number of items that can be submitted. Don't delay getting started. Winning company, department and individual to be honored at next convention. Contest starts Monday, Oct. 22, 1928, and ends midnight, Aug. 17, 1929.

READ CAREFULLY

determine the classification under the following divisions: (1) rolling stock and shops; (2) way and structures; (3) electrical and line; (4) buses and garage.

9 Articles submitted for these prizes should be preferably 100 to 200 words in length and should be accompanied by one illustration. Brevity consistent with a proper presentation of necessary information will be given weight in judging articles. In no event should they be longer than 400 words with not more than two illustrations. Articles will be published as promptly as space permits.

10 In rating the various articles the committee will consider the primary value of the method or device as of highest importance. The committee will also consider its practicability, the advantages and economies that are set forth and the clearness and completeness with which the idea is presented.

11 The original manuscript and illustrations will be turned over to the committee of judges for making all awards. These may, however, be published before or after prizes are awarded.

12 All articles must be in the English language and be mailed to the editor of *Electric Railway Journal*, Tenth Avenue and 36th Street, New York City.

Items to be eligible for the first group of departmental prizes must bear a postmark not later than midnight, Jan. 15, 1929; for the second group not later than April 15, 1929; for the third group not later than July 15, 1929. All material bearing a postmark not later than midnight, Aug. 17, 1929, will be eligible for individual cash capital prize, company trophy award and departmental certificates of merit.

13 The announcement of winners of departmental prizes will be made in the issue of *Electric Railway Journal* devoted to maintenance and construction (the third issue each month) in the month following the closing date for each group of departmental prizes. Winners of the company trophy, individual capital cash prize and special departmental certificates of merit will be announced, and awards made, at the 1929 annual convention of the American Electric Railway Engineering Association.

14 Any material submitted may be published at any time after its receipt that the editors of *Electric Railway Journal* decide.

15 All articles submitted will become the property of *Electric Railway Journal* and no manuscripts will be returned.

16 A minimum of $5 will be paid for each item published.

Additional copies of these rules and full details of the contest may be obtained upon application to ELECTRIC RAILWAY JOURNAL or the American Electric Railway Association.

awarded for the best maintenance idea submitted before Jan. 15, 1929, from each of the four departments mentioned, namely, rolling stock and shops, way and structures, electrical and line, buses and garage. (2) Four prizes of $25 each for the best items submitted between Jan. 15, 1929 and April 15, 1929, divided between the four departments as before. (3) Four prizes of $25 each for the best items submitted from April 15, 1929 to July 15, 1929. Announcement of the winners of these departmental prizes will be made in the regular maintenance issues of the JOURNAL following each closing date. The annual cash prize of $200 will be awarded at the convention for the best single item submitted in the contest.

AS PREVIOUSLY stated, the annual company maintenance trophy will be awarded at the convention to the company making the greatest contribution to the improvement of maintenance practice through participation in this contest. In determining the winning company, the judges will consider; the total number of items submitted by employees or officials of a given company; extent to which each of the four maintenance divisions are represented in the items submitted; number of individual departmental prizes won; relative merit of all material submitted; extent to which the ideas presented are applicable to other properties; value to the industry of the maintenance ideas made available through participation of employees or officials in this contest.

In addition to the individual prizes and the company award, a special certificate of merit will be presented to each department making the best individual showing upon the same general conditions as outlined for the company award. These certificates, together with the capital cash prize, and the company trophy will be presented at the convention.

GENERAL INSTRUCTIONS

Write on one side of the paper only. Have your article typed if possible, but manuscript written long hand will be accepted. Write the article as though you were writing a letter to another maintenance man giving him your experience with a new method or device. "Fine writing" is not necessary. Give merely the facts and a description of the device or method. Include data on cost savings effected whenever possible.

Envelope and manuscript should be marked "Maintenance Competition." Any number of items may be sent in the same envelope.

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Use of Carbon Brushes in Railway Service

By W. C. Kalb, *Chief Engineer*
National Carbon Company, Inc., Cleveland, Ohio

When carbon brushes were first used in electric railway motors the improvement in performance over the metal brushes was so marked that for a time it was felt that anything to which the name carbon could be applied was suitable for a brush. It was soon discovered, however, that certain compositions were decidedly superior to others, and a brush composed of a mixture of coke and graphite with a suitable proportion of pitch for the bonding agent became the standard railway brush. This brush was extruded in strips of the desired width and thickness, baked, sawed to required length, copper coated and considered a finished product. One sixty-fourth of an inch was considered a reasonable variation in thickness at that time, while limits of variation on width and length had not been suggested. This condition removed any necessity for grinding the brush to finished dimensions, since the shrinkage in baking could be controlled within those limits.

With progress in the development of electric traction, the demand came for a carbon brush of better quality than had yet been produced. Cars were being operated at speeds approximating those of the steam railways and the extruded carbon graphite brushes chipped badly at this high speed. Furthermore, commutator maintenance was unduly large and much of this was directly traceable to two things—failure of the brush to keep the mica flush with the commutator and the use of abrasive brushes in the effort to prevent high mica. Undercutting of the mica in the commutator made possible the use of a non-abrasive brush with much better wearing qualities than the type then in common use. Such a brush had been produced by the carbon manufacturers, it being a molded product, considerably harder than the extruded brushes then in use, and given its graphitic characteristics by graphitization in the electric furnace rather than by the incorporation of graphite in the original mix. This type of brush was not adapted for use on flush mica under the severe conditions encountered in railway service, since the process of graphitization removed all abrasive characteristics. Grades of this type could only be used successfully where the mica was undercut. The advantages were so evident, however, that the practice of undercutting electric railway commutators became general and the molded electro-graphitic brush the standard for railway service.

Small Clearance Found Advantageous

The advantages of small clearance between brushes and brush-holder boxes were realized at the same time. This resulted in much greater attention to the design and accurate construction of brush-holders than had formerly been considered necessary. It also led to the practice of grinding all faces of the brushes to close limits.

During the period of transition which accompanied the adoption of undercut commutators and greater emphasis on accuracy of brush and brush-holder dimensions it was decided that copper coating of railway brushes offered few advantages. When the brush wore down so that the copper coating came in contact with the commutator, beads of copper were formed which scored the commutator surface and often prevented removal of the brush from the holder. This led to the adoption of plain brushes as standard railway practice.

In the order of their relative importance, the requirements placed upon a brush for railway service are:

1. Maintenance of commutator surface in suitable condition at minimum cost.
2. Operation within normal limits of temperature.
3. Brush life.

While commutator maintenance per car-mile is small today in comparison with that experienced in the early history of electric traction, it is still an item of major importance that is influenced to a large extent by the characteristics of the carbon brushes. Commutation must be good, otherwise spotting soon develops on the commutator, necessitating resurfacing. Abrasiveness must be avoided, but the brush must be sufficiently hard to polish the commutator surface and sufficiently strong to withstand the mechanical stress encountered. Low friction is important in a railway brush, not only to maintain temperature within the desired limits, but also to prevent chattering with resultant breakage.

Side wear on certain types of motors becomes the limiting factor in brush life rather than reduction in length of brush. There seems to be conclusive evidence that side wear results from three distinct causes—vibration of the brush, abrasion from dirt drawn into the motor, and burning due to arcing between the brush and the sides of the brush-holder box. Side wear due to abrasion is most pronounced on ventilated types of motors where the air is drawn into the motor from the bottom of the frame directly onto the commutator and brushes. On some roads this condition has been corrected by closing the bottom ducts in the frame and using a perforated cover plate with a baffle plate immediately below it, preventing the incoming air from blowing directly onto the commutator. Where the side wear is traceable to arcing it may be overcome by the use of flexible shunts on the brushes. This adds appreciably to the cost of the brush, but may increase the life enough to more than offset the added cost.

Careful Workmanship Important

In the maintenance of commutator and brushes, considerable economy will be realized by placing emphasis on careful workmanship. The commutator surface should be finished in true cylindrical form and as smooth as possible, since the minute ridges left by turning or sand papering with coarse sand paper cause rapid brush wear. In undercutting it is important that no fins of mica be left in the sides of the slots. It is also desirable to chamfer the edge of the slots slightly in order to remove any burrs raised by the undercutting tool. Brush-holders should be kept to accurate dimensions, proper spacing and alignment, and free from any burrs which might interfere with the movement of the brush. Uniform tension should be maintained on all the brushes of a motor, the amount of pressure ranging from 3 to 8 lb. per square inch depending on the condition of roadbed and speed of operation.

While the present trend on railway motor design is toward the use of small-diameter motors of high angular velocity with compound gearing or worm reduction, necessitating emphasis being given to low coefficient of friction in selecting the most suitable grade of brush, the development does not indicate the need in the immediate future for a radical change from the type of brush now standard for electric railway service.

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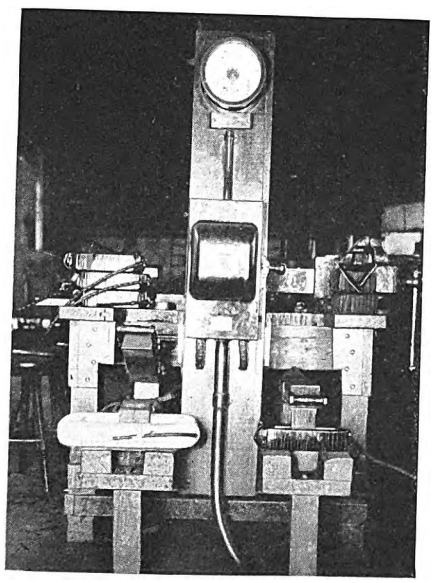
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—56

Pittsburgh Railways' Method of Testing Field Coils

MANY ways exist for testing field coils for short-circuited turns. The method used by the Pittsburgh Railways is simple and a large number of coils can be tested in a short time.

The test outfit consists of two separate cores, one for the main field coils and the other for commutating field coils. Each core has a separate primary coil wound for 110 volts alternating current. An ammeter is placed in the main circuit to read the current used in either coil. Only one exciting coil is used at a time and is connected in circuit by a double-throw safety switch. The width and thickness of the leg of the core over which the coil is slipped during testing is of a size that will take the smallest coil in that class. The distance between the two legs is such that it will also take the largest coil which must be tested.



Field coil in position for testing with the special outfit

These cores are mounted on a table so that the long side is horizontal. The top section of each core is hinged at one end and has a handle at the other. A counterweight connected by a rope through a pulley balances this part of the core so it can be raised or lowered with little effort.

The correct value of the current for the primary when the field coil is not short circuited can be determined by placing a field coil which is known to be good in its proper position and noting the reading of the ammeter.

(OVER)

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—57

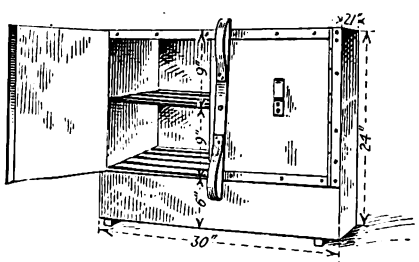
Armature Coil Oven

By R. S. Beers
Railway Engineering Department, General Electric Company, Schenectady, N. Y.

WITH the present practice of having armature coils fit just as tightly in the slot as possible, it is desirable that the coils be soft, pliable and flexible at the time they are installed in the armature. One way of assisting this is to warm the coils before they are installed. This softens them, making them more pliable, and reduces the chances of damage to the insulation when they are being put in the slots.

An oven for this purpose can be of very simple construction and requires only a low heat. Any railway can make one in its tin shop and will find, when this oven is used, that the armature winder is able to do a better job with much less trouble.

Such an oven is shown in the accompanying illustration, with approximate dimensions. This particular oven has space for one set of armature coils. It is made of No. 16 gage sheet steel (0.0625 in.) and lined with sheet asbestos, the same as is used to insulate drum controller covers. Current for heating is taken from the trolley, and five 100-watt lamps are used for the heating elements. A temperature of about 150 deg. F. is correct. This temperature so softens the coils that they are pliable, and does not make them so hot that they are likely to burn the armature winder's hands.



Armature coil softening oven in shop of the Schenectady Railway

The coils should be put in the oven 30 to 45 minutes before they are used, in order that they will have time to become heated all the way through. A good practice is to put ten to twelve coils in the oven, and, when they are heated, to take out one or two hot ones and replace them with cold ones.

The oven illustrated was built by the Schenectady Railway for its armature room. Other operators have built similar ovens, and in every instance the armature winders have found that the armature coils went in the slots better and could be settled into their proper locations with less hammering and rough treatment of the coil.

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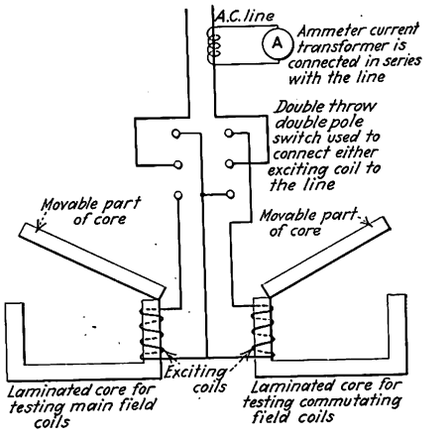
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—ELECTRICAL—56

Pittsburgh Railways' Method of Testing Field Coils—Continued

This value will vary for different sizes of coils.

The field coil to be tested is placed over the vertical leg of the core and the magnetic circuit is closed by lowering the top section. If the field coil has one or more short-circuited turns the ammeter will show a current reading in proportion to their number. By leaving the short-circuited coils on the set for a few minutes the shorted part of the coil will begin to heat. In this manner it is possible to determine the location of the short. If the field coil has no short-circuited turns the ammeter will register only the exciting current.



Connections for field coil testing outfit

It is possible to use this outfit for testing open circuits merely by short circuiting the field coil leads. Immediately the ammeter should show a heavy current reading when the primary switch is closed. If the coil has an open circuit, the ammeter will only register the exciting current.

While the field coils are being clamped into the motor frame some of the coils may become short circuited. The Pittsburgh Railways gives every overhauled motor a load test before it is placed in the car truck. This load test will show up any faulty field coil which may have tested out O.K. before it was installed.

Electric Railway Journal Maintenance Data Sheet

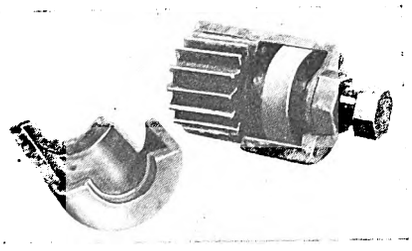
ROLLING STOCK—ELECTRICAL—58

Screw Type Pinion Puller*

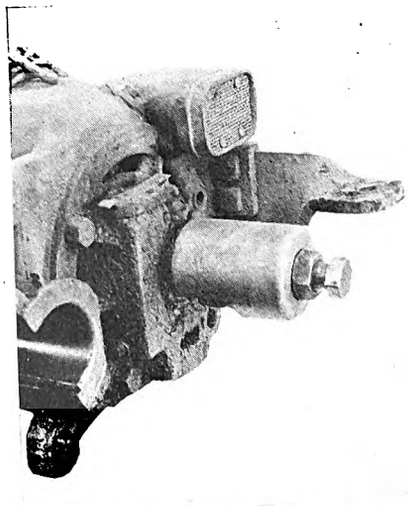
BY C. B. HALL
Chief Clerk Mechanical Department
Virginia Electric & Power Company,
Norfolk, Va.

FINDING that the old practice of using sledge hammers and wedges to remove pinions was damaging gearing, bearings and housings, Grafton Day, foreman of the machine shop Virginia Electric & Power Company, Norfolk, Va., devised a screw-type pinion puller.

The device includes a split steel casting with a concave hook to fit down over the back of the pinion when the puller is in position and a screw arranged so that it strikes directly against the end of the armature shaft. In operation the hooked end is placed back of the pinion and usually a single turn of a wrench on the hexagonal head of the screw will start the pinion so that it can be pulled off easily. One part of the housing is cut away so that the puller can remove pinions while they are still engaging the gears.



Pinion removed from motor and puller opened up to show construction



Pinion puller in position on G.E. type 203 motor

**Submitted in* ELECTRIC RAILWAY JOURNAL *Prize Contest.*

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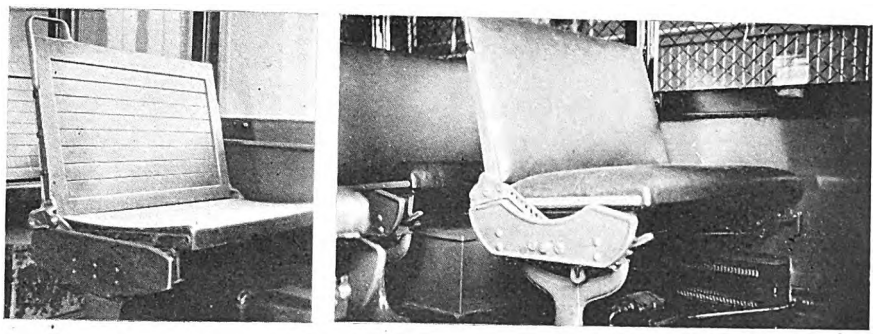
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—40

Slat Seats Replaced by Upholstered Type*

By J. E. Bodah
Master Mechanic Wisconsin Public Service Corporation, Green Bay, Wis.

"RIDE on leather" has become a potent slogan of those who travel on the common carriers in the districts served by the Wisconsin Public Service Corporation. This railway had a number of Birney cars with wood slat seats. Believing that the public was interested in a vehicle with a more comfortable type of seat, these were reconstructed. It was quite desirable to keep the expense low, and as a moderate priced leather upholstered seat costs about $36 each or a total of $504 for the fourteen seats in this size of city car, it was decided to utilize the existing slat seats in the reconstruction. A good grade of brown upholstering leather and long hair packing was obtained and a comfortable seat was turned out by the shop forces at a cost of but $10. In comfort, appearance and durability the reconstructed seat is equal to most of those on the market.



At left—One of the wood slat seats as originally installed. At right—Newly upholstered seat now used

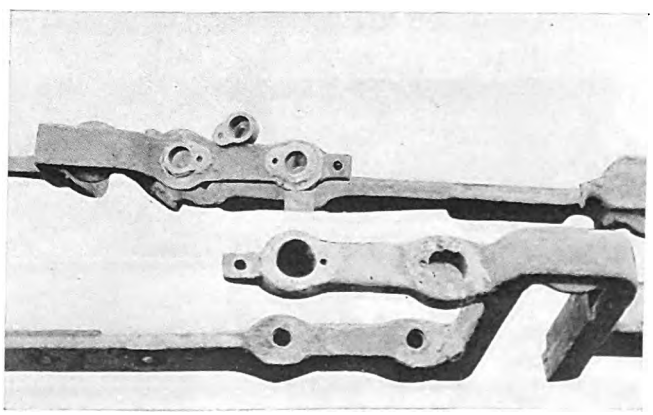
Submitted in Electric Railway Journal Prize Contest.

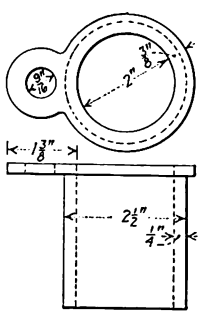
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—30

Welded Side Post Bushings

MANGANESE steel bushings are being used in Brill 22-E truck side post spring castings by the Jamaica Central Railways, Jamaica, N. Y. Originally these bushings were bolted to the casting but considerable trouble developed, as the bolts worked loose and left the bushing free to move. The bushings are now welded to the casting to overcome this trouble. A low welding heat is used to prevent crystallization of the casting. When the bushing is worn out, the weld is chipped off and a new one inserted.





The bushing itself is seen at the top, and two of them are in position. The welding has been completed on one end only. Below is shown a casting prepared for the reception of new bushings. The line drawing shows the manganese steel bushing for truck frame

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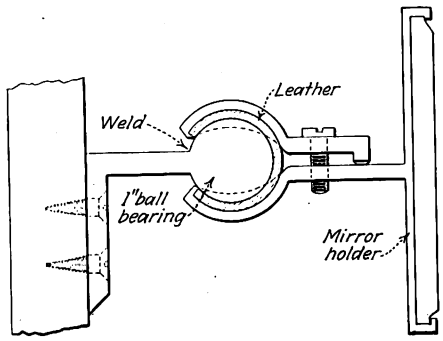
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—41

Preventing Theft of Rear Vision Mirrors*

By Farrell Tipton
Electrician San Diego Electric Railway, San Diego, Cal.

ONE of the many parts of automobile equipment that has been adapted to street car use is the rear vision mirror. The San Diego Electric Railway first installed automobile mirrors as manufactured, but experienced difficulty due to the large numbers that were stolen. To stop the loss the bracket shown in the accompanying illustration was devised. Since this type of bracket has been used no thefts have been reported.



Special clamp for adjustable rear vision mirror

The bracket is made of $\frac{1}{4}$x1$\frac{1}{4}$-in. mild steel. The sockets are formed by a die under the steam hammer. A 1-in. ball for bearing is welded to the body angle bracket, and a thin piece of leather placed between the ball and the socket provides a satisfactory clamp for holding in place.

*Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

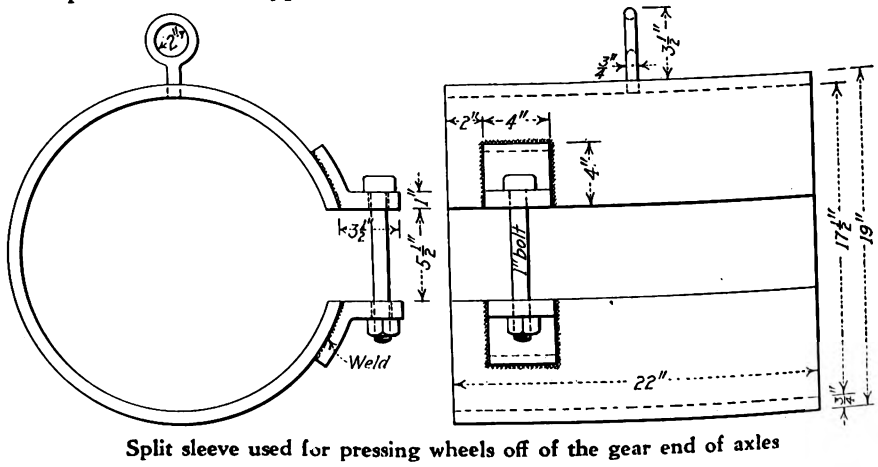
ROLLING STOCK—TRUCKS—81

Split Sleeve for Pressing Off Wheels at Gear End of Axle*

By Charles Herms
General Foreman San Diego Electric Railway, San Diego, Cal.

CAR wheels of the San Diego cars, of 26-in. diameter, are pressed off from the gear end of the axle with the aid of the split sleeve shown in the accompanying sketch. It was found impracticable to press the wheels off with tool steel pins passed through the four holes in the web of the gear, as the holes were not large enough to permit use of a pin of sufficient size to withstand the pressure required.

The inside diameter of the split sleeve used is such that it will go over the outside of the gear and the opening of the split is wide enough to slip over the axle. After the sleeve is in position a 1-in. bolt is passed through the holes in two brackets and is tightened to keep the sleeve from swinging open while under pressure. The bracket end of the sleeve is placed next to the wheel as the dish of the wheel tends to act as a wedge and forces the sleeve open while under pressure. This type of sleeve has been found superior to other methods of pressing wheels off as it is self-aligning and distributes the pressure evenly around the rim of the wheel.



Split sleeve used for pressing wheels off of the gear end of axles

*Submitted in Electric Railway Journal Prize Contest.

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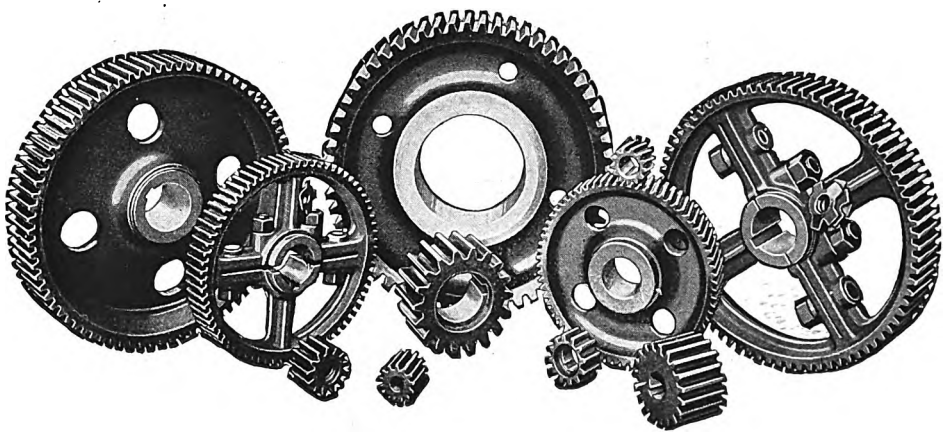
"Tool Steel" speaks gear economy in any language



「ツール、スチール」

ツール、スチール製品は科學的に充分熱化せるものにて(圖解參照)文字通りツールスチールを帶びたるものなり。

ツール、スチール製品は凡て特別熱化法を施したるものにて、あらゆる用途に於て普通品の五倍の使用に耐ゆることを實際的に保証す。

小ツール、ステール、ギーア。ピニオン(小齒車)又はスプロッケット等を見本的に注文して先づ弊品を嚴密に試驗されたし。

而して滿足なる耐久的用途に注意されよ記憶されよ——ツール、スチールは普通品の五倍の耐久力を保証されたものであることを。

三井物產會社が弊社代理店であります。

北米華州シアトル市

シー、エム、ラヴステッド商會

OUR advertisements and salesmen must speak many languages for "Tool Steel" Gears and Pinions are in daily use in all corners of the globe.

The advertisement above, was taken from a dealers booklet with Japanese circulation. However from the standpoint of economy "Tool Steel" Gears and Pinions speak a universal language.

The Tool Steel Gear & Pinion Co.

Cincinnati, Ohio

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ANOTHER PROOF OF PERFECT LUBRICATION

TULC A LUBRICANT

TULC was used to lubricate the new 1000 H. P. Locomotive which made a fast run from Decatur, Ill. to Cleveland, Ohio.

TULC produced unsurpassed lubricating results on this run.

TULC is the standard lubricant on many traction systems.

THE UNIVERSAL LUBRICATING CO.

1400 Schofield Bldg., Cleveland, Ohio

Complete satisfaction

Operating perfectly and requiring minimum attention for maintenance and lubrication, Earll Catchers and Retrievers give genuinely satisfactory results. Their refinement of design, and mechanical superiority are summarized in the following five features, peculiar to Earll construction.

No-wear Check Pawl
Free-Winding Tension Spring
Ratchet Wind
Emergency Release
Perfect Automatic Lubrication

Earll Catchers and Retrievers

C. I. EARLL, York, Pa.

Canadian Agents:
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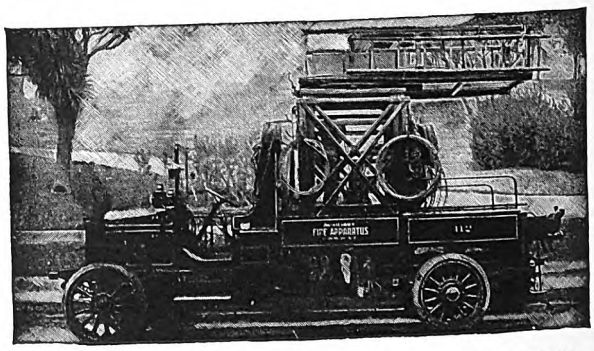

TRUCK WITH TOWER IN RUNNING POSITION

TRENTON TOWER

This 3-Section

is not only more convenient, but stronger than the older type.

The top section is reinforced by the intermediate section. The 3-section design makes it possible to raise the platform 16 inches higher and drop it 12 inches lower than can be done with the old-style 2-section tower.

We'll gladly send you details.

J. R. McCARDELL CO.
Trenton, New Jersey, U. S. A.

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—42

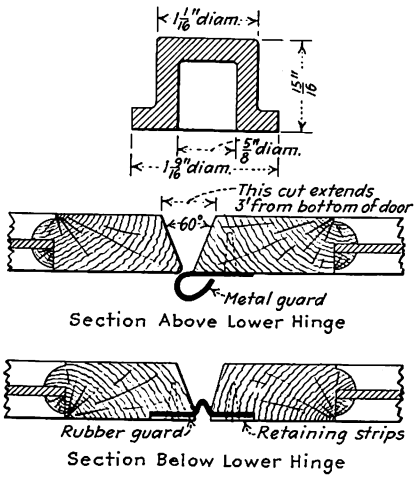
Preventing Accidents from Folding Doors*

By A. M. Lindsay
Superintendent of Rolling Stock Montreal Tramways, Montreal, Canada

WHERE cars are equipped with air-operated doors which fold to the outside there is a tendency on the part of passengers to use the outside edge of the door as a grab handle when boarding or alighting from the car. When used thus, there is danger of passengers having their fingers pinched in the hinges or cracks of the door. To eliminate this danger, all new folding doors on the Montreal Tramways system are now constructed with guards, as shown in the accompanying illustrations.

In this construction the outside edges of the hinge side of the doors are beveled at a 45-deg. angle, as high up as the center hinge. It has not been considered necessary to carry the bevel higher than this, although it can be if desired. The usual opening between the leaves of the door when open is closed by a dummy hinge which is installed between the center and bottom door hinges. This dummy hinge consists of a $\frac{1}{16}$-in. plate curved to a $\frac{5}{8}$-in. diameter on one side and screwed to one leaf of the door. The space below the bottom hinge where the door folds against the step riser when closed, is protected by a piece of reinforced sheet rubber attached as shown in the sketch. This type of construction is neat, inexpensive and effective.

Another improvement which has



At top, section of improved door bumper

Below, section showing method of installing guards on folding doors

*Submitted in Electric Railway Journal Prize Contest.

(OVER)

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—36

Driver for Steel Fence Posts*

By D. H. Walker
Chief Engineer Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.

FOR several years the Terre Haute, Indianapolis & Eastern Traction Company has standardized on steel fence posts 7 ft. long, used with 47-in. woven wire fencing. The company has approximately 100,000 rods of fencing to maintain. Formerly two men were used for setting fence posts. They used a sledge to drive the posts, and a wooden horse or other device to stand on during the driving operation.

To provide a better method of driving posts, a simple driver was made in the blacksmith shop of the company. Use of this device now enables one man to drive these fence posts much faster than two men could drive them previously.

The driver consists of a 4-ft. length of 2-in. pipe with 6 in. of round steel rod welded inside at the top end. The cost of making a driver is $1.25, of which $1 is for material. An accompanying illustration shows how the driver is slipped over the post and how the pounding operation is carried out by one man standing on the ground. This type of driver also keeps the post straight during the driving operation and provides more accurate alignments.

Setting a steel fence post by means of special driver

*Submitted in Electric Railway Journal Prize Contest.

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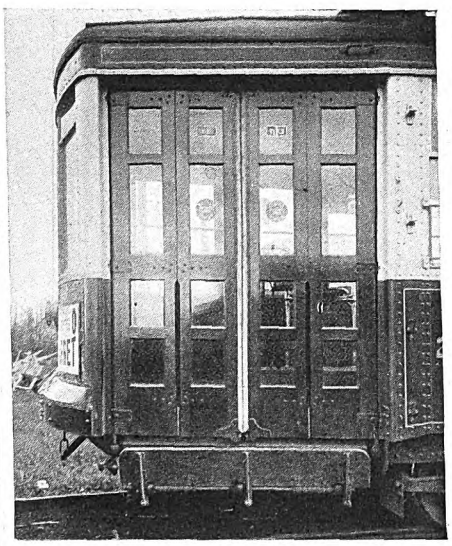
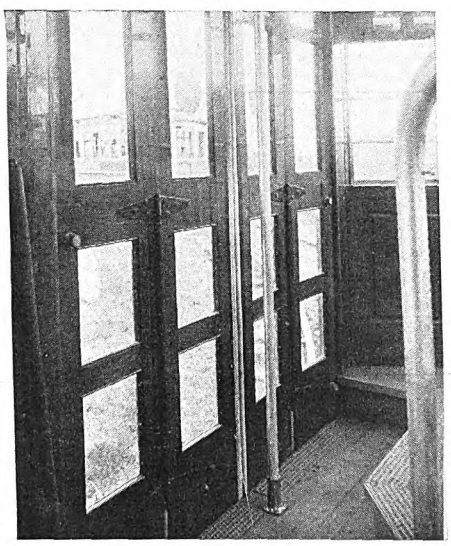
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—42

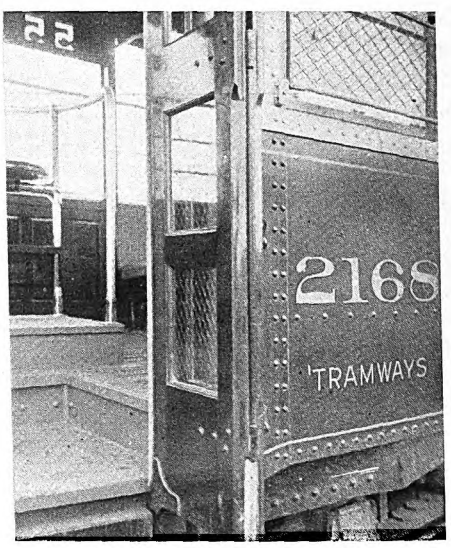
Preventing Accidents From Folding Doors—Continued

been added to the cars having folding doors consists of a new type rubber bumper. The original type of bumper consisted of solid rubber and was used to keep the leaves of the folding doors from striking as the door opened. The type of bumper now used is a molded hollow rubber bumper, as shown in the accompanying sketch. This has much greater cushioning effect than the solid rubber.





Appearance of car doors when they are in the closed position with guards installed



Appearance of car doors when open with guards in place

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—36

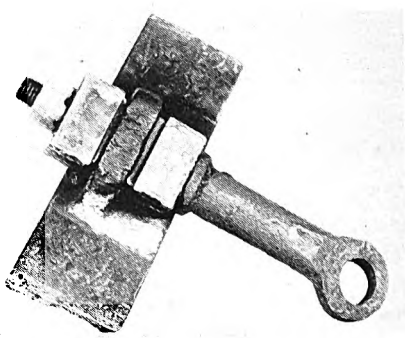
Shock Absorbers for Electric Track Switch Connecting Rod*

By F. W. Drowley
Roadmaster Toronto Transportation Commission, Toronto, Canada

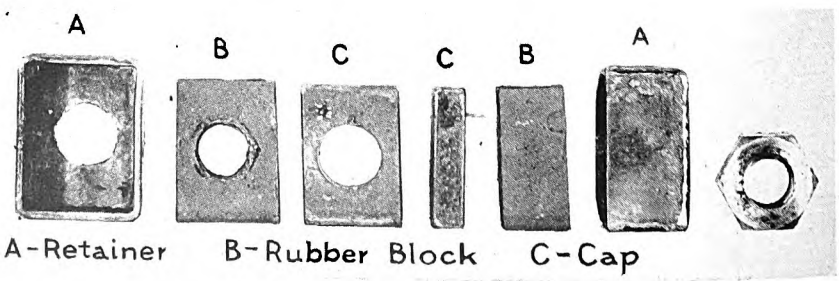
DUE to the uncushioned impact when tongues on electric track switches strike the casting at each movement, numerous breakages of the connecting rods have occurred on the lines of the Toronto Transportation Commission. As each broken connector involves a potential traffic delay a determined effort has been made to eliminate the trouble.

Several designs employing coiled springs were tried and proved unsatisfactory. An arrangement consisting of two heavy rubber blocks in steel retainers inserted on either side of the lug was tried and adopted. This latter device absorbs the shock and lessens the tendency towards crystallization of the metal in the connector. Injury from the bending to which the connection is subjected is lessened, due to the flexible nature of the connection. Further, as the insert is cut from solid truck tire rubber, the device is practically indestructible.

In placing the absorbers the connector nut is tightened up so that the $\frac{3}{8}$-in. cap is pulled about halfway into the retainer, compressing the rubber block about $\frac{3}{16}$ in. The whole is locked by a slot cut in the face of the nut engaging a ridge on the retainer.



Switch box connecting rod with rubber shock absorbers



Parts used in rubber shock absorber installation

*Submitted in Electric Railway Journal Prize Contest.

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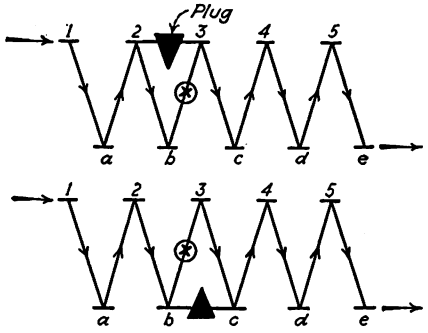
Helps for the Armature Winder

Avoid Plugging to Shunt Open Circuits

WHEN a four-pole, series-connected armature develops an open circuit, as indicated by flashing and by the burned appearance of the bars that include the open, the practice sometimes is followed of bridging the open by peening together the ends of the bars that are burned. This practice may do much permanent harm and should be avoided.

In each of the accompanying diagrams representing one of the paths



Figs. 1 and 2—Single plugging to eliminate the effect of an open circuit cuts out two armature coils

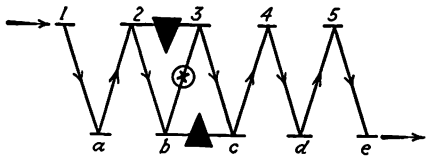


Fig. 3—Double plugging cuts out the open-circuited coil only and divides the normal current between the two adjacent coils

through a four-pole, series-connected armature, an open circuit is indicated at *X*. Each diagram shows a method of plugging to eliminate the effect of the open circuit. Fig. 1 shows bars 2 and 3 peened together and Fig. 2 shows bars *b* and *c* joined. In each figure, it will be noted that not only the open circuit coil is cut out, but also one of the coils adjacent to it.

The false conclusion is sometimes drawn that plugging the commutator on both sides, as shown in Fig. 3, would cut out three coils, the open circuited coil and one coil on each side of it. However, study of the diagram shows that double plugging actually cuts out one coil less than is cut out by single plugging. The two plugs form two paths around the open-circuited coil and each carries one-half of the regular current. For this reason the practice of double plugging, as well as that of single plugging, should be avoided.

Effect of Wrongly Counting Lead-Spread

GREAT care must be taken in counting the lead-spread of a four-pole, series-connected armature, the number of coils of which is a prime number. Placing the lead in the wrong bar may cause the two electrical paths to be very unequally divided and cause almost a direct short circuit between the brushes.

Fig. 1 shows a 17-bar, 17-coil armature, properly connected, with the number 17 bar divided only by itself and by number 1. The correct lead spread of any coil, the coil connected to bar 1 and 9, for example, is 1 to 9.

In Fig. 2, showing an armature wrongly connected, the first bottom lead has been placed in bar 8 instead of bar 9. Each bar has two leads in it, but in no case is a bar connected with the two bars directly opposite. Furthermore, to go from any bar to the adjacent bar on either side of it, it is necessary to traverse five coils in series instead of two coils, as in a properly connected armature. In a bar to bar test of an armature connected in the wrong manner, the meter would give a deflection 2½ times that of an armature correctly connected; because, for a given current, the drop in five coils would be 2½ times that for two coils.

In both diagrams the brushes are shown in their proper relative positions. Starting from bar 17 and tracing both paths between the brushes of Fig. 1, one path includes bars 17, 8, 16, 7, 15, 6, 14, 5, 13 and 4, and the other path, bars 17, 9, 1, 10, 2, 11, 3, 12 and 4. The two paths include approximately the same number of bars and coils.

Tracing the paths of Fig. 2 in a similar manner, one path includes bars 17, 7, 14 and 4, while the other path includes bars 17, 10, 3, 13, 6, 16, 9, 2, 12, 5, 15, 8, 1, 11 and 4. The first of the paths includes only three coils and constitutes almost a direct short circuit between the brushes. An over count would give the same result.

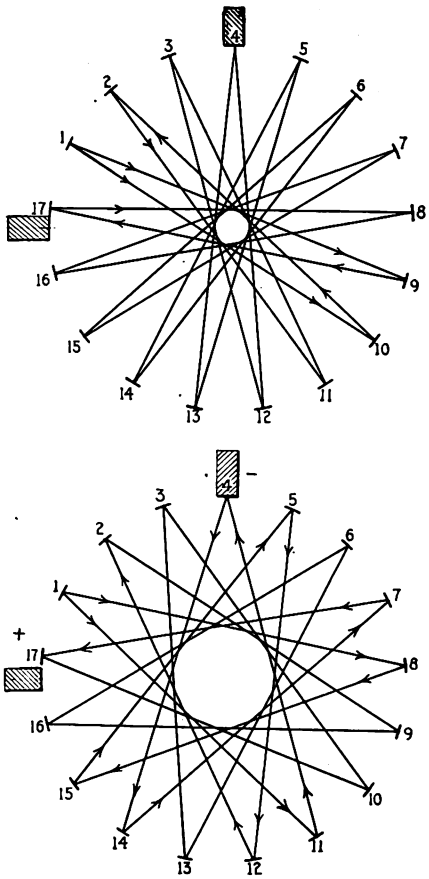


Fig. 1—Above, a properly connected 17-bar, 17-coil armature

Fig. 2—Below, armature with coils wrongly connected. One of the two paths includes only three coils, almost a direct short circuit

In Banding, Take the Following Precautions:

1. Use a band wire that is strong enough to prevent movement due to high speed and vibration.
2. Secure the ends of all band wires under the clips.
3. See that the bands are below the surface of the core to keep them from rubbing on the poles.
4. In applying core bands, see that the tops of the coils are $\frac{1}{32}$ in. above the band groove, so that the bands pull the coils down even with the core. If coils are too high and the bands do not rest on the core, loose bands will result when the insulation dries out.
5. Wind all core bands in one operation.
6. Use a 4 lb. clean iron, well tinned.

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PRACTICAL SHOP KINKS *from the* Coffin Prize

SEVERAL ARTICLES in recent issues of the JOURNAL *have given particulars of the operating practice of the Virginia Electric & Power Company, the winner of the 1928 Coffin prize. In this department this week are given some of the interesting maintenance methods and practices of the company, as told in its brief.*

High Art in the Machine Shop

THE machine shop of the Virginia Electric & Power Company is unique in more ways than one. Lightness and neatness are fundamental principles applied to these shops because these qualities are usual allies with efficiency, but the renovating policy of the company did not stop with lightness and neatness.

In September, 1927, taking a tip from the modern kitchenette, the company decided that tradition was the only reason why a machine shop should be dull and forbidding in color. The organization had seen such satisfactory results follow cheerful coloring on cars that there appeared to be no good reason why the lathe and the boring mill should not be glorified in the same way.

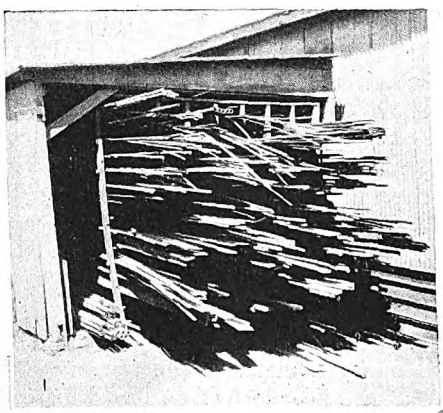
In contrast to an all-black machine, the new color plan calls for liberal use of reds and blues, with touches of yellow and black and backgrounds of green. The shop walls have been similarly treated, as were also foremen's booths, cabs and the transfer tables themselves.

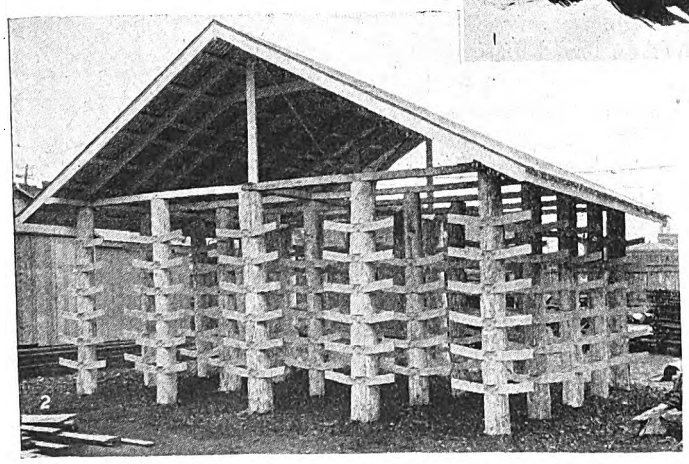
Since the painting up of the equipment in this way the machinists have shown an entirely new solicitude for their tools. They take pride in keeping their machinery attractive. Undoubtedly, also, the color contrast stimulates the brain and gives a sense of exhilaration, on the same principle that a dingy place brings forth dingy work.

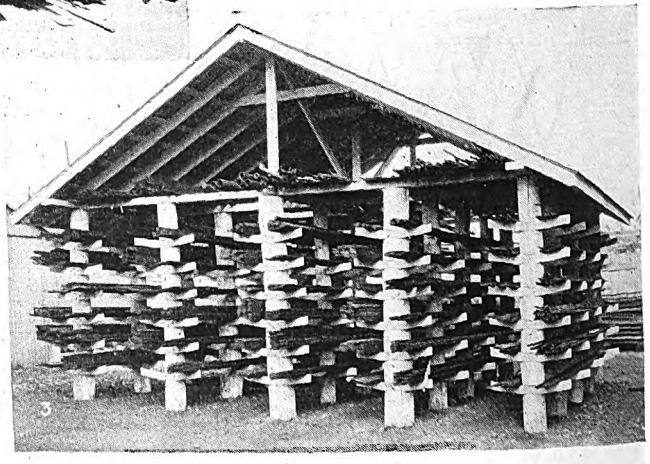
Pictures to show this kaleidoscopic effect would be useless. Instead, illustrations will be used to show some of the good housekeeping features, which characterize the shops of the company.

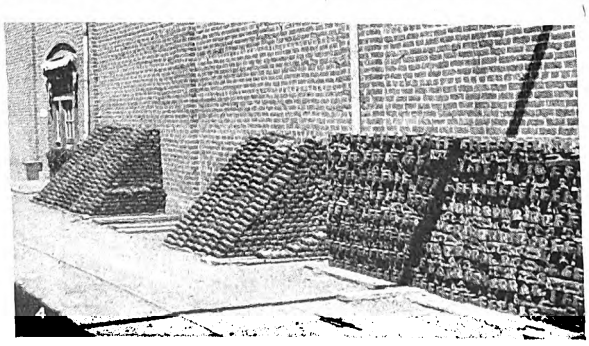
In former years, car parts after being repaired were often laid away in some corner with no attempt at methodical storage. Now they are taken promptly to the reclamation storage room where they can be obtained on requisition. Only parts under repair are permitted on the bench or floor of the shop.

The accompanying illustrations show the old and new ways of storing lengthy supply railway material. The old way was unsightly and laborious. It took a lot of pulling and shifting to get an article wanted. Now two men can select and remove the piece in seconds rather than in minutes. This is made possible by the change from rectangular divisions to yoke brackets. The rack









Old and New Methods of Storage

The method of storing as shown in No. 1 meant only "tug and pull." Now storage bins as shown in Nos. 2 and 3 have been built of discarded poles. No. 4 illustrates the method of stacking brakeshoes.

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Winner

was made by cutting old power-light poles into 12-ft. lengths, and cutting or gaining them to take U-yokes of ½x3½x36 in. size. Another picture shows how brakeshoes are stacked outside so that they can be obtained quickly and with no waste of time.

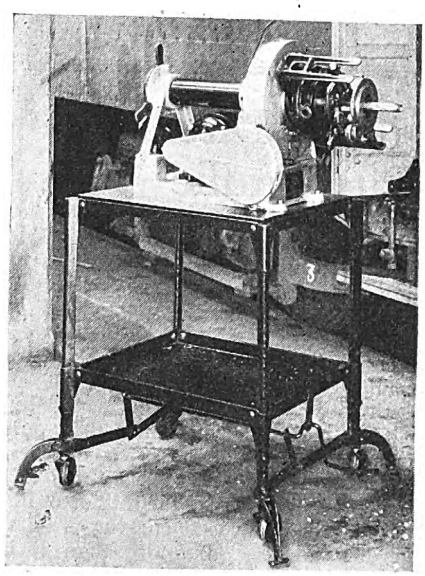
In this same campaign of neatness, special attention was given to the washroom. Modern fittings were used, an interior finish in white enamel was adopted and the room provided with good natural and artificial lighting and ventilation. All individual lockers were assembled in or near this room instead of being scattered around the shop, as they were formerly.

Saves Time in Metal Cutting

PORTABLE metal cutting is made possible on the property of the Virginia Electric & Power Company with the motor-driven "Unishear" shown in the accompanying illustration. It cuts No. 16 gage metal with the same ease and speed that the shopman's wife can sew a piece of cloth on a sewing machine. Since the machine can be carried around and operated from any lamp socket, it has proved a great saver of time.

Portable shear used in Richmond

Threading Pipes by Power



This power boy does better and faster threading and costs only 3 cents an hour for power

A CONVENIENT tool used in the shops of the Virginia Electric & Power Company is one used for threading pipe and similar work. It is shown above. It will take any type of hand stock and dies and eliminates the necessity of discarding such stock and dies.

It threads all sizes of pipe from ½ in. to 2 in., and with a special driveshaft it will operate any geared or reseating die stock up to 4-in. capacity. It will also drive any roller or square-end pipe cutter and can be used for turning up fittings. It is so convenient that it has been named in the shop the "Power Boy."

This machine eliminates two-thirds of the labor cost for threading pipe. Furthermore, the more uniform thread obtained over hand tools is reflected in fewer air failures from leaky pipe connections and in lower upkeep of compressors through conservation of air.

The power boy is run by a ½-hp. Universal reversible motor from any 115-volt a.c. or d.c. circuit and is mounted on a portable stand.

Increase in Armature Life in Richmond

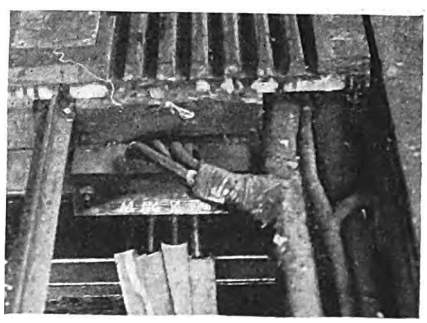
A FEW simple methods, adopted by the Virginia Electric & Power Company of Richmond, have gone a long way toward increased life for railway armatures. The first step was the introduction of dipping and baking equipment, in this case home made. An oven was built of scrap material and equipped with enough old car heaters to give a temperature of 325 deg. F. After the dippings, the armatures are baked for about sixteen hours at 226 deg. in a "sandwich" of 1-in. asbestos.

Another improvement has practically eliminated loose armature band wires. The old process was that of using insulating paper under the band wires. It is now the practice to use thin tin sheets which are held with cleats and sweated to the bands. Loose band wire disappeared with this change. In general, these and some other improvements introduced during the last two years have reduced the number of rewound armatures to one-half its former proportion. Reduction in pull-ins bear this out.

Although the GE-87 motor is a twenty-year veteran, improvements in lubrication have increased its bearing life from 10,000 miles to 75,000 miles and have cut axle-bearing troubles from 1,000 down to 200 per annum. Bearing life was lengthened by changing from lead to solid brass linings. Oiling was improved by closing the bottom axle cap, the old waste well being ineffective because the waste dropped away from the axle in a few days. Lubrication is now from the top.

Support for Motor Leads

CONSIDERABLE trouble was experienced at one time on the properties of the Virginia Electric & Power Company from broken motor



This car cable support has stopped the breaking of motor leads

leads. The cause seemed to be that through swaying, or perhaps chafing of the leads on some part of the equipment, the leads were brought into a condition where they broke easily.

At present, supports are being used for the leads so that they are brought much closer to the bolster center line than formerly. The accompanying illustration tells the story.

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Association Activities

Philadelphia Engineers Discuss Movement of City Traffic

THE VALUE of the three E's, Engineering, Education and Enforcement, in the expedition and control of city traffic, was emphasized in a series of papers presented before the Engineers Club of Philadelphia on Tuesday, Oct. 16. The papers included discussions on efficient street use, city traffic engineering, requirements essential to adequate street transportation, the function of street railway and bus lines, parking, pedestrian education and safety, and traffic signaling and signal apparatus.

Far more drastic parking restrictions in metropolitan areas, the installation of parking areas outside of the business district in connection with trolley, motor bus, or, if possible, high-speed lines, and the development of faster means of mass transportation facilities were seen as necessary steps in the solution of the present traffic problem. The proper place for the motor bus as a supplement to street railways and the value of co-ordinated transportation under a single management were recognized.

The afternoon session of the club was presided over by Arthur H. Blanchard, who introduced as the first speaker Dr. Miller McClintock of Harvard University. Speaking on "Difficulties in the Way of Efficient Street Use," Dr. McClintock stated that the great underlying difficulty is a political rather than an engineering one. The customary attitude in the mind of the typical City Hall, he said, is that it is easier to do a thing without facts than it is to get such facts for a sound consideration.

An Engineering Problem

The common distribution of special parking privileges, the alderman's insistence that his ward have as many traffic lights as any other ward, regardless of location, and the feeling that "our city expects us to make a big show," which prompts the installation of a needless number of cheap and inefficient control devices, are examples of this political difficulty. Dr. McClintock urged that traffic control be taken out of politics entirely and be treated as an engineering problem.

The formal discussion of this paper was given by E. W. James, chief of the division of design, U. S. bureau of public roads. He spoke of the difficulty of locating federal-aid roads because of the insistence, particularly on the part of the small town, that the highway pass through the center of the town.

Burton W. Marsh, city traffic engineer of Pittsburgh, spoke next on "The Organization and Functioning of a City Traffic Engineering Bureau." If we ask how we are to bring order out of a universally recognized chaos, said Mr. Marsh, we shall get a great many answers and opinions based on isolated experiences. This shows the need of facts, which are best obtained by a scientific study. He cited by way of example the striking result of an investigation of Pittsburgh shopping habits, where it was found that only 2.8 per cent of shoppers parked their cars at the curb. Figures such as this should convince even the hitherto unmovable merchant that parking is hurting his business far more than it is helping it. Like Dr. McClintock, Mr. Marsh also urged that traffic engineering bureaus be created.

Few States Require Driver Tests

The next speaker, Morris O. Eldridge, assistant director of traffic Washington, D. C., told of the work being done in that city. Of particular interest was a form for reporting accidents so designed that the officer used nothing but check marks to tell the whole story. This obviously assists greatly in the compilation of statistics. Mr. Eldridge pointed out the rather striking fact that only sixteen states require tests to secure driving licenses.

H. M. Lewis, chief engineer of the regional planning commission of New York City and environs, spoke next on "Requirements Essential to Adequate Street Transportation." Mr. Lewis stated that no two communities are alike and that no standardized solution of the traffic problem can be made. A traffic survey is therefore necessary. He recommended also improving existing facilities, establishing new traffic routes, instituting night trucking, and preparing a proper zoning plan.

Lucius S. Storrs, managing director of the American Electric Railway Association, next delivered a paper on "The Function of Street Railway and Bus Lines in the Transportation System." Mr. Storrs called attention to the fact that whereas 75 per cent of the public uses the street cars and buses rather than private cars, they have no spokesman save the executives of the transit company. Consequently the public is inclined to think of parking and allied problems as matters of corporate rather than of civic interest. He stated also that wasteful duplication of service should be avoided by having street cars, buses and taxicabs under a single management.

Parking Space Valuable

Burton W. Marsh of Pittsburgh, who spoke at the afternoon session, presided at the evening meeting and introduced as the first speaker L. R. Brown, safety engineer of the New York State Railways, who spoke on "Where Shall They Park?" Mr. Brown presented some interesting figures on the value of street space used for parking which, he affirms, is the most valuable land in the city. He pointed out that if parking was allowed at all in the business district, the ideal time limit was that required to transact the average business. Hence a few minutes during business hours and two to three hours in the evening would be a fair arrangement.

In answer to the question "Where shall they park?" he said that since the downtown streets cannot accommodate more than 3 per cent or so of the total cars in a city, street widening, diagonal parking, and such remedies do not get at the root of the trouble. He recommended, therefore, that parking stations be installed at the end of subway and trolley lines where real estate values are cheaper.

Prof. Lewis W. McIntyre of the University of Pittsburgh next spoke on "Pedestrian Education and Safety." He believes that the pedestrian is not getting a square deal, but states that with conditions as they are it is impossible to give him a special traffic light or to allow him to cross the street in a manner both dignified and safe and at the same time to get traffic through. A compromise is therefore necessary, and the regulations provided by the Hoover model municipal ordinance seem to be as good as any that have been proposed. Professor McIntyre believes, however, that an extensive program of education is necessary in order that both motorists and pedestrians will agree upon and accept whatever necessary compromise is adopted.

Sidney J. Williams of the National Safety Council, who spoke next, echoed Professor McIntyre's sentiment that the pedestrian does not get a square deal and stated that, whatever his faults, the pedestrian has not one tenth as many as has the motorist.

G. C. Kelcey and K. W. Mackall, signal mechanism experts, then spoke of the various types of signals and their relative advantages. Mr. Mackall urged that signal systems be kept as simple as possible and that their adjustment be left in the hands of experts rather than traffic sergeants.

The meeting was concluded by an interesting informal discussion of various phases of the papers presented.

Change in Date of Iowa Meeting

OWING to Election Day falling on Nov. 6 the dates of the operating meeting of the Iowa Electric Railway Association at Cedar Rapids, Iowa, have been changed to Nov. 8 and 9. A great many who would like to attend would be unable to do so if the meeting were held on Nov. 7 and 8; hence the change to Nov. 8 and 9.

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News of the Industry

First Electric Operation Into Boston

Conversion of railroad to Lynn, serving beaches en route, completed in fast time. More than $1,000,000 spent in work

TO THE Boston, Revere Beach & Lynn Railroad comes the distinction of being the first steam railroad to electrify into Boston. At a cost in excess of $1,000,000 the whole system,—line, stations and equipment—has been electrified and on the morning of Oct. 19, electrical train operation was started over the 14-mile route.

New Service Introduced Gradually

Important as was this event, both from the historic and economic viewpoints, it was marked by no ceremonies. As a precautionary procedure the management decided upon a gradual introduction of service by electricity, by placing only one electric train into commission the first day to take its turn among the seven steam trains that continued to make their usual scheduled runs.

One by one the steam trains will be withdrawn as, in the course of a few days, the electric trains prove satisfactory, and it may be a matter of one or two weeks before there is complete electrification over the whole main line between Boston and Lynn. The loop line has been electrified also, but was not quite ready for electric trains when the main line was opened to this new type of service.

So long as any steam trains remain on the line the present schedule will be followed, but a speeding up and an increase in frequency will become possible as soon as the electric trains have the lines to themselves. For a number of days and evenings the company's train crews have been taking the new trains over the line empty to test them, and to train themselves, and two days before the opening of the service to the public, officials of the railroad and of the General Electric Company made an inspection tour over the main line with a two-car train. Among the railroad officials in the party were Gardner F. Wells, president; George W. Wells, vice-president; Albert W. Hemphill, treasurer; Charles J. Curtax, assistant treasurer and secretary; and Charles A. Collins, a director. They expressed their entire satisfaction with the operation.

Running Time Cut

President Wells stated that with complete electric operation it will be possible to reduce the running time between Boston and Lynn by ten minutes, and with the inauguration of express service, by fifteen minutes, saving a third of the time required by the present steam schedule. He said:

Increased speed is not, however, the only advantage resulting from the electrification of the railroad. The new trains can be accelerated to full speed and stopped with exceptional smoothness; smoke, fumes and cinders have been eliminated; brilliant illumination is provided by the electric lights, and there is uniform distribution of electric heat.

Thirteen million people using this road annually, counting the passengers in both directions, will greatly appreciate this great advance and it undoubtedly will serve to increase the traffic over the line, as the road skirts the ocean and a number of beaches all the way and has stations at popular pleasure resorts. In addition to this it is destined to increase the commutation between Boston and Lynn, and one of the especially pleasant features is the elimination of smoke, fumes and cinders from the tunnel through which the line passes as it leaves the ferry pier in East Boston.

Work Started in Spring

The work of electrification was started early this year; the delays in train schedules were inevitable, but they have not been serious. "A great deal of thanks is due to our patrons," says President Wells, "for their patience during the construction period. The work has been completed in record time, without mishap or accident."

Boston has for many years advocated the electrification of the railroads entering the city, as is done in New York, so as to get rid of the smoke nuisance in the suburbs, city and stations. It has been urged also on the grounds of economy, it having been assumed that it would lessen the cost of operation. As a rule the Boston, Revere Beach & Lynn Railroad was left out of consideration in these campaigns for electrification, it being a narrow gage road, ferrying its passengers from East Boston into the city proper. Yet it remained for the "Narrow Gage," as it is popularly known, to do the pioneering work and completely electrify itself almost unexpectedly.

The Boston, Revere Beach & Lynn Railroad was planned 56 years ago, primarily to develop the land now occupied by East Boston and Revere. Actual construction was started on May 23, 1875. The Winthrop branch was started in 1877. At the present time the double-track railroad has more than 600 employees, four ferry boats and 96 passenger cars and 26 locomotives, which are now to be discarded in favor of the electric cars. In spite of the wealth of its equipment, the road has often been taxed to capacity, especially to accommodate the Sunday crowds journeying to and from Revere Beach.

Sixty of the 96 passenger cars of the railroad have been fitted out in the railroad company shops with two motor equipments, and ten additional cars are to be used as trailers. Power supplied by the Edison Electric Illuminating Company, Boston, and the Lynn Gas & Electric Company is distributed along the line after being converted at two substations.

The complete roster of present officers of the company are: Gardner F. Wells, president; George W. Wells, vice-president and manager; Albert W. Hemphill, treasurer; Charles J. Curtax, assistant treasurer and secretary; Daniel P. Abercrombie, Charles A. Collins, Walter Simonds and the president, vice-president and treasurer are the directors.

Use of Grand Rapids Street Cars Urged by City Fathers

THE public is urged by the City Commission to patronize the Grand Rapids Railroad, Grand Rapids, Mich., as much as possible following the utility's August report, which showed a continued decrease in revenue. The Commission's legislative committee said:

We recommend to the citizens that if they wish an up-to-date railway service they patronize the street cars as much as possible.

The August report shows a continued decrease in the number of passengers.

The commission adopted the recommendation.

Ordinance Discussion Resumed in Chicago

City purchase of Chicago surface and elevated lines by amortization over a period of 40 years was bitterly opposed by officials of the two systems at a joint meeting on Oct. 15, with the City Council's transportation sub-committee, the first important discussion to be held since the new ordinances were drafted by the committee last month. The companies' views were set forth by Leonard A. Busby, president of the Chicago City Railway, and by attorneys for the other lines.

Mr. Busby asserted that the amortization plan included in the proposed ordinance would add nearly 4 cents to every fare collected for the entire 40 years, thereby placing an unfair burden on the present generation of car riders. Patrick J. Lucey, counsel for the Chicago Rapid Transit Company, declared that the contemplated annual retirement of $16,000,000 was tantamount in effect to municipal ownership, maintaining

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that it was financially impossible to amortize in 40 years. The ordinance provides for an initial capital of $265,000,000 and for the expenditure of further sums for expensions and betterments to bring the total stock and bonds to $635,000,000 in 40 years. This divided into payments to be laid aside for use of the city in purchasing the entire properties would amount to $16,000,000 a year. Both company representatives also attacked the new ordinance on the grounds that the rate of return permitted the consolidated system was too low.

Although the date for further discussion of the ordinance has not been fixed, the committee's engineer, Major R. F. Kelker, Jr., was instructed to confer with the company representatives with regard to counter-proposals.

Reward for Apprehension of Robbers

The International Railway, Buffalo, N. Y., has offered a reward of $1,000 for information leading to the capture of the three gunmen who robbed the garage of the company at Walden and Lathrop Avenues, and escaped with $2,500. The trio, masked and armed, held up the night watchmen and two other employees.

Temporary Advance Allowed in Los Angeles

The city of Los Angeles, Cal., on Oct. 15 was denied a stay of a lower court order effective that day for 7-cent instead of 5-cent fares on the lines of the Los Angeles Railway. The order made by Justice Sutherland of the United States Supreme Court in chambers means that the 7-cent fare will go into effect and will continue in effect while the Supreme Court is hearing the city's appeal challenging the legality of the 7-cent order.

The 7-cent fare was authorized by a three-judge federal court after the State Railroad Commission had refused to grant the increase. The commission and the city appealed the case together and placed before Justice Sutherland a plea for a stay of execution pending final decision on the appeal. Justice Sutherland placed the appeal before the full court on Oct. 13 and on Oct. 15 denial of a motion was the result.

This case has been the subject of comment before in ELECTRIC RAILWAY JOURNAL, notably the issue of Oct. 13.

Another Step in Baltimore Fare Case

The Maryland Public Service Commission has petitioned the United States Supreme Court for a writ of certiorari in the fare case of the United Railways & Electric Company, Baltimore. The case has been through the Maryland courts and the commission had previously filed a cross-bill with the United States Supreme Court from that filed by the United.

Supreme Court Refuses to Allow Appeal in Denver Case

The city of Denver on Oct. 15 was denied by the United States Supreme Court a review of its case against the Denver Tramway, unsuccessful in the lower courts. Contending that the lower courts had no jurisdiction to authorize a fare of more than 5 cents to be charged by the tramway, the city asserted that a contract providing for the 5-cent fare was still in force.

The case just decided dates back really to the time of the World War, and had its inception in the effort of the Denver Tramway to obtain a higher fare than the 5-cent rate allowed in the 1906 franchise. It was last December that the United States Circuit Court of Appeals handed down a decision upholding the federal district court, declaring, in substance, the Denver Tramway franchise to be perpetual. In so doing it was believed that the court had made final the district court decision restraining the city, but from the decision of the Circuit Court the city sought an order to reopen the case. This plea the Circuit Court denied. The city then sought relief before the United States Supreme Court, despite the fact that that body in January, 1927, had returned the issue to the local courts.

The progress of the issues involved in the litigation were reviewed in their main intricacies in the issue of Dec. 24, 1927, page 1163. The present fare of 8 cents, two rides for 15 cents, yields less than 4 per cent on the court's allowed valuation of $23,514,000

Franchise in Peoria Extended

A 50-year franchise was granted by the Peoria, Ill. City Council recently to the Illinois Traction System, which operates the Peoria car system. The new contract provides for the free use of 4½ blocks of track from a hub at Washington and Walnut Streets and requires the erection of a new depot prior to Dec. 31, 1929. A franchise adopted two years ago was for a 20-year period and the new one is a 30-year extension of that grant.

Duplicate Service in Cleveland Corrected by Rerouting

The first step in untangling the West Side car lines in Cleveland, Ohio, has been taken by the street railway committee of the City Council in unanimously approving a resolution to separate the West Fourteenth and West Twenty-fifth Street car line. The wasteful routing of the West Side lines, involving the operation of 900 duplicate car-miles a day, has been an obstacle to efficient railway management in Cleveland since the historic fights twenty years ago. Heretofore the City Council, which controls service under the Tayler grant, has refused to consider any sort of rerouting. The Council was induced to consider this step only because of the demand of thousands of car riders in the South Brooklyn district for better service. C. M. Ballou, street railway commissioner, backed by the Cleveland Railway declared that better service and regular schedules could not be obtained as long as part of the cars were operated over one route and part over another.

Even with the additional through service on the three branches of the West Twenty-fifth Street line, there will be a saving of $50,000 a year in operating costs, Mr. Ballou estimated. He referred to the substitution of a motor coach on the Scranton Road.

Rehearing Refused on Order to Install Safety Devices

The New York Transit Commission has denied the applications of several surface car lines for rehearings on the recently ordered installation of safety devices on one-man cars. The applications were made as a matter of form to enable the companies to take to the courts their protest against the commission's order, which called for the installation of "dead man's buttons" and other devices. At the request of counsel the commission postponed until the morning of Oct. 24 a scheduled hearing on the pending 7-cent fare application of the Dry Dock, East Broadway & Battery Railroad, a Third Avenue surface system subsidiary.

Fare Decision in Washington Expected Soon

It was stated at Washington, D. C., on Oct. 12 that the Public Utilities Commission of the District of Columbia on Oct. 15 would pass upon the matter of an increase in fare on the local railway lines, but Chairman John W. Childress, of the commission said that the decision would be announced in ten days in the shape of a formal order. This procedure was decided on Mr. Childress said, to give time for proper preparation of the order. He was quoted as follows:

> It is preposterous to contend that we should have another valuation for this case. This is the first rate case that has come up since the Court of Appeals decided the Capital Traction Company's valuation as of Jan. 1, 1925.
>
> Therefore the present valuation of the company is a current valuation. Are we going to say that because the company did not come in and ask for a raise five minutes after the court rendered its decision that it will have to go through another valuation now?
>
> Of course I am not a lawyer and I am giving a layman's opinion, but it seems only common sense to me.

The present carfare rate is 8 cents and six tokens for 40 cents. The rate sought by the Capital Traction Company is 10 cents cash, four tokens for 30 cents. The Washington Railway & Electric Company, which did not ask for a raise, was made a party to the proceedings by the commission and any increase granted will probably be made to apply to both companies.

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Moncton Desires Railway Continuance

Citizens of Moncton, New Brunswick, in a recent poll have refused to entertain the request of the Moncton Tramways Electricity & Gas Company for permission to discontinue the tramway service which, the company asserts, is now a losing proposition. The plebiscite held showed 1,250 electors desired the continuance of the service while 450 voted in favor of the company's request.

The company's proposition had previously been discussed at several meetings of the City Council, the application being made on the grounds that with the street cars and an independent bus company giving service, the railway was being operated at a loss of $10,000 a year. The company offered, if its request were granted, to make a payment to the city of $10,000 cash, transfer to the city its vested rights in the streets on which the cars operate, remove the rails from the unpaved streets and other appurtenances on the entire route and to recondition the streets where the rails had been removed.

Moncton has a population of 17,488.

Testify Decline in St. Louis Traffic—Women to Plead

The St. Louis Public Service Company, St. Louis, Mo., probably will request a straight 10-cent fare if all of the demands of the union workers are granted by the state commission. It is also possible that regardless of the outcome of the wage controversy the company may request a 10-cent fare for cash customers and 7½ cents for those using tokens compared with the present straight 8-cent fare for adults.

Exhibits furnished by the company in the wage case show a steady decline in street car traffic. The progressive decline since 1923 has been as follows: 1923, 292,671,781 revenue passengers; 1924, 279,222,520; 1925, 270,103,400; 1926, 269,555,730; 1927, 258,810,976, and 1928 (eight months) 167,842,381. The last figure is 5,373,989 fewer than the number of revenue passengers carried in the first eight months of the year 1927.

Stanley Clarke, executive vice-president for the company, testified Oct. 12 that the present 8-cent fare was not satisfactory and that a rate of two tokens for 15 cents with a cash fare of 10 cents would be much better. He estimated 95 per cent of the riders would buy tokens. He declined to commit the company to a specific rate it would deem satisfactory, stating this would depend on the outcome of the wage dispute, now before the Public Service Commission for settlement.

Apparently on the theory that the woman always must have the last word in all controversies the Amalgamated Association plans to close its case for increased wages for the carmen and shop workers of the company by placing the wives of the union men on the witness stand to furnish the Missouri Public Service Commission first hand information regarding the actual cost of living in St. Louis.

Shoppers Favored in Memphis

Free street car fares for shoppers on the opening day of its week of sales starting Oct. 6 was furnished by the New Bry's department store, Memphis, Tenn. Many city and suburban residents availed themselves of the opportunity to ride the cars of the Memphis Street Railway purchasing merchandise to the value of $1 or more and receiving two round-trip fare street car tickets.

Federal Inquiry Halted

Representatives of Electric Bond & Share Company challenge authority of Trade Commission. Decision as to right sought

REFUSAL by officers of the Electric Bond & Share Company of New York on Oct. 17 to answer question and produce records as directed by Commissioner Edgar S. McCulloch, who presides over the hearings of the Federal Trade Commission appeared at that time to be likely to result in a suspension of the Federal Trade Commission's investigation of public utilities pending a judicial decision as to the extent of the commission's power.

John F. McLane, counsel for the company, presented the company's objections, which were overruled by Commissioner Edgar S. McCulloch. Later when two officers of the company had refused to answer, Commissioner McCulloch ordered an adjournment until Oct. 23, at which time he ordered the witnesses to reappear for further questioning.

Commissioner McCulloch declared from the bench that "the Electric Bond & Share Company has been willing to co-operate in this investigation only to the extent that it suits its own officers."

"I can only indulge the assumption," the Commissioner said, "that in defying the commission they have something that they are unwilling to let the Senate of the United States known about and the people of the United States know about."

Commissioner McCulloch concluded by declaring that "the commission will proceed to compel its demands by law."

At the outset of the hearing, Mr. MacLane made this statement outlining his company's position:

> The Electric Bond & Share Company entered into this investigation in the spirit of complete co-operation with the Federal Trade Commission. Irrespective of the issue as to whether or not the Senate resolution applies to it, the company has furnished such books, records and data as were material to the inquiry. Since the beginning of the investigation five months ago the company has continuously made available at its offices to a large corps of examiners of the commission a vast amount of material. All of this has been done notwithstanding the great expense and inconvenience to the company and notwithstanding the fact that the commision less than one year ago completed an exhaustive examination of the company's affairs under Senate resolution 329, 68th Congress, without reporting the violation of any law.
>
> The representatives of the commission, however, in one form or another have demanded as a matter of right the privilege of examining all books and papers of the company, whether relevant to the investigation and without specification as to the object of their inquiry.
>
> The present demand leads the Electric Bond & Share Company to request the co-operation of the commission itself in obtaining a speedy judicial presentation of the issues or questions thus raised, to the end that the broad proposition as to the constitutional and legal rights of the government, of the commission and of the company may be promptly determined and delay thereby avoided.
>
> The company wishes only to have ascertained, as its duty to its clients and to its stockholders, its fundamental rights under the constitution and laws of the United States and the limitations upon the rights of the federal government or any commission or body acting under it to make the sweeping demand for a disclosure in detail of its private business and professional undertakings for its clients which are competitive in their nature and would involve the disclosure of costs, employments and transactions wholly private and confidential and not relevant to the inquiry.
>
> Through such co-operation it would seem

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Oct. 24-25*—Public Utilities Association of West Virginia, annual meeting, Huntington, W. Va.**

***Oct. 29-31*—American Institute of Electrical Engineers, first regional meeting of the Southern District, Atlanta, Ga.**

***Nov. 8-9*—Iowa Electric Railway Association, operating meeting, Roosevelt Hotel, Cedar Rapids, Iowa.**

***Nov. 13-16*—National Association of Railroad and Utilities Commissioners, New Orleans, La.**

***Nov. 21-22*—Public Utilities Association of Virginia, Hotel Roanoke, Roanoke, Va.**

***Nov. 21-22*—Central Electric Traffic Association meeting, Auditorium Hotel, Cleveland, Ohio.**

***Jan. 14-18, 1929*—American Road Builders' Association, convention and road show, Cleveland, Ohio.**

***Jan. 23-25, 1929*—Electric Railway Association of Equipment Men, Southern Properties, Houston, Tex.**

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a most comprehensive decision might be obtained for the benefit of all parties.

Mr. MacLane then inquired of Commissioner McCulloch whether the subpoena directed to Mr. Smith was based on authority claimed by the commission under the terms of the Senate resolution directing the inquiry or upon authority conferred by the Federal Trade Commission Act. He also asked if there was any formal complaint before the commission involving the Electric Bond & Share Company.

When the commissioner replied that "I am not here to be catechized by counsel," Mr. MacLane then said:

The document entitled "subpoena" above referred to, is void and without authority of law and beyond the power of this commission to issue, and that the witness is not required to testify before this commission because:

(a) Neither the witness nor the Electric Bond & Share Company is engaged in "commerce" as defined in the Constitution of the United States or the Federal Trade Commission Act.

Because the pending investigation, so far as the same may be within the powers and jurisdiction of this commission, is being conducted under section 6 (a) of the Federal Trade Commission Act and not under section 5 or other sections of said act, and the commission has no authority to issue subpoenas in this investigation.

That this document entitled subpoena is related to and is merely a part of other documents entitled "subpoena" *"duces tecum"* directed to the witnesses A. E. Smith, comptroller and assistant-secretary, and E. P. Summerson, secretary Electric Bond & Share Company, and that said so-called subpoenas *duces tecum* are void and of no effect in that they are in substance general warrants for "unreasonable searches and seizures of papers and effects without 'probable cause' supported by no oath of affirmation, and not describing the place to be searched or the things to be seized, and constitute a deprivation of property without due process of law, all in violation of the Fourth and Fifth Amendments to the Constitution."

Back to Work After Five Months

Reference has been made before in ELECTRIC RAILWAY JOURNAL to the suspension of transportation service some time ago on the system of the Schuylkill Railway at Girardville, Pa. Of this suspension and the one at Pottsville, the *Motorman, Conductor and Motor Coach Operator,* official organ of the Amalgamated Association, said in October:

Division No. 165, Girardville, Pa., suspended work Sept. 29, 1927. At the close of this report, July 31, 1928, there has been no change in that situation. Later, locals upon these same properties, divisions Nos. 118, Pottsville, Pa., and 433, Lansford, Pa., suspended work on the morning of Jan. 6, 1928, under the endorsement of this board. A report upon the cause of this strike was submitted to the last meeting. It was the same cause that resulted in the suspension of work of the members of division No. 165. These two latter divisions were out five months. Under the settlement the members were returned to work on the 1927 wage scale and were to be replaced in employment as soon as the lines were placed in operation.

Interborough Fare Plea Presented

Supreme Court hears both city and company in case in which New York Railway contends five-cent fare to be confiscatory. Commission jurisdiction over city-owned lines the issue

THE claims of the Interborough Rapid Transit Company, New York, to an increased single fare for carrying passengers over the subway and elevated lines of New York City were presented to the Supreme Court of the United States on Oct. 17.

The members of the court listened to a presentation of the Interborough's case by George W. Wickersham and William L. Ransom of New York City. They concluded their arguments shortly before the adjournment of the court for the day. Upon conclusion of the Interborough's case, Charles L. Craig, counsel for the City of New York, started rebuttal arguments, for which he is to be allowed one hour's time, carrying the conclusion of the hearing of the case over until Oct. 18.

In opening the arguments for the Interborough, Mr. Ransom declared that despite all the details and ramifications of the case there was one central issue involved. This issue, he stated, might be phrased as follows:

"Does the public service commission law of New York apply to these rapid transit railways?" or

"Do the provisions of the public service commission law under the statutes of New York enter into and form a part of the fare stipulations in the contracts?"

Mr. Ransom explained that the court below held, that the provision of the law in question do enter into the contracts, under which the Interborough is operating subway and elevated lines through leases from the city. These contracts all provide that the rate of fare shall be 5 cents, and not more. Relative to the elevated lines, it was asserted that there never has been statutory authority to put into the so-called elevated extension certificate a fare stipulation.

Answering arguments of the city and the commission on the previous day that the suit in the lower court was premature, Mr. Ransom pointed out that counsel for the city had made a special and general appearance in the court below and had filed a cross-complaint and thus had submitted to the jurisdiction of the lower court. The City and the Transit Commission therefore are not precluded from complaining that the lower court did not have jurisdiction of the cause, it was declared.

Mr. Justice Brandies pointed out that the suit of the Interborough to restrain the Transit Commission from prohibiting a 7-cent fare was filed in the District Court while the application of the Interborough for an increased fare was pending. He said:

I fail to see where there was a cause of action in equity, the Transit Commission having 30 days, which had not expired at the time the suit was filed, in which to consider the application.

Mr. Ransom replied that the Public Service Commissions Law prohibited the charging of a fare that was unreasonable. By its terms, he said, the legislature delegated to the carrier the power to abrogate and supersede the rate of fare provided in the contracts when such rate became unreasonable and uncompensatory. The carrier could do so upon the filing of its new schedules, he said. He also pointed out that the Court of Appeals of New York had so construed the law in question.

Following the filing of new schedules, Mr. Ransom said, the law provides that the Transit Commission shall hold hearings thereon, 30 days being provided in which to consider and decide the application. At which point Mr. Justice Brandies said:

But you did not give the commission opportunity to pass upon the application before suit was brought.

Mr. Ransom said that before filing the suit the commission had authorized counsel to go into court and challenge an increased fare. That body had announced what it was going to do with the application, and had in every way violated due process before the Interborough brought its suit in the federal court, Mr. Ransom declared.

According to Mr. Ransom the commission had threatened to act so as to deny the Interborough its day in court for an orderly adjudication of its rights as to rates, and to obstruct and overthrow the various steps which the Interborough had from time to time taken, under statutory authorization, to obtain relief from the confiscatory 5-cent fare. Applications in 1920 and 1922 had been denied by the commission, he said. Mr. Ransom stated that the commission entered no order or determination as to the application filed in 1928, but "indicated in every way that the application would be denied." The commission did not hold hearings requested he said.

Mr. Ransom cited to the court various provisions of the public service commissions law of 1907 which, in his opinion, support the Interborough's contention that the contracts which originally call for a 5-cent fare come within its provisions so as to give the commission the authority and duty to make such changes in the rates of fare as will be reasonable and compensatory.

In discussing the decision of the lower court, Mr. Ransom stated that it decided that the public service commission law was applicable to rapid transit rates, and that the new policy as evidenced by the statute, applied to old transit fares as well as any new ones. The fare provisions are subject to the regulatory power of the commission as though the provisions for such regulatory power were written into the contracts in question, the lower court held, it was stated.

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Fact-finding sub-committee of the committee on convention location on Monday, Oct. 15, inspected progress on new Atlantic City Auditorium

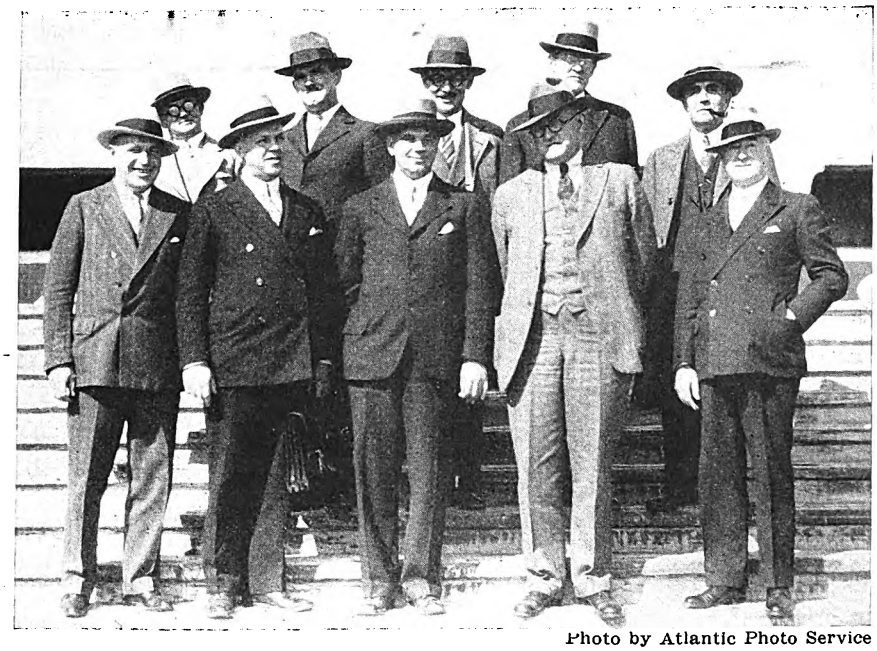

Photo by Atlantic Photo Service

Top row (left to right)—J. C. McQuiston, A. M. Robinson, Charles Gordon, L. S. Storrs and W. H. Sawyer. First row—L. Dickey, F. C. J. Dell, L. W. Shugg, J. P. Barnes, T. W. Casey.

The lower court further held, Mr. Ransom said, that the Interborough had done all it could do under the state laws to obtain administrative relief.

Mr. Justice Brandies inquired:

Isn't your position exactly as if there were no contracts?

In reply Mr. Ransom referred to certain pages of the Interborough's brief in which it is stated that "the fare stipulations of the 1913 contracts must be regarded as qualified by the then existing restrictions of the public service commission law, which expressly required that fares should be, and be kept, just and reasonable, and expressly prohibited fares which were or became unjust or unreasonable, whether excessive or because noncompensatory, and expressly provided that fares not conforming to this legislative standard should be unlawful, and delegated to the carriers the powers and duty of changing rates and terminating the contractual stipulation by filing and publishing tariffs in order to conform to the standard."

"If what you say is the construction of the law," Mr. Justice Brandies commented, "you are entitled to a new fare by reason of state law, and not by reason of the Federal Constitution."

Mr. Ransom further pointed out that though the Transit Commission had held it was without jurisdiction to alter the contract provisions for fares, it had exercised jurisdiction relative to the regulation of services, whereas both the regulation of services and of fares were provided for in the contracts under the same provision.

George W. Wickersham for the railway pointed out to the court the contentions of the Interborough that the present 5-cent fare was inadequate and did not allow the company a compensatory charge. After everything under State statutes had been tried without substantial results, counsel stated, the Interborough finally went into the federal court. This court, consisting of three judges familiar with the situation, he said, granted an injunction to prevent the Transit Commission from prohibiting the charging of increased fares.

In replying to certain questions asked before he began his presentation Mr. Wickersham stated the basis of the relief sought by the Interborough in the court below. Referring to the Public Service Commissions Law, he stated:

As I read the law in the light of the construction placed upon it by the New York Court of Appeals, it was not necessary that there be an order of the Public Service Commission before resort could be had to the Federal court.

This is particularly true, he said, when it is considered that two previous applications of the Interborough for increased fares had been denied by the commission on the ground that it had no power to act thereon, and that the commission, in considering the application made Feb. 1, 1928, had decided it had no power to act thereon and instructed counsel to institute suits in the state courts to enforce the contracts of the city with the Interborough. If the present rate is confiscatory and unreasonable, Mr. Wickersham asserted, a Federal court has jurisdiction of the complaint of the Interborough on the ground that property is being taken without due process of law.

Mr. Craig, counsel for the City of New York, whose presentation preceded that for the Interborough, contended that the rapid transit act, pursuant to which such contracts and elevated railroad certificates were made, is a comprehensive statute excluding any possible subordination to the public service commissions law. He traced the different statutory provisions pertaining to the owning and operating of rapid transit facilities from the rapid transit acts of 1891, by which the city was given the power to place before the people at popular referendum the question of whether the subway facilities should be constructed at city expense and leased out, to the latest legislation permitting the city to enter into a contract with the Interborough.

The Interborough was allowed preferential charges on its earnings in return for the promise of a 5-cent fare, not only for the present time, but for years to come, Mr. Craig asserted. If the city thought, at the time of the execution of contract No. 3, that the Interborough would not maintain a 5-cent fare, it would not have entered into the contract, Mr. Craig added.

The question of the city's power to enter into contract No. 3 was raised by the Interborough in the state courts in a taxpayer's action, brought and prosecuted at its instance, and financed with its funds, and to which it, as well as the city of New York, was a party, he stated. In such action, the power and authority of the city of New York was conclusively established, Mr. Craig pointed out.

The construction placed upon the rapid transit act and the public service commissions law by the statutory court gives such statutes an effect that is in violation of the local self-government provisions of the New York Constitution and the contract and due process clauses of the Federal Constitution, Mr. Craig added.

"The Men Behind Your Transportation Service"

In a 24-page pamphlet the Kansas City Public Service Company, Kansas City, Mo., has reprinted the series of newspaper advertisements dealing with the varied activities "of the finest street railway operating organization in the world," with a foreword by Lou E. Holland, executive manager of the Kansas City Chamber of Commerce, who expresses the opinion that the ads "can not help but build for your company that measure of good will which you seek through the commendable course of embellishing cold facts and making them interesting to your patrons and the public generally."

The ads are unusual in their conception and in their execution, since all of them feature "The Men Behind Your Transportation Service." The ads were very favorably received locally, and their publication in the present form is due in large part to the demand for their preservation in a form more permanent and more readily available for consultation than is afforded in their newspaper dress. The series was prepared for publication under the direction of Bert Sanders of the railway.

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Recent Bus Developments

Pick Up and Delivery Service

Truck Transport to be co-ordinated with other services of the Pacific Electric Railway

ENTRANCE of the Pacific Electric Railway into the field of motor truck transportation was revealed on Oct. 12 upon the filing of articles of incorporation of the Pacific Electric Motor Transport Company with the Secretary of State at Sacramento. Later D. W. Pontius, vice-president and general manager of the railway, confirmed the fact that a plan of this kind was under way.

The objectives for which the new company is formed, the executive stated, include the right to own and operate motor trucks, the right to carry on the business of transporting freight, express and other commodities by motor truck or otherwise, and to conduct a general receiving, forwarding and warehousing business.

In the articles of incorporation as filed, Los Angeles is given as the principal place of business, and the capital stock consists of 5,000 shares of a par value of $100 a share. Officers of the company are not yet named, nor a definite date set by the company for beginning of operations.

In commenting on the organization of the new company Mr. Pontius made the following statement:

Motor trucks, like motor coaches to passenger business, have a definite place in the freight transportation field. One function is to act as feeders to rail lines, and to perform a service between rail stations and the shipper's place of business. To meet these needs the Pacific Electric Motor Transport Company, a subsidiary of the Pacific Electric Railway, is being organized, providing through the use of motor trucks in co-ordination with the rail lines of the Pacific Electric Railway, a thoroughly complete transportation service, including "store-door pick-up and delivery," in Southern California.

The new company will be, in its general character, an express company. It does not contemplate, for the present at least, the operation of trucks on the highways. Briefly the plan of operation is this:

The Pacific Electric Motor Transport Company will perform a complete service from shipper's store-door to consignee's store-door under a through rate that will cover the entire service. The Motor Transport Company's trucks will pick up shipments at the shipper's door and haul them to Pacific Electric Railway's rail stations where they will be transferred to rail cars.

Under a contractual arrangement the Pacific Electric Railway will make the line haul to the station of destination, where the load will again be transferred to the Motor Transport Company's trucks for delivery to the consignee's place of business. The transfer between motor truck and rail cars may be effected either by transferring the entire truck body intact from the truck chassis to specially equipped rail cars, as in the case of bulk freight, or by the usual method of handling between truck and rail car, as in the case of miscellaneous package freight.

The outstanding merit of the entire plan is that by co-ordination with motor truck operations it creates a greater and more efficient use for both motor truck and railway facilities that already are in existence or available.

Full details of the plan of operation will be announced later as will the date it is expected operations will begin.

Expansion in New Britain

The latest substitution of buses for trolleys by the Connecticut Company at New Britain involves the Farmington Avenue line where buses went into service Oct. 10. For the present, however, buses will furnish only a part of the service as trolley cars will be put into use during the rush hours and will be retained on schedule until a complement of buses has been arranged which can supply adequate and complete service. The bus route will carry a mile beyond the present Farmington Avenue trolley terminal.

Respite in Chicago

While motor coach company operates new north side extensions city pins faith on rehearing. State versus city control an issue

FEEDER bus controversies between the Chicago Surface Lines and Chicago Motor Coach Company seemed to reach a temporary standstill following the clash between the opposing parties before the Illinois Commerce Commission and the filing of a petition with the Federal District Court by a group of northwest side business men requesting that receivers for the Chicago Railways be instructed to establish feeder bus service at once in that section of the city.

While the commission announced that it would take no action on the motion of counsel for the Surface Lines to set aside its order of Oct. 2 granting permission to the Chicago Motor Coach Company to operate additional bus routes until after the completion of the present hearing, it refused, however, to order the citation to Leonard A. Busby, president of the Chicago City Railway, to explain by what authority he is seeking to operate feeder buses on the south side of the city.

Mr. Busby announced on Oct. 8 that his company would place fourteen new single-deck, pneumatic-tired feeder buses in operation on the southside streets where service was authorized in the recent ordinances passed by the City Council. James G. Condon, attorney for the Chicago Motor Coach Company, had immediately asked that the street railway executive be cited for contempt.

In taking under advisement the petition of the Northwest Business Mens' Association, on the other hand, Federal Judge James H. Wilkerson intimated that he would deny the motion, although he allowed the petitioners ten days in which to cite reasons for believing the commission order invalid and which might legally permit the court to disregard it.

The Chicago Motor Coach Company, continuing operation of its new north side bus extensions, announced this week that beginning Oct. 15 it would carry children between seven and twelve years at half fare, and children under seven, accompanied by an adult, free of charge, on all lines. Children were formerly charged the full 10-cent rate. The company's application to reduce fares for children was approved by the Illinois Commerce Commission.

By no means have the hopes of the city of Chicago to regain jurisdiction over the motor coaches which run over its streets been dispelled. In fact these hopes were revived on Oct. 5, when the Illinois Supreme Court granted a rehearing in the case of the city against the Chicago Motor Coach Company. If this rehearing should result in a reversal of the decision rendered against the city in the case last June, city officials believe that it will strip the Illinois Commerce Commission of its authority to allow buses on city thoroughfares without consent of the City Council and would compel the Chicago Motor Coach Company to obtain a city franchise.

In its ruling last June the Supreme Court reversed the decision of Circuit Court Judge Hugo Friend. The higher court held that under the public utilities act of 1913 the Commerce Commission has full authority to issue certificates of convenience and necessity for bus lines in the city.

In his petition for a rehearing Assistant Corporation Counsel Leon Hornstein pointed out that unless the decision was reversed the city would lose its constitutional right to control its streets. He argued that the city now has control over the street car lines, but under the court's decision would have no jurisdiction over the motor coach company, with a right-of-way built by the city itself.

The decision on the rehearing bears directly on the current dispute over bus service on the north and west sides of the city, since on Oct. 2, acting under a Commerce Commission order, the Chicago Motor Coach Company started service at a 10-cent fare on approximately 70 miles of new routes in that district, despite the fact that the City Council and civic and improvement societies had demanded feeder buses

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operated by the Chicago Surface Lines on a 7-cent fare. Although the City Council had passed fourteen separate ordinances providing for this type of service, the measures were regarded as being nullified because of the superseding authority of the commission.

Bus Line Succumbs to Railway Competition

The "shortest railroad with the longest list of stockholders in the United States" has done the impossible. Its chief competitor, a bus line, the Andringa & Datema has thrown up its hands and yelled "quits."

Last spring the 700 stockholders of the United Suburban Railway, with 8 miles of track, running from Grand Rapids, Mich., southwest to the village of Jenison, Mich., gathered together to listen to the initial proposal of the bus line officials. The equipment and franchise were offered to the railway for $57,000, but the stockholders deemed the price much too high. They saw little value in purchasing the line. Recently another meeting was held and the price named was $20,000. To eliminate competition and if possible place the stock of the railway upon a dividend paying basis, it was agreed to purchase the bus line. The bus line proprietors agreed to take $16,000 in cash which likely will be raised by sale of stock in the railway and the remaining $4,000 in stock of the interurban line. The purchase involves taking over four buses together with the franchise rights and good will. Tentative plans for operation include running the buses as usual.

September receipts for the railway were reported from $225 to $250 better than in a similar month last year, and in some months this year the receipts were said to have exceeded operating costs by from $650 to $800. "If we can take in from $1,500 to $2,000 each month, in addition to operating costs," Mr. McCarrick stated, "our stock will represent a profitable investment."

The United Suburban Railway was started in July, 1927, about a year after the Grand Rapids, Holland & Chicago Railway succumbed to the competition of the bus lines. A year of bus service and the commuters decided to own their own line. Even though there may be no dividends this year the stockholders aver that the increase in value of property along the right-of-way and the better service justify its program.

To complete the purchase plans it will be necessary to raise $16,000 within the next 30 or 40 days. Application already has been made to the State Public Utilities Commission for permission to take over the franchise and a schedule will be filed with the commission. The old buses will be replaced as rapidly as possible with new lighter and faster equipment.

Upon motion of Wilbur S. Burns of Wyoming Park a resolution was adopted by a vote of 1,974 shares to 34 to give the board of directors power to raise funds to purchase the bus line.

Tentative plans for operation include running one bus from Grand Rapids to Grandville and the other buses from Wyoming Park to Grand Rapids via Beverly and Galewood. The interurban cars will continue to operate from Jenison to Grand Rapids, but if the line of the Michigan Railroad over which the cars operate from the city limits downtown is abandoned, arrangements will be made for bringing the cars into the city over the Grandville Avenue line of the Grand Rapids Railroad. This would necessitate laying a short stretch of track to connect the interurban line with the street car line at Clyde Park avenue. At present the railway is paying the Michigan Railroad about $1,700 a month rental.

Bus Line to Mozart Park

The Ohio Valley Transit Company, a subsidiary of the Wheeling Traction Company, Wheeling, W. Va., has been awarded a permit to operate a bus line to Mozart Park by the Public Service Commission. A 10-cent fare will be charged.

Burlington Will Go to Bus

The Iowa Southern Utilities Company has applied for permission to abandon the rest of its railway system in Burlington, Iowa, and is proposing for city service complete motorization by buses. Suspension of railway service may not be effective until next spring.

Financial *and* Corporate

Segregated from Parent Company by New Illinois Charter

The Chicago & Illinois Valley Railroad, a subsidiary of the Illinois Traction, Inc., was issued a new charter on Oct 1. The new company is incorporated for $1,000,000. Organization of the new company is regarded as indicating that the railway henceforth will be operated independently of the parent company, which recently assumed the name of the Illinois Terminal Railroad.

Formerly known as the Illinois Valley division of the Illinois Traction, Inc., the railway operates an interurban line from Joliet through Ottawa and LaSalle to Princeton, Ill., providing local street car and bus service in the cities of LaSalle and Peru.

The board of directors of the Chicago & Illinois Valley Railroad as listed in the charter of the company is made up as follows: Clement Studebaker, Jr., George T. Buckingham, H. L. Hanley, L. E. Fisher, Henry I. Green, E. W. Fowler, P. L. Smith, D. H. Holmes and E. S. Hight.

Bondholders of Old Kansas City Property Want Hearing

Attorneys for the holders of the second mortgage bonds of the Kansas City Railways, Kansas City, Mo., predecessor of the Kansas City Public Service Company, have applied for a writ of certiorari from the Supreme Court of the United States, in an attempt to get a hearing before that court. The plaintiffs are dissatisfied with being shut out of the reorganization of the property. The Circuit Court in June rendered a decision in favor of the Kansas City Public Service Company. The suit is a part of the receivership proceedings which have been in progress since 1920. Powell C. Groner, president of the Kansas City Public Service Company and its general counsel, is representing the company in resisting the application to the Supreme Court. The petitioning counsel are John W. Davis, Democratic nominee for president four years ago, Edwin S. S. Sundeland, Blatchford Downing and Albridge C. Smith.

Session on Indiana Merger

Inquiry into the proposed Insull power and railway merger, involving a $70,000,000 capitalization, got under way recently before the Indiana Public Service Commission. The first session was devoted to discussion of the proceedings to be followed in the hearing. Interested cities, organizations and individuals will have ten days in which to file objections or views with the commission. The entire question is summed up in whether the Terre Haute, Indianapolis & Eastern Traction Company will be permitted to merge with the Insull light and power interests in Indiana, the resultant corporation to be known as the Indiana Electric Corporation. The purpose of the merger, as stated by its supporters, is to simplify operation, improve service and obtain new capital for the interurban properties, which have been hard pressed for several years.

Six cities, three civic organizations, two labor organizations and an investment dealer entered appearances on the first day and representatives of most of these participated in the discussion on procedure. Cities and towns interested and served by the companies to be merged, total 284, according to a list filed with the merger petition.

While no decision was reached on the question of appraisals, representatives of some of the cities spoke in favor of a complete field appraisal, declaring that only in this manner could the commission be assured that the securities in the merger represented actual property. Attorneys for the Central Indiana Company, the Insull-owned group, said they had appraisals for all but one subsidiary. Attorneys for the railway group stated that they had assumed, since the merger involved noth-

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ing but an exchange of securities, the question of appraisals would not enter, but they were ready to do whatever the commission desired in this respect.

L. E. Waterman, president of the Terre Haute Chamber of Commerce, was one who entered an appearance in favor of the petition. Frank P. Baker, an Indianapolis attorney, entered an appearance in behalf of the Indiana Federation of Labor and the local union of the Amalgamated Association.

Bankers Discuss Baltimore Situation

In a plea for fair play for railway, investment house states clearly the need for preserving the credit of the company

THE current monthly financial letter of Nelson, Cook & Company, Baltimore, Md., for August contained a discussion of the United Railways & Electric Company of Baltimore, its finances and its affairs in general. Necessarily this was brief in its treatment, but the relationship of earnings to credit has become a topic of such widespread discussion and concern that the banking firm was prompted to accede to requests to elaborate the article and discuss with frank detail the company's finances and its appeals to the Public Service Commission and the courts.

Accordingly, it prepared a supplement to the August financial letter written dispassionately, in the interest of fair play and harmony. As investment bankers Nelson, Cook & Company have on numerous occasions materially aided in the distribution of this company's securities to institutions and investors, but entirely aside from this the members of the local firm as citizens and taxpayers have the interests of the community before them. They said:

If anything we may evolve will help to bring home the seriousness of the situation to the Public Service Commission, the railway, the holders of the company's securities, and the public in general, we shall feel that we have not labored in vain. Conciliatory accord should take the place of present discord. The problems which face this corporation menace the welfare of Baltimore.

As the bankers see it the railway is confronted with two distinct problems—transportation and finance. The problem of transportation involves the loss of riders to whatever causes attributable. That problem requires tact, as well as ability, and must ultimately be solved to the satisfaction of all interests, the public as well as the company. At this time, however, finance is the more vital problem, and a restoration of the company's earnings to such a basis as may firmly re-establish its credit, is seriously essential. The bankers, however, devoted their attention to a consideration of the company's financial affairs rather than to its transportation needs. On this matter of credit they said:

Credit is the most important asset one may acquire. It is based on capacity. With a corporation, this means earning capacity. A credit situation reaches the acute stage as obligations approach maturity. The earliest maturity of the railway is Nov. 1, 1929, when $1,500,000 Baltimore Traction Company first mortgage 5 per cent bonds come due. These are followed four months thereafter, in March, 1930, by $2,500,000 three-year 6 per cent unsecured notes. Later, in October, 1931, there will mature $2,850,000 Maryland Electric Railways first mortgage 5 per cent bonds, this being the outstanding balance on Dec. 31, 1927, of an original issue of $4,000,000. Before maturity those bonds will be somewhat further reduced in volume by sinking fund operations. Thereafter still more subsequently, in March, 1932, there will mature $1,300,000 Central Passenger Railway first mortgage 5 per cent bonds. Or, the very considerable sum of approximately $8,000,000, more or less, in about 3½ years. These sums can not be obtained to refund unless the company's credit is restored now.

The majority opinion of the Court of Appeals of Maryland, which opinion was written by Judge Offutt, speaking of the company, uses the following language:

"It appears to be well and economically managed and the market prices of its securities indicate a continued public confidence in its stability as well as its ability to liquidate its obligations."

There may have been something in the record to warrant this statement, but so far as the market values of the securities are concerned the facts are exactly the reverse.

Since 1927, however, the company's most active securities have depreciated in market value in excess of $11,000,000, the average decline being about 20 per cent. Following the decision of the Court of Appeals a few weeks ago—notwithstanding Judge Offutt's attempt to reassure—market values declined about $2,250,000, with the result that the company's active securities are at war-time prices and lower. The bankers say:

It should be remembered further that perhaps $14,000,000 of these securities which have thus declined in value, were issued since the creation of the Public Service Commission of Maryland, and were authorized not only with approval as to price and security, but with language designed to attract the investor to these securities and inspire his confidence sufficiently to obtain his money for public service.

The Public Service Commission of Maryland acquired an excellent repute, its decisions were carefully weighed and were, on the whole, wise. The investor had confidence in the principles laid down by the commission and in the character and integrity of the personnel of the commission to follow up and apply the principles enunciated in its opinions. And so—in the case of the United, while other street railways were experiencing difficulty in selling securities, the Maryland public continued to buy United Railways issues with confidence. These securities have now declined heavily. We do not think the company is charged with any fault. We believe it is clearly and indisputably a failure of revenue—a correctable error, which has produced this result.

There are features about the present situation which are both good and bad. One good feature is that the company is steadily making progress toward the establishment of its right to earn a fair return upon the value of its property—a right which is essential to the immediate, as well as to the future, welfare of both the company and the public.

Some years ago the company was obliged to extend whatever service the Public Service Commission required and to accept any fare fixed by the commission practically without right of appeal on any fundamental issue, for neither the commission nor the railway was in a position to determine what was a just and fair return before the property was valued. Later, the commission by unanimous vote valued the property at approximately $75,000,000. This fixed a basis for determining the proper return to the company, and was the first step forward.

The second step—the rate of return—is now before the courts. The commission has fixed 6.26 per cent as a fair return. On appeal from the commission's decision, the lower court fixed 7½ to 8 per cent as a fair rate. On further appeal, a majority of the Court of Appeals of Maryland expressed an unwillingness to declare that the commission's rate of 6.26 per cent amounted to confiscation. Chief Judge Bond and Judge Parke, however, dissented, and in substance approved the decision that a return of less than 7½ per cent to 8 per cent was confiscatory. On this point the bankers say:

This seems to be in line with all the more recent United States Court decisions. A change of 1 per cent in return would make a difference in the company's revenues of approximately $750,000 a year, and that difference may result in success or lack of it in bankruptcy. To the individual the change in car fare from 8⅓ cents to 10 cents is actually not material, but to the company it may mean credit with service to the public or discredit with financial disaster and no service.

While the judges of the Court of Appeals differed as to the rate of return, they were unanimous in their opinion that the commission had erred in its method of determining depreciation, and they ordered a method which should add materially to the company's revenues and give some considerable reassurance to investors.

The bankers continue:

If the company is allowed a return of only 6.26 per cent instead of the 7½ per cent named by the lower court, new money, if obtainable at all, would probably cost from 1 to 2 per cent more in annual interest rate than it should. The commission and the public may not realize that the burden which this additional 1 or 2 per cent excess in annual interest charges will add to the cost of money will amount to many millions of dollars over a period of years. The question of credit thus means much not only to the company but to the car-riders and the public. As Judge Parke said so admirably in his dissenting opinion:

"A failure to grant such relief invites disaster, and stinted relief often simply

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delays a crisis which when it arrives will prove immediately disastrous to the owners of the utility and in the end to the interests of the public."

Sounder doctrine never was more succinctly stated.

This much has been gained, however, to this point: (1) The valuation has been fixed; (2) a minimum rate of return of 6.26 per cent has so far been allowed; (3) the depreciation decision should add largely to the revenues of the company, and (4) the company now is on its way to a decision establishing a fair return on values.

On the other hand, the attitude of the public and of the Public Service Commission has been such as to create serious concern in the minds of investors. Public utility regulation is sound only to the extent that a commission which has the power to reduce rates, will raise them with equal promptness when earnings do not show a fair return. If rates are raised slowly, reluctantly, and with fearful ears turned to the public, which never wants to pay more, not only is credit destroyed but in the long run the public pays a much heavier bill. Commissions are created, in part at least, to protect the public against itself, and not to give people what at a passing moment they may desire. The public, if it gets what it wants, may be perfectly satisfied—with lack of foresight, not sensing the danger to itself; but there is a class which cannot be fooled and that is the experienced investor. Honeyed words mean nothing to him; he lives on facts. Promises he will accept only if a reputation for keeping promises is maintained and deserved.

In conclusion the bankers say in part:

STATESMANSHIP REQUIRED

We believe the property to be ably and economically managed, but there has been in the policy of the railway for the ten-year period of its travail, a desire to please the public and the commission. The car rider, despite the increase in fare, has always been considered before the owners of the company. The attempt of the company to "get along" on a 7-cent fare and then a 7½-cent fare, when conditions almost as inexorable as the law of gravity were dragging the company toward either a higher fare or financial disaster, is indication that the management, to say the least, was not avaricious. It is a situation which, in the interests of the public, requires statesmanship, frankness, freedom from short-sighted popular influence, and above all, prompt action.

Aside from the serious depreciation which investors have now witnessed in their securities, the future of transportation in Baltimore depends upon these investors being willing again to lend money for public transportation in this city. Destroy that confidence completely and it may be impossible to restore it. Meanwhile the public and the city of Baltimore, as well as the company and its security holders, will suffer. The commission and the railway officials should meet at once, consider the situation as it now exists—as of today—and agree upon steps to remedy this situation pending final adjudication of the different points of view now pending before the courts.

Latin American Holdings Sold to American & Foreign Power

Arrangements have been effected for acquisition by the American & Foreign Power Company, Inc., of public utility interests in Chile and Mexico now controlled by the Whitehall Electric Investments, Ltd., London, England. The principal properties in Chile include the electric power and light and the railway systems in Santiago and Valparaiso, while the properties in Mexico include the electric power and light systems in Vera Cruz, Tampico, Puebla and Orizaba. Railway properties in Vera Cruz and Puebla are also owned. The American & Foreign Power Company is affiliated with the Electric Bond & Share Company.

Would Abandon Ten Miles in New Hampshire

The Massachusetts Northeastern Street Railway has petitioned the New Hampshire Public Service Commission for permission to discontinue 10.84 miles of trackage in Salem, N. H. It is the contention of the company that the lines to be abandoned have not netted enough revenue to pay operating expenses and taxes.

Hearing of Stock Issue of Twin City Subsidiary

The Minnesota Railroad & Warehouse Commission has set Oct. 23 for a hearing on the request of the Minneapolis & St. Paul Suburban Railway, subsidiary of the Twin City Rapid Transit Company, to issue 5,000 shares of stock of $100 par value. The stock is to be awarded to the Twin City Rapid Transit Company in payment of suburban lines bonds which the Twin City Company bought and destroyed at maturity. Horace Lowry, president of the Twin City, says the amount has been carried on his company's books as an indebtedness.

Nebraska Interurban Bought; Survey of Service Ahead

George P. Abel, Lincoln, Neb., has purchased control of the Omaha, Lincoln & Beatrice Interurban, recently permitted by the Nebraska Railway Commission to cease operation because of insufficient patronage to pay running expenses. Mr. Abel has become president, Morris Freshman, vice-president and general manager, and P. J. Meehan, secretary-treasurer. Harvey Musser, Akron, Ohio, one of the original owners, remains a director. The part of the line which supplies trackage to transfer cars from industries in the northeastern part of the city, has never ceased operations.

The new owners expect to develop the industrial feature of the business.

Mr. Abel says that the principal object is to provide a belt line for the industries and to give freight service to the suburbs of Betany and University Place. His own material yards are located on the line. A survey will be made to ascertain if it is possible to secure patronage sufficient to warrant the resumption of passenger service. All the trackage into the heart of the city remains in place except for a strip of eight blocks on Y Street.

The End of St. Paul Southern

Wrecking of the St. Paul Southern Electric Railway between Hastings, Minn., and Inver Grove, a suburb of St. Paul began on Oct. 4. B. W. Harris and Leo Harris, Minneapolis, the most recent purchasers of the line, which was sold on Aug. 23 by court order, began to remove the rails at Hastings. The line mileage is 18.05. It cost more than $600,000 to build and equip, had been in receivership since 1918 and had lost money since 1923, owing to the use of private automobiles and buses. By order of the court the road ceased operation on Aug. 2 on account of lack of funds.

Losses in Muscatine Present Problem

John A. Reed, Cedar Rapids, president of the Iowa Electric Company, which has a contract to furnish transportation in Muscatine expiring on March 17, 1929, has invited the Council to assist him in devising means of continuing the railway lines or establishing bus service. He says the settlement of the transportation difficulties are urgent. Losses for the year ended Dec. 1, 1927, were placed by the company at $12,786 before depreciation.

Two P. R. T. Underliers Ratify Commission's Appraisal

A development in Philadelphia's transit field on Oct. 15 was the acceptance of the Public Service Commission's valuation of their holdings by two of the underlying companies of the Philadelphia Rapid Transit Company, namely—the Philadelphia Traction Company and the Continental Passenger Railway. Both subsidiaries would be taken over by the city under the proposed $139,000,000 acquisition of the underliers' stocks and bonds. The Philadelphia Traction Company holdings have been appraised at $26,287,448.

Stockholders of the Union Passenger Railway and the West Philadelphia Passenger Railway also have ratified the commission's appraisal of their holdings.

Ohio Line to Abandon Operations

Abandonment of service on the Springfield & Xenia Electric Railway has been authorized by the Ohio Public Utilities Commission, which has ordered the company to give the public 30 days' notice. Decreased revenues due to the advances of the auto and bus caused the company to request the right to suspend operations. Dismantling of the line was held up 60 days by the commission, which ordered the company to try to sell the property during that time to any concern that might desire to operate it. No protests against the discontinuance of railway service were made at the hearing by any person or community along the line.

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Personal Items

Change in Los Angeles Line-Up

A complete reorganization of the transportation department of the Los Angeles Railway became effective recently.

The positions of superintendent of operation and assistant superintendent of operation were abolished. George B. Anderson retains the title of manager of transportation and R. B. Hill is now assistant manager.

All business pertaining to trainmen and their duties, including discipline, is now in the hands of the division superintendents and it is up to the platform men to satisfy their division superintendents in regard to their work. Any cases of appeal by trainmen from the decision of their division superintendent will be handled by R. A. Pierson, superintendent of the discipline and merit system.

J. H. Sheridan has been appointed superintendent of employment, instruction and safety. Both the safety department under Mr. Collins and the instruction department under Mr. Healy are now merged with the department of employment, instruction and safety under Mr. Sheridan.

L. A. Recappe, superintendent of schedules, and C. V. Means, traffic manager, report direct to George B. Anderson, manager of transportation.

R. R. Smith, formerly assistant superintendent of operation, has been assigned to special work for the manager of transportation.

The office of director of traffic has been abolished and W. H. Snyder has been placed in charge of the supervising force and the dispatchers' office, with the title of chief supervisor.

F. A. Richards Heads Metropolitan Railway Equipment

Ford A. Richards, formerly vice-president and sales manager American Car Company, St. Louis, subsidiary of J. G. Brill Company, has resigned to become president of the Metropolitan Railway Equipment Company, which will engage in the financing of equipment for electric railways, railroads and other transportation enterprises. Headquarters of the new company will be in St. Louis. Cars will be financed on a rental basis to make it possible for operating companies to acquire new equipment on advantageous terms.

Mr. Richards spent nearly his entire business life in the manufacturing side of the transportation business. He entered this field in 1898 with the Peckham Manufacturing Company. He joined the Brill organization in 1909 in the capacity of Pacific Coast district manager. In the fall of 1918 he was transferred to St. Louis as sales manager of the American Car Company and was subsequently promoted to vice-president.

In his new activity, he will continue in close contact with the local transportation industry. The new enterprise will broaden his interests to include the railroad equipment field as well as electric railways, since the new company expects to play an important part in helping electric railways to finance the replacement of present obsolete rolling stock.

C. Lewis in Salt Lake City

Colonel Lewis, formerly superintendent of the Phelps-Dodge railroads in New Mexico, has been appointed superintendent of the Salt Lake & Utah Railroad, Salt Lake City, Utah, with supervision over all operating department matters. His appointment is made in accordance with the company's policy of consolidating the operating department work under one head. Mr. Lewis' headquarters will be in Salt Lake City. He started his railroad career 30 years ago as dispatcher with the Chicago, Milwaukee & St. Paul. He had similar experience with other midwestern roads before going to New Mexico.

W. R. Hinchman West Penn Treasurer

W. R. Hinchman has been elected treasurer of the West Penn Electric Company, Pittsburgh, Pa., succeeding E. S. Thompson. Mr. Hinchman will be located in the Pittsburgh offices. For several years he has been connected with the American Water Works & Electric Company, New York City, and for the past three years has been assistant secretary and assistant treasurer.

D. P. Guest has been advanced from assistant treasurer to treasurer of the West Penn Power Company and West Penn Railways. Mr. Guest will continue as assistant treasurer of the West Penn Electric Company.

British Columbia Loses Services of R. M. Horne-Payne

After 31 years of service, R. M. Horne-Payne has resigned as chairman of the board of directors of the British Columbia Electric Railway, Vancouver, Canada. To the younger generation of utility men, this will appear only as another retirement but to others this news recalls a story of great courage and enterprise when a young man more than 30 years ago took over the bankrupt street railway systems of Vancouver, Victoria, and New Westminster, and in the face of great odds, financed, extended and broadened their operations into the great system of the present-day British Columbia Electric Railway and its subsidiaries.

The story of the young son of an English barrister, going to Canada to represent the firm of Sperling & Company, his meeting with Sir William Van Horne, president of the Canadian Pacific Railway, and his casual conversation with Sir Frank S. Barnard, at Kootenay Lake, which led to the formation of the British Columbia Electric Railway, is a real business romance.

Rudolph Ruzicka on Cincinnati Commission

Rudolph Ruzicka, president of the Oakley Bank at Cincinnati, Ohio, has been appointed a Rapid Transit Commissioner to fill the unexpired term of the late Richard Greninger. The appointment was made by Mayor Seasongood and confirmed by the City Council. The term of Philip O. Geier expires on Nov. 15, and its is understood generally that the Mayor will appoint some one else to take his place. Mr. Ruzicka has been active in Republican affairs. He was defeated last August for the nomination for the office of county clerk by Frank Lewis, the present Democratic incumbent.

W. J. Henderson, for the last nine years associated with H. C. Hopson of New York, is entering independent practice under his own name. As a consultant and analyst in matter affecting public utility accounts and finances, Mr. Henderson has testified before many courts and commissions throughout the country and is well known in the industry. It will be recalled that for five years Mr. Henderson was with the New York Public Service Commission.

Obituary

Alfred B. Kreitzburg, advertising manager for the Electric Storage Battery Company, Philadelphia, died on Oct. 15. Mr. Kreitzburg began his advertising career with the old Philadelphia *Press* more than twenty years ago. From there, he went to the Philadelphia *North American* and later, to the George W. Edwards Advertising Agency. His connection with the Electric Storage Battery Company dated from 1917. In 1920 he was promoted to the position he held at the time of his death. Mr. Kreitzburg was 43 years old.

Charles E. Jones, an employee of the Chicago street car lines for 46 years and for many years an official of the Chicago City Railway and the Chicago Surface Lines, died on Oct. 6. He began work in the street car service in 1882 as a gripman on the cable cars. Shortly afterwards he was promoted to the position of starter. Later he served as supervisor, assistant division superintendent and division superintendent. He was appointed assistant superintendent of transportation in 1921, but because of ill health returned to the 77th Street depot.

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Material Market Remains Active

Track installations to be made. Three more articulated cars for Cleveland. Ithaca Traction may rehabilitate

DUE to several track extensions, a number of fairly large orders of track and line material have been placed during the past 30 days. To construct a city extension requiring 7-miles of double track, the Toronto Transportation Commission, Toronto, Ontario, has ordered 1,700 tons of grooved girder rails, 100 tons of 7-in. girder guard rails, L.S. section 140-468, and 50 tons of 7-in. girder guard rails, B.S. section 114-234. Other materials ordered for this extension include 14,000 standard Hemlock ties, 18,800 lb. of standard track bolts, 85,000 combination flat tie plates, 1,200 pairs of standard 122-lb. welding splice bars, 117,600 lb. of standard track spikes, and 950,000 granite paving blocks.

The City of Detroit, Department of Street Railways, Detroit, Mich., has ordered the necessary track material for 3 miles of double-track standard construction. Chicago Surface Lines, Chicago, Ill., has ordered an outside curve for Eighteenth Street, and Indiana Avenue, 130,000 lb. of special ground fireclay, 2,320 cast steel fish plates for 9-in. rails, 600 pairs of upset welding plates, 2,000 9-in., 130-lb. Lorain section No. 510, 32-in. standard 12-hole fish plates, 500 1⅛-in. hexagon moil points. Construction equipment ordered by this company includes 1 Smith No. 7S non-tilter, 1 bag concrete mixture, and one Thor No. 241 paving breaker.

Track to Be Constructed

Virginia Electric & Power Company, Richmond, Va., will reconstruct 4,000 ft. of double track on Main Street from Sims to Laurel Streets. Seven-inch 122 lb. girder rail on 7 in x 8 in. x 8-ft. white oak ties with Cary-elastic rail filler will be used in this installation. The Long Island Railroad, New York, N. Y., has been inquiring for 200 tons of steel for a bridge to be constructed in Brooklyn, N. Y.

Property has been purchased by the Oklahoma Railway, Oklahoma City, Okla., on West 44th Street, for use in connection with a freight line now being constructed by the company from West 39th Street to the Belle Isle power station. This will connect the Guthrie-El Reno Interurban Lines of the company which will be the last link in its trunk lines passing through the northwestern, western, and southwestern sections of the city to be used for electric freight hauling.

Omaha & Council Bluffs Street Railway, Omaha, Neb., is laying 1,740 ft. of new double track, including new rails, creosoted ties, and a new concrete base. The cost of this improvement is over $23,000.

Overhead Line Materials

The Pittsburgh Railways, Pittsburgh, Pa., has ordered 25,000 ft. of 7/16-in. soft annealed galvanized wire, 5,000 ft. of 5/16-in. soft annealed galvanized span wire, 5,000 15-in. line ears, 1,000 caps and cones, and 2,000 lb. of welding rods. Other line equipment ordered by this company includes 20 trolley frogs, 50 strain insulators, 300 24-in. trolley protecting armors, and 300 48-in. trolley protecting armors, 30 35-deg. solid crossings, 200 fiber approachs for section insulators, 100 72-in. cable bonds, and 50 No. 8 cone anchors.

In connection with its construction of 7 miles of double track, the Toronto Transportation Commission has ordered 10 tons of No. 00 hard-drawn round trolley wire, 25,000 ft. of 500 M.C.M. triple grade, weatherproof cable, 600 standard 5-in., 6-in., 7-in. x 30-ft. steel poles, and 3,000 brass trolley ears. The City of Detroit Department of Street Railways has ordered wire for 3 miles of double trolley. The Sacramento & Northern Railway, Sacramento, Cal., has ordered $3,500 worth of brackets and catenary construction material. Five No. 4700 low-floor center-entrance type cars are being remodeled for one-man operation by the Pittsburgh Railways.

Springfield Street Railways, Springfield, Mass., plans on purchasing five electric type 25-passenger buses for service on the roads between Springfield and Palmer. Wisconsin Power & Light Company, Madison, Wis., has purchased five A.C.F. urban coaches. Louisville Railway, Louisville, Ky., has accepted delivery of two Mack 6-cylinder 29-passenger city type buses and expects to receive, in the near future, several Studebaker buses.

Three Fageol A.C.F. urban coaches have been purchased by the Interstate Street Railway, Attleboro, Mass. The City of Detroit, Department of Street Railways, has ordered 25 A.C.F. buses.

Pittsburgh Railways has ordered one No. 40 Series Cincinnati all-steel press brake, and contemplates the purchase of two Blecker Blacksmith hammers.

More Cars for Cleveland

The City Council of Cleveland, Ohio, has approved the purchase by the Cleveland Railway of three additional articulated trains to fill out the schedule on Euclid Avenue, making a total of 28 trains for the company.

The operation of articulated trains on Euclid Avenue has resulted in clipping five minutes off the running time, according to Joseph H. Alexander, president of the company. The time is saved in loading and unloading, faster acceleration and deceleration and more speed between stops. Faster schedules have saved in reduced operating expenses the interest on the difference in price between the articulated trains and the old style of motor and trailer.

Deliveries are now being made by the G. C. Kuhlman Car Company of 50 motor cars of 55-passenger capacity. The cars are of the single-end, double-truck, two-man, Peter Witt type. According to Mr. Alexander, engineers for the Cleveland Railway are working on a complete aluminum design for articulated cars.

Lynchburg to Try Birney Car

One of the new one-man, 40-passenger Birney cars of the type exhibited at the Cleveland convention by the St. Louis Car Company will be placed in trial service during the next two months on the lines of the Lynchburg Traction & Light Company, Lynchburg, Va. The only other car of this type in service is being used by the Houston Electric Company, Houston, Tex.

Ithaca Traction to Improve

Steps will be taken immediately to improve the roadbed and equipment of the Ithaca Traction Corporation, Ithaca, N. Y. Announcement of the sale of this property and expected improvements was made in the Sept. 15 issue of the Journal. Additional modern cars will be obtained in the future when it is expected a better schedule can be put into effect. A complete survey of the road will be made at once and as soon as the data are received and studied, a program for improvemen will be commenced.

South Shore Track Construction in Progress

Rail re-laying and siding construction work of the South Shore Line, planned during the latter part of summer, is now in full swing with four jobs in progress. Re-laying of rail in Michigan City from Michigan Street to Sheridan Street, a distance of about 2 miles, has been started. This work calls for 130-lb. rail and paving, with welded rail joints and base plates. The paving base will be concrete, and the ties, treated to prevent aging, will be set in the base. This job is to be completed about the first of the year.

In Gary two construction jobs have been in process for the past several weeks. One is an extension of the Virginia Street siding, a distance of 3,660 ft. eastward from the former switch-point, to make a new high-speed passing track for both passenger and freight

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ELECTRIC RAILWAY MATERIAL PRICES—OCT. 16, 1928

Metals—New York

Copper, electrolytic, cents per lb	15.25
Lead, cents per lb	6.5
Nickel, cents per lb., ingot	35.
Zinc, cents per lb	6.6
Tin, Straits, cents per lb	48.50
Aluminum, 98 or 99 per cent, cents per lb.	23.90
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	53.00
General service	31.50

Bituminous Coal

Smokeless Mine Run, f.o.b. vessel, Hampton Roads, gross tons	4.4
Somerset mine run, f.o.b. mines, net tons	1.9
Pittsburgh mine run, Pittsburgh, net tons	1.8
Franklin, Ill., screenings, Chicago	1.375
Central, Ill., screenings, Chicago	0.675
Kansas screenings, Kansas City	1.875

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, ⅝ in. and larger, cents per lb	2.80
Tie plates (flat type), cents per lb	2.15
Angle bars, cents per lb	2.75
Rail bolts and nuts, cents per lb	3.90
Steel bars, cents per lb	1.95
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.40

Hardware—Pittsburgh

Wire nails, base per keg	2.55
Sheet iron (24 gage), cents per lb	2.75
Sheet iron, galvanized (24 gage), cents per lb.	3.55
Galvanized barbed wire, cents per lb	3.20
Galvanized wire, ordinary, cents per lb	3.00

Waste—New York

Waste, wool, cents per lb	18.
Waste, cotton (100 lb. bale), cents per lb.:	
White	17.25
Colored	13.5

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb	10.8
White lead in oil (100 lb. keg), cents per lb.	13.25
Turpentine (bbl. lots), per gal	$0.535
Putty, 100 lb. tins, cents per lb	5.725

Wire—New York

Copper wire, cents per lb	17.125
Rubber-covered wire, No. 14, per 1,000 ft.	5.3
Weatherproof wire base, cents per lb	17.125

Paving Materials

Paving stone, granite, 5 in., f.o.b. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd., f.o.b.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd., delivered	3.375
Cement, Chicago consumers' net prices, without bags, f.o.b.	2.05
Gravel, ¾-in., cu.yd., delivered	3.375
Sand, cu.yd., delivered	2.125

Old Metals—New York and Chicago

Heavy copper, cents per lb	12.375
Light copper, cents per lb	10.875
Heavy yellow brass, cents per lb	7.125
Zinc, old scrap, cents per lb	3.25
Lead, cents per lb. (heavy)	4.75
Steel car axles, Chicago, net ton	$16.50
Cast iron car wheels, Chicago, gross ton	13.875
Rails (short), Chicago, gross ton	17.50
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.00

service, and the other is a new freight passing track between Buchanan Street and Bridge Street. The Buchanan siding, 3,800 ft. long and of 100-lb. rail, will be converted to main line track on completion, and the present eastbound main will become a center sidetrack. On the west end a No. 20 high-speed turnout will be installed to speed up freight operation.

Rail re-laying and repaving in South Bend is being carried on along La Salle Avenue and Colfax and Orange Streets, a distance of 2,785 ft. Treated ties, stone ballast and concrete paving base will underlie the 100-lb. rail and surface.

New England Transportation Company to Erect Office

New England Transportation Company, Boston, Mass., a subsidiary of the New York, New Haven & Hartford Railroad, is preparing to erect a two-story brick building for office use on the site it purchased several months ago, adjoining the Union Bus Terminal on Worthington Street, Boston. This property will be fitted up for rental and communications made to and from the terminal, so that part of the upper story of the terminal can be rented for offices, as well.

South Shore Adds Two Locomotives

Chicago, South Shore & South Bend Railroad, Michigan City, Ind., has added two more 80-ton freight locomotives to its equipment, the first of which has just arrived at the Michigan City shops. The second, or tenth of the large type Baldwin-Westinghouse engines to be installed in the last three years will arrive within two weeks.

The new locomotives are virtually the same as those now in service, the horsepower being 1,280, the weight 160,000 lb. and the maximum tractive effort 40,000 lb.

Two locomotives of this type were delivered to the railway last spring but due to increased freight, the eight then in service proved inadequate.

In addition to the large type locomotives, two 53-ton switching locomotives are being operated locally by the railway.

General Electric Orders Up

Orders received by the General Electric Company for the three months ended Sept. 30 amounted to $90,328,666, compared with $77,420,263, for the corresponding quarter of 1927, an increase of 17 per cent, President Gerard Swope has announced. For the nine months ended Sept. 30 orders received amounted to $260,686,463, compared with $233,076,091, for the first nine months of last year, an increase of 12 per cent.

Reorganization of Galena Oil

Reorganization plans of the Galena Signal Oil Company of Pennsylvania have been declared operative by the committee in charge in so far as the sale of certain assets to the Texas Corporation, the retirement of the funded debt and the transfer of the remaining assets to a new corporation are concerned. It is reported that more than 80 per cent of the outstanding preferred stock and more than 78 per cent of the common stock have been deposited.

Cincinnati Car and Versare to Merge

Directors of the Cincinnati Car Company and the Versare Corporation have voted affirmatively on the proposal to consolidate the interests of these two manufacturers of transportation equipment.

General plans for this move were prepared some time ago by committees representing the directors of the two companies. Negotiations between the two committees led to the formation of a working plan which was submitted to the directors of both companies. It is this plan which has now been approved by the directorates. Legal details are still to be completed. Consolidation of Cincinnati Car and Versare interests would put together two classes of transportation equipment which will enable the new company to offer a range of transportation vehicles suitable for various classes of railway and highway service.

The Cincinnati Car Company has been a pioneer in the development of distinctive types of light-weight city and interurban electric cars and trucks. Its products also include the new type of air-magnetic track brake which has attracted considerable interest as a means of meeting the hazards of present-day congested traffic conditions.

The Versare organization has pioneered the large capacity motor coach of distinctive design. More recently it has developed two types of trackless trolleys—one of six-wheel and the other of four-wheel design. An unusual feature of all Versare units is the duralumin truss type of body construction.

Thus the new company will be in position to offer a complete line of electric rail, electric highway and automotive transportation units suited to a wide range of operating conditions.

In the consolidation, executive, engineering and sales organization of the two companies will be combined. Announcement of organization of personnel is expected at an early date.

ADVERTISING LITERATURE

General Electric Company, Schenectady, N. Y., has issued bulletins on the subjects of arc welding in G. E. factories, electric drive for gas-electric buses and trucks, type WD-200A arc welder, CR 7009-B 12 across the line type of magnetic reversing switch, G. E. arc welder gas engine driven, type A. W. resistor arc welders, automatic arc welder for steel rail ties, and arc welding in industry.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued reprint 340 entitled, "a 660-hp., 87-ton Oil Electric Locomotive for the Long Island Railroad." This new eight-page publication completely describes the new oil-electric light-weight equipment recently placed in service. Copies of this booklet may be obtained from Westinghouse branch offices.

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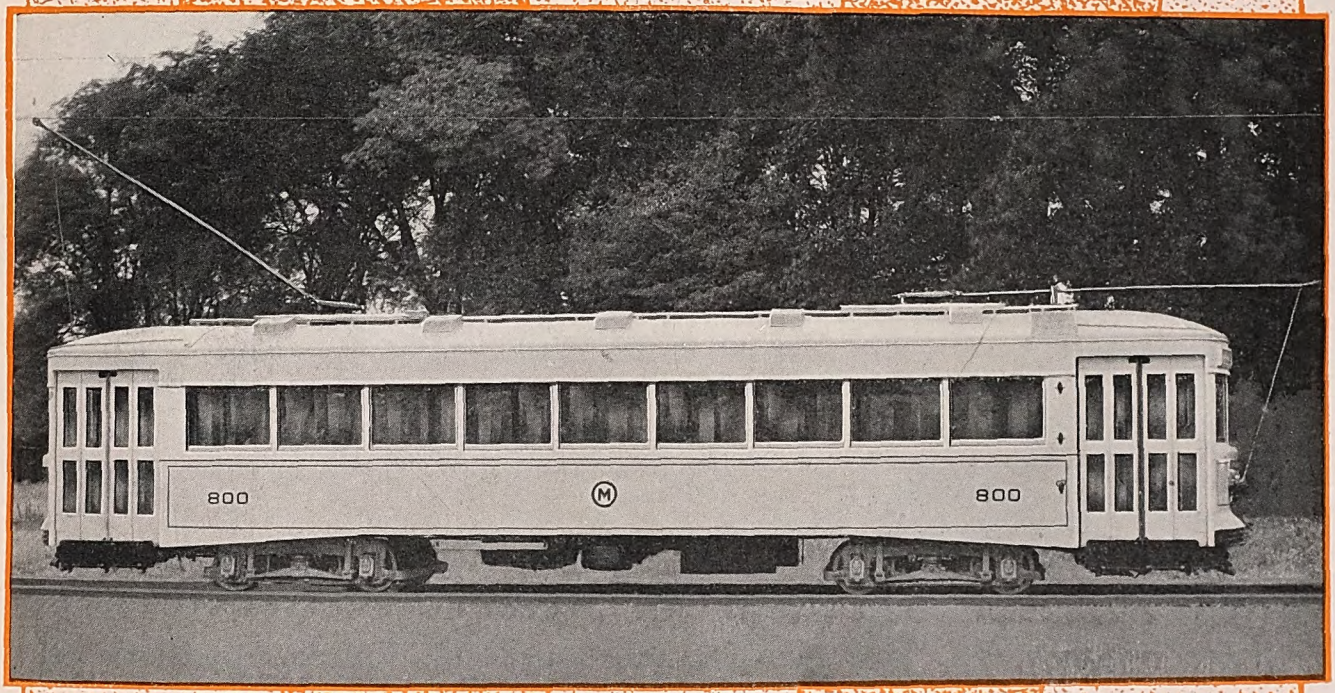

"Sam, This Looks Like the Car for Us"

"Take a look at this Fairmont Car, Sam. Notice her trim lines; simple and plain but mighty attractive. That's her. And practical, too, all the way through. These wide windows and comfortable seats will make 'em want to ride to the end of the line. Yes siree, this car looks like our best bet." If you attended the Convention, you no doubt heard similar comments. Perhaps you, too, were impressed by the pleasing design and sound construction features of this car.

The Fairmont Car, one of ten built by Kuhlman for the Monongahela-West Penn Public Service Company IS thoroughly PRACTICAL and MODERN. These new cars will surely be the means of stimulating passenger revenue.

Let us send you detailed specifications.

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PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

Pacific Coast Representative: Rialto Bldg., San Francisco

BRILL MODERN CARS

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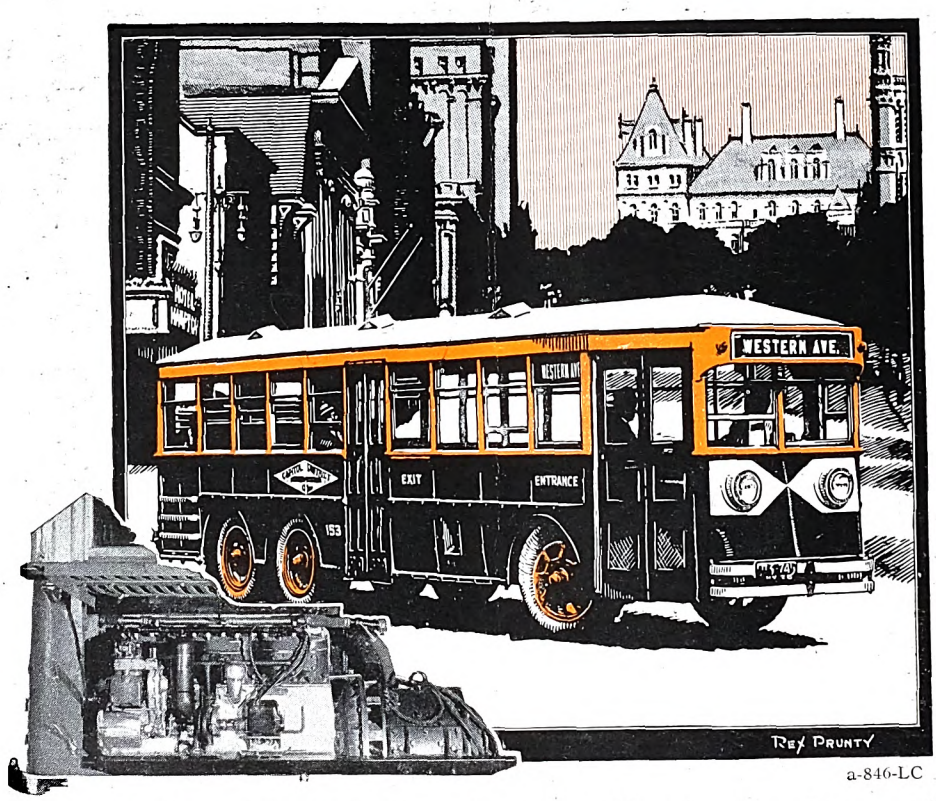

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Versare Gas Electric Coaches are Waukesha Powered

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"Versare insists that every Highway Unit placed in service must perform in accordance with published claims"---the fact that the first Versare and this latest one are Waukesha Powered proves the honesty of the claims that back Waukesha Motor Coach Engines. Field tests prove they "measure up" and increased sales to buswise transportation specialists endorse Versare's selection.

All Waukesha Motor Coach Engines are long-lived, low speed units that meet every rigid test, because they need not strain to meet the normal power demand, because they always have reserve capacity and because they are built by specialists for a special job. Write for "100 Horse Power Easy" Bulletin 691.

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ELECTRIC RAILWAY JOURNAL

Graw-Hill Publishing Company, Inc. OCTOBER 27, 1928 Twenty Cents Per Copy

Buses that *Keep their Youth*

The life span of man is often a matter of *chance*. But the life of a bus is largely a matter of *choice*.

Choose for longer years of service and your selection will be guided by Timken Bearings in steering pivots, differentials, pinions, transmissions, front wheels, and rear wheels.

Then you know that thrust, shock and speed are certain to be capably handled by Timken full radial-thrust capacity. You may be certain of utmost economy of lubricant, maintenance cost and power. You can be satisfied that your original investment will be preserved through Timken tapered construction, Timken *POSITIVELY ALIGNED ROLLS* and Timken electric steel.

That both bus buyers and builders are conscious of these youth-keeping advantages is evidenced by the fact that buses "Timken-Equipped" are fast nearing 100% of the national total.

THE TIMKEN ROLLER BEARING COMPANY
CANTON, OHIO

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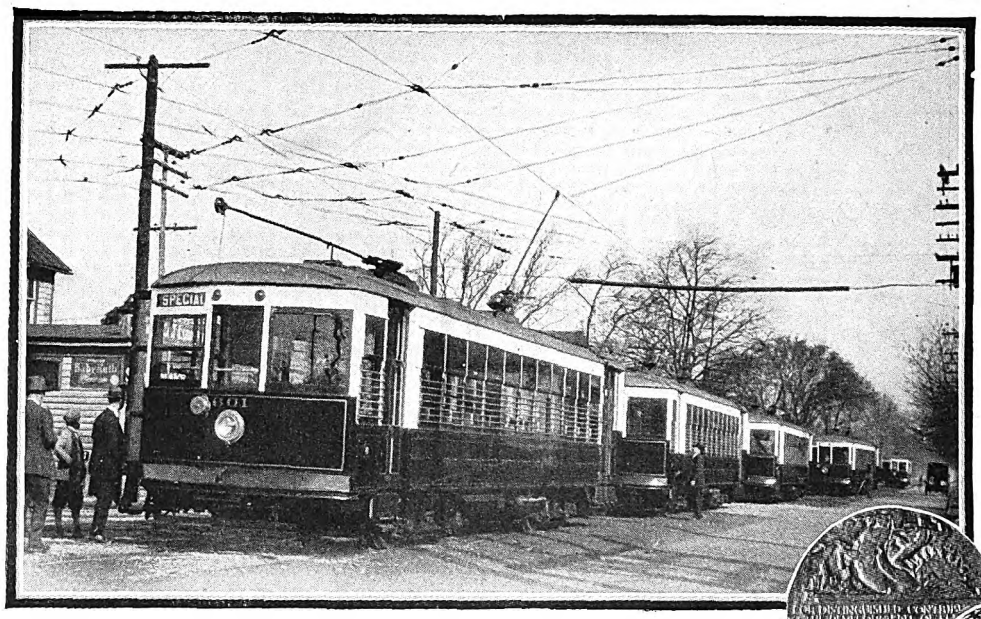

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Increased and demonstrated efficiency, won by frank dealings with the public, the civic authorities and the company's employees, supplemented by the use of new and modernized Westinghouse motor and control equipment, yielded the desired results of increased popularity and prosperity.

Westinghouse Electric & Manufacturing Company
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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of Street Railway Journal and Electric Railway Review
CHARLES GORDON, *Editor*

LOUIS F. STOLL,
General Manager

Volume 72 New York, Saturday, October 27, 1928 *Number 17*

Important Rate Cases Before the Supreme Court

THREE important electric railway rate cases have recently been presented to the United States Supreme Court—those of the Los Angeles Railway Corporation, the Denver Tramway Corporation and the Interborough Rapid Transit Company. The Interborough case was heard last week. The Los Angeles arguments will be heard later, though on Oct. 15 the Supreme Court declined to enjoin the company from collecting a 7-cent fare, pending its hearing of the case. The Denver suit was settled when the Supreme Court, also on Oct. 15, refused to review the opinion of the Circuit Court of Appeals that the company was no longer bound to its 5-cent rate.

Although the Los Angeles case has not been finally settled, at least the historic 5-cent fare in that city has, for the time being been definitely broken. New York and San Francisco alone remain the last great strongholds in large cities, of the tempting political doctrine that the nickel fare is in the public interest. In New York the old fare remains pending a ruling by the Supreme Court, expected within a short period, in which final disposition will be made of the case by that body or it will be remanded to the lower court for final disposition. If the companies in Los Angeles and New York are ultimately successful in throwing off the economic restriction to better credit and the improved service which this in turn makes possible the final passing of the nickel as the price of a ride may be safely predicted. This seems to be a proper time for resolving that the fixed fare idea should never again be permitted to grow up in the public mind, regardless of whether the unit be a nickel or a dime.

Making the Most of the Convention

HISTORICALLY, the convention at Cleveland is a thing of the past, but as a topic of discussion the proceedings at the convention are still a thing very much alive. Tangible evidence of this is accumulating every day. Delegates from the Boston Elevated, for instance, were forewarned that they were expected when they returned to tell what they derived from the convention. By them the topics at the convention are being discussed and rediscussed so that those in responsible positions all along the line may have the benefit of any new ideas. This is an excellent practice, for the convention programs are so laid out as to be both general and specific in their appeal—general as regards what might be termed the over-all topics peculiar to the proceedings of the American Association, and specific as regards the special topics of interest to claims men, accountants, engineers and those in the traffic and transportation departments.

Similarly, other companies than the Boston "L" follow this practice of discussion. This year it was not possible for the Baltimore Company to send its men to the convention. As the next best thing committees were formed among them to comb the printed record of the program and discussions at the meetings, and of the exhibit. To overcome the handicap of not having attended the convention, every phase of the program and exhibit was thoroughly presented in conferences by men specifically assigned to cover various topics. Every idea was analyzed from the standpoint of its application to the Baltimore property. Of course, nothing can take the place of actual attendance at the convention, but on the other hand much of the investment in time and money is lost unless the ideas gathered by delegates are made the basis for action when they return. It is to be hoped that the practice of treating convention subjects as topics of intimate discussion at home will spread, since that is one of the most likely ways in which the good points brought out will be considered in the light of their possible local application. Not everybody can be an originator, but it certainly is possible to follow a given course after the route has been carefully charted by those who have pioneered the way.

Imagination in a Scientific Age

OWEN D. YOUNG has again invested with romance the record of the present age of research and scientific achievement by inviting an historical parallel in his comparison of the Elizabethan epoch with its continuations in our own times. The demand of the Elizabethan period was for imaginative literature, but the thinking that went into the period of the Renaissance, that prompted Columbus to sail uncharted seas and resulted in the voyages of Vasco da Gama and Magellan, playing havoc as these things did with traditional beliefs, finds its parallels today in an age regarded as machine-like and prosaic, but in which imaginative thinking takes its course along different lines.

As Mr. Young so aptly said, modern research reflects the intellectual bent of our times, for the present is the age of a combination of imagination and knowledge. In his own way but no less effectively than did de Kruif in his "Microbe Hunters," Mr. Young in his speech at the annual session of the University of the State of New York, at which the honorary degree of doctor of laws was conferred upon him, brought home the realization that the radio, X-rays and radium bear witness to the reality of the working of imagination along scientific lines. The imaginative thinking of the poets of the past finds its parallel in the work of Edison, Thomson, Rutherford, Langmuir and others. As the first strong race of discoverers may be said to have created a new world, so scientific research is creating a new universe

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by its discoveries. In our own field, it was the imaginative pioneering of Edison, Field, Henry, Sprague, Van Depoele, Siemens and others that spread out cities by making communication easy.

The motor car replaces the horse, the flying machine conquers the air, and radio waves, knowing no physical barrier, become carriers of the valuable intangibles of life to all people everywhere. So the intellect of man blossoms again and makes amazing contributions to human welfare. In the present era of intense living most of us pause merely for a moment in wonder when a Lindbergh hops the ocean and a Zeppelin sails successfully over the seas. It is only when we stop to view these modern feats in perspective that we realize the parallel between our present era and those earlier periods in history when man's quickened imagination drove him forward to accomplishments that changed the course of human progress. We can only speculate upon the destiny toward which the modern world is headed as the result of the present coupling of imagination and science, for in Mr. Young's words, "never was the creative imagination of man working so fruitfully and multifariously."

Baltimore Case Presented to Investors

TO THOSE accustomed to dealing with them, statistics speak louder than words, but the words contained in the recent analysis of the affairs of the United Railways & Electric Company, Baltimore, made by Nelson Cook & Company and digested in last week's issue, should convince the people of Baltimore of the need for restoring the credit of that company. So far as the railway industry is concerned, the statement of the bankers is wide in its appeal since it presents most distinctly the need for preserving the credit status of transportation utilities.

Credit is an ephemeral thing. It is based on capacity —earning capacity. It is here today and gone tomorrow. In most business financial stability is fashioned by the acts of the management. If the management is alert and its fiscal policies sound, its credit rating will be high. But that is not altogether true in the utility business, since superimposed over the acts of the management is regulation by the state that may or may not be sound.

ELECTRIC RAILWAY JOURNAL shares the commentator's views of the situation in Baltimore that the property there has been ably and economically managed. The car rider certainly has been considered first, but the last ten years in Baltimore have been a period of travail. The management has certainly not been avaricious. The history of the fare changes there makes that plain. Still the available statistics show that the company's most active securities have depreciated $11,000,000 in market value since 1927.

The need for refinancing in Baltimore is not far off, yet the bankers say that under economic conditions comparable to those that now exist, new money, if obtainable at all, would probably cost from 1 to 2 per cent more in annual interest than it really should. This is serious. It is serious for the company and serious for the user of the service, since in the end interest and other charges can be met only out of earnings. These things, of course, are elementary, yet the bankers have felt called upon to reiterate them for the benefit of the whole city. Honeyed words mean nothing to the investor. He wants unvarnished facts. And that is what the Baltimore bankers have tried to bring out about one of the most aggravated situations of its kind in the United States.

Facts Seem to Play a Small Part

CLEAR-CUT and incisive was the statement of counsel for the Electric Bond & Share Company to the effect that it had entered into the Federal Trade Commission investigation in a spirit of complete co-operation with the commission, but that judicial determination would be advisable of the right of an inquisitorial body to make sweeping demands for disclosure in detail of its private business and the professional undertakings for its clients, competitive in their nature but wholly private and confidential and deemed not to be relevant to the inquiry. The right of the commission to make the investigation is not questioned.

This, of course, is very different from the construction sought to be put upon the company's position by certain commentators. But could much else be expected when the commission's counsel so far forgot himself as to say that "I can only indulge the assumption that in defying the commission they have something that they are unwilling to let the Senate of the United States know about and the people of the United States know about." That statement is especially unfortunate since no one is in a better position than Commissioner McCulloch to know the extent to which the company has co-operated with the commission in the past. Similarly was it in bad taste for the commissioner to say that "The Electric Bond & Share Company has been willing to co-operate in this investigation only to the extent that it suits its own officers." The remarks show an unwillingness to take into account possible honest differences of opinion over the question of just what is and is not proper. They were particularly unfortunate since, in a previous inquiry, the company was accorded a clean bill of health.

For the sinister aspect which commentators have attributed to the doings of the utilities, particularly their publicity activities, as brought out before the commission, that body is, of course, not responsible, but the commission's attitude has not helped matters. This is not to be construed into a defense of all that the utilities did. Their purposes were sound, but in specific cases their methods were open to criticism, which gave the opportunity for those who sought it to construe piecemeal testimony so as to give the idea of unscrupulous propaganda fostered by subsidized machinery.

To go into the whole matter again is not necessary. The commission cannot be censured for anything that newspapers may say on the testimony it brings out, but it should be on its guard constantly against any act on its part which might be seized upon for conversion into use that tends to misrepresent the attitude of the utilities. It was just here that the commissioners overstepped proper bounds for public agents. It was the apparent right of the company to seek to ascertain the authority of an inquisitorial body to make a sweeping demand for disclosure in detail of its private business and its professional undertakings. It was hardly the right, however, particularly since there was no animus in the objection of the company, of the presiding com-

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missioner to inject comment into the proceedings that characterized the company's attitude to be in defiance of the commission. The general assumption, even in the case of a culprit, is that he is innocent until he is found guilty. The commission's primary function is that of a fact-finding body. But the general results of this investigation, at least so far as the effect upon the public mind is concerned, seem to have little relation to facts. It is obvious, however, that as far as Senator Walsh's political objectives are concerned the investigation is nevertheless proving successful.

Not in Accord with the Spirit of Mr. Cochran's Speech

RECENT distortion of facts by a newspaper, done with apparent deliberation, raises anew the question of whether or not the frankness on the part of utilities toward the newspapers urged by Negley D. Cochran, editor of the *Scripps-Howard News,* in his speech at Cleveland results in fair treatment. There is no need to cite the city. It is important, however, to say that in it a vigorous war is under way among the newspapers for circulation. It may not be that the railway is being picked as the most likely victim for a campaign in the interests of the "peepul," but it certainly does appear that way.

Singled out for special attack has been the de luxe bus service of the railway. So unfair has the characterization of this service been that the conclusion is inescapable that the editor responsible for the publication of the items condemnatory of the service is "out" to get the railway, since the company has been at great pains to make the nature of this service plain. In this particular case the utility has not dealt with the public through lawyers, politicians, lobbyists or so-called publicity experts, but as Mr. Cochran advocated at Cleveland, the matter has been handled by practical operating men who, to use Mr. Cochran's own words, have employed "candor, fairness, honesty and above-board dealing." True, the case is somewhat isolated, but it is one where the railway wants nothing more than a square deal.

Similarly, there is another case before the industry today in which remarkably good work has been done by a company with franchises about to expire which wants an indeterminate permit so that it may be removed from the machinations of politics while the city makes up its mind whether or not it will take over the property and combine the road now run privately with one that is publicly owned and run by the city. Surely this is a reasonable request, yet even the paper that lauds the company for its good work in the past frowns upon the only proposal that would permit the railway to continue giving good service.

Editors are not expected to see eye to eye with the utilities at all times, but since the application of logic on the part of the railways has apparently failed in each of these instances, the question arises whether Mr. Cochran was not over-sanguine about his brothers of the fourth estate always being amenable to the spirit of justice and the square deal. If in these instances the public interest was uppermost in the minds of the editors and their hearts are in the right place, it would take a strange process of reasoning to explain the attitude of these newspapers. On the other hand, it would be comparatively easy to explain if the question of the circulation of these papers overshadowed that of the real public interest with respect to transportation.

Coffin Award Winner Acclaimed Locally

INSTANTANEOUS recognition from all local quarters greeted the announcement by the Virginia Electric & Power Company in the territory which it serves of its having been named to receive the Coffin Award. Of course, one of the criteria that led to the selection of the company was its good work in bettering public relations, but even those who knew well the high esteem in which the company is now held were hardly prepared for the vociferous and laudatory acclaim that followed the announcement that the company was the winner of this coveted honor. One of the leading dailies in Richmond opened its commendatory editorial with this sentence:

"The record that won the Coffin Award for the Virginia Electric & Power Company has been based on the rarest of the world's commodities, consistent common sense."

Comment by the press of the territory has been profuse, but the public response is adequately illustrated by the spontaneous comment from a citizen, a printing concern, and a large corporation since they represent a typical cross-section of the praise that has poured into the Virginia company's office since Sept. 25. Nor is the praise confined to letters. When the buses and cars displayed an announcement that the company was the winner, the most frequent verbal comment was "I'm glad they got it." Typical statements follow:

"I can assure you that the improvement had long been noted, before the above (the award) happened". . . .

"We have noted with pleasure the development of your company since its change in management along the lines which won this trophy, and we feel certain that the award was justly earned.". . . .

"No wonder our company is willing to invest trust funds in the organization. There is a reason behind all its business transactions."

This is some of the concrete evidence of an outstanding reversal of public opinion in the history of a public utility. The editorial mentioned previously crystallized the sentiment of the people toward the company when it thus gave the reason for the metamorphosis:

"Its president has practiced and has preached the doctrine that if a public utility reasonably presented its reasonable requests, it would find councils, executive officers and the public amenable to reason. . . . From the hour this slow-speaking South Carolinian arrived in Richmond, he has dealt candidly with everyone. Always accessible, always good-humored, always on the job, he has probably made as many friends as any man ever did who has lived in the city so short a time. He displays common sense because he has uncommon sense."

The important point is that the directing head of the company has imbued the entire personnel of his outfit with the same spirit and qualities. It is not to be wondered then that the public is unqualified in its praise of the company or that the railway industry has honored with its highest award that common sense which is the product of uncommon sense.

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Many Factors Affect

Car Development

By *Charles Gordon*
Editor *Electric Railway Journal*

This article is based upon an address prepared for presentation before the American Electric Railway Engineering Association at the recent Cleveland convention. Discussions of the paper, prepared by representatives of three car-building companies, will be published in next week's issue

IT IS probably no exaggeration to say that electric railway rolling stock design is one of the most important questions before the industry. The strenuous effort that has been made during these past three years to achieve an adequate and representative car exhibit at the annual convention is strong evidence of the importance attached by the industry to car development. In the fact that many operating companies have been willing to withhold cars from service, and in some instances to defray part or all of the cost of shipping and exhibiting this equipment, there is convincing proof of an interest in the improvement of cars by those who buy them.

Until quite recently, at least, some of the manufacturers and particularly some of the car builders have shown less initiative in car development than have some of the operators. Perhaps that is in a measure justified by the fact that the operator is closer to the car riding public and senses more keenly the need of the times. In any event it is a fact that the car builders have followed rather than led in this movement toward improved rolling stock, and since I make that statement it is only fair to the manufacturer that we go further than the mere discussion of the probable trend or development and examine some of the conditions within the industry itself that exert a strong influence in determining what it is possible to accomplish.

Trade Conditions Are Serious

First of all, the car builders and some of the other manufacturers have been facing a very serious trade situation which has been growing progressively worse for several years. This condition has been considerably aggravated by the present widespread interest in radical developments in cars and trucks. There are a number of contributing factors, for some of which the manufacturers themselves are at least partly responsible. The others are traceable to the practices of some operating companies.

Purchases of cars and car equipment have been at a low ebb for several years. During the first half of this year the number of cars built was at the lowest point of which we have any record. The recession in car buying was first caused by the unsatisfactory financial situation of operating companies and later to some extent by the rapid development of the bus. But during the past eighteen months, there has been a sudden further drop in new car orders, which is now generally attributed to the fact that many properties are holding off needed purchases, while awaiting the outcome of recent experiments in designs and construction. All of this has had a cumulative effect which has aggravated an unsatisfactory trade situation and has put some car builders and equipment manufacturers in a position which is almost desperate.

This situation has a great deal to do with future rolling stock. The progress of an industry such as ours is closely associated with that of its manufacturers, particularly the builders of its principle units of equipment. Unless they are in a position to function as sound business enterprises, the industry suffers through a lag in developments to meet changed conditions. It suffers likewise, from the failure to attract new blood and new ideas. Unless an industry offers an attractive market, those who supply its products turn their attention to other fields or go out of business. New manufacturers, or manufacturers in other fields are discouraged from entering and the stimulus of fresh development and healthy competition is lost.

Since the trade situation in the industry has a strong influence on the development of equipment, it is important, therefore, in considering future rolling stock that we consider practices by operating companies that stand in the way of progress. First of these is a form of rivalry between operating men, particularly equipment men which seriously retards progressive development. At first thought it would seem that this would accelerate improvement. That does not follow, however, because the demand for special ideas in each lot of cars that are built takes the initiative out of the manufacturer's hands and, though there are many changes, they "get nowhere" due to the many individual ideas and the lack of continuity.

Buying Practices Increase Cost

It takes only a casual survey of the wide variety of car widths and lengths, window spacing, door arrangement, wheel sizes, and motor and control equipment, to say nothing of structural details, to realize the serious condition that exists. Not only is quantity production of cars themselves impossible, but the same limitation is encountered by electrical and specialty manufacturers.

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In exaggerated cases an order for a group of 50 cars means a special design job, not alone for the car builder but for a host of other manufacturers of equipment and parts ranging from motors and control to seats, door equipment and body fittings. It is impossible even to approximate the cumulative effect of this situation. There is little question, though, that it has retarded rather than helped the progressive improvement of cars to meet the competition of other vehicles. Furthermore, it has increased the cost of cars. This in itself discourages the replacement of obsolete equipment.

But there are other reasons why some properties continue to hang on to their old cars and why practically a third of the rolling stock now in service is continued in operation long after it has outlived its economic usefulness. Sometimes these cars represent the ideas of a master mechanic or a general manager who takes pride in the claim that they will never wear out. How often have you heard a railway man point out a car and proudly exclaim: "There's a real street car! We bought those back in 1908 and they're in better condition today than when they first went into service." The expression or the date may vary but the general attitude is the same. The more he dictated the design, or the more he had to do with the actual construction, the greater is his pride in that particular car! Here is at least one of the explanations for the dogged determination with which some properties continue to hang on to obsolete equipment. This explains in part also why some properties are spending thousands of dollars in remodeling old cars, which, though they may be equipped with more comfortable seats, sanitary floor coverings or a different color of exterior paint, are still awkward in appearance, noisy, slow and excessively costly to operate.

Car Builders Are Contractors

Car building has become largely a contracting rather than a manufacturing business. The builder influences the details of construction, but rarely sponsors the complete unit as a distinctive manufactured product. He usually builds to the operator's specifications. Consequently, the operator, particularly on the smaller properties, is sometimes sorely perplexed to know just what kind of a car he ought to have. This I believe, exerts a strong influence in discouraging the small property, not equipped with suitable engineering talent, from undertaking to replace obsolete equipment.

For several years I have urged upon car builders the necessity for taking the initiative in developing distinctive cars which could be sold as other manufactured products are sold. But I have been told, however, that street cars cannot be sold in that way because the operating companies will continue to insist upon specifying their own designs. I do not agree with that view particularly as applied to cars designed for service in small and medium-sized cities. The bus manufacturers contended with a similar situation early in their experience and are successfully overcoming it. That doesn't mean that buses are all they should be or that all the bus manufacturers have been successful. The bus is being developed into a practical transportation vehicle and is finding its proper place in the scheme of transportation much faster than would have occurred had the manufacturers given way to the pressure for special designs for every customer. The pressure itself is, of course, a good thing. It forces the manufacturer to recognize the weaknesses that operating experience uncovers in his product. He is, however, not guided by the experience of any single operator. He sifts and studies complaints and troubles and gradually improves his design as a whole.

When I speak of the advantages of buying standard cars from the manufacturers, I mean distinctive models developed by each manufacturer, and gradually improved from time to time as experience and changes in operating conditions seem to make this necessary. There is a definite move now under way to market cars on this basis. The manufacturers who are undertaking to bring about this change in car marketing methods are entitled to commendation and co-operation from the operating men of the industry. I believe, further, that the general character of the street car of the future will be influenced to a considerable extent by the success or failure of this move to change the basis upon which cars are built and sold.

Home Manufacture Bad Practice

A practice upon which there has been entirely too little discussion, and which works directly against the encouragement of development, is that of home manufacture of cars by operating companies. This is only rarely, if ever, in the best interests of even the operating company itself. Most of the reasons advanced are outweighed by other considerations that are frequently overlooked. I have studied this practice carefully on several properties, and have yet to find the electric railway where it can be justified as an economy. There are several simple reasons for the practice. One of them is local pride or personal ambition on the part of the management or the shop executive. The existence of a well-equipped shop is always a temptation to undertake car construction. Another contributing cause is the fact already mentioned, that car builders have been content to serve merely as contractors and have been unwilling or unable to accept the full responsibility for the design and performance of their completed products.

It seems to be the prevalent idea among many operating men that the maintenance executive who shows ability as a manufacturer enhances his reputation in the industry and in the eyes of his superiors. I am sorry to admit that in some instances that seems to be true. But it is not sound, nor is it a good thing for an individual railway or for the whole industry. The maintenance forces on a railway property are not there to manufacture equipment. Their primary function is to keep the equipment already in service at the highest possible state of efficiency and reliability at the lowest possible cost. When a property undertakes to manufacture many of its supplies or its cars most of the supervisory staff is occupied with manufacturing problems while maintenance lacks the supervision which its importance warrants.

On too many of these properties the number of shop and carhouse employees runs high in comparison with other properties operating a comparable number of cars. The cost of maintenance per car-mile is high, and the pull-in record does not compare favorably with other roads. Among the companies that show the best records of low maintenance cost and freedom from equipment failures, manufacturing activity is held to a minimum. When these frequently overlooked elements in the cost of home manufacture are compared with its assumed advantages—which frequently do not actually exist except in the mind of the man responsible for the practice—home manufacture is usually proved to be, at best, an expensive luxury. It can be proved to be unjustified from the standpoint of the individual property, but its harmful effect is even more pronounced in cutting down

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the available market for cars, thereby reducing the stimulus to needed developments in rolling stock.

What are the reasons that dictate some of the recent radical departures from conventional truck and car design? One primary objective stands out above all others. Electric railways must compete with individual automobile transportation, and their cars must be suitable for that purpose. They must meet the requirements of modern conditions, both in their performance and in the impression which they make on the public. They must be in keeping with their surroundings in the modern city. They must be able to keep up with other traffic on the street, and must meet the demand for quick transportation. They must by their very appearance and by the impression which they make on an observer, create the desire to ride in them. There must not be the slightest hint of being out of style. The American public refuses to be associated with anything which gives even the impression of being out-of-date, and it will tolerate such a thing only so long as it is forced to do so. Future rolling stock must be quiet in operation. It must be smooth, and pleasant to ride in. It must be comfortable, convenient, and easy to use. It must, in fact, meet the automobile on its own ground, for the public has become automobile-minded. It must do all this at the lowest possible cost—far below the cost of individual transportation.

This is rather a sizeable order but one which I believe can be filled successfully. Through some of the recent progress that has been made, we are just beginning to see the possibilities. We are feeling our way carefully, but we are going at a rate much faster than some of us who are close to the problem may perhaps realize. It needs only a mental review of the last three exhibits at the conventions to realize how far we have progressed in that comparatively short time. But it is none too fast. The very existence of the industry is dependent on developing equipment to meet the demand of the times.

Large Field for Small Unit

In its general conception there was nothing wrong about the one-man Birney car. In fact, the idea of a comparatively small unit, operated on frequent headway by one man, is, I believe, fundamentally sound for a great many lines in the vast majority of cities in the country. Only when traffic densities go up considerably above the average, are larger units necessary or justified. The electric railway man has always been subject to the temptation to use large units. It seems such a simple way to reduce the cost per seat, or per passenger carried. But of what good is a reduction in cost, if it is achieved by driving away business? Frequency of service is, I believe, equal even to speed in its effect upon the volume of riding. Even from the standpoint of speed, small units have an advantage over large cars, for speed is affected by the number of stops. The smaller the total load carried on a single vehicle, the fewer will be the number of stops which it is required to make. Put this whole matter another way: the smaller the individual unit that is operated, the closer does the service given approximate that of the individual automobile.

The load factor on the system is all too often overlooked in yielding to the temptation to make sure, when selecting new cars, that they are ample in size. The use of larger equipment in the rush hour is, of course, frequently required, but there are cars now available on most properties for that purpose, and in any replacement program, first consideration should be given to equipment for all-day service. This question of the proper size of cars is an important one in considering future rolling stock. There are many comparatively small properties that are saddled with large, heavy and expensive cars, that are losing out rapidly in the race with the automobile, simply because they followed the Scotchman's example of buying No. 12 size shoes since they seemed to be a better buy at the price than the No. 7's though the latter would have been a proper fit.

To repeat, the idea behind the single-truck safety car was sound for a great many lines in many cities, so far as its small size and the implied objective of frequent headway are concerned. But the limitations of the existing type of four-wheel truck were a serious handicap. The appearance and riding qualities suffered. It gave the public too much the impression of a Toonerville trolley. It looked too much like what it actually was—cheap transportation. It is one of the idiosyncracies of human nature, that though we demand economy and an attractive price, we refuse to buy a thing that looks cheap as well, if we can possibly scrape up the money to buy something that "looks" more expensive or luxurious.

The effort to achieve a four wheel car which will overcome some of the limitations of the former one-man safety car is, in my judgment, a step in the right direction and its ultimate success will depend entirely upon its ability to stand up in service and to perform properly over curves and special work and when there is ice and snow on the ground. The advantages of this type of car are so obvious that it seems to justify every possible effort to make it successful.

Need for Improvement Is Urgent

In the field of larger double-truck cars, the present trend toward radical changes from conventional practice dates back only slightly more than a year. Some of the original experimental cars were conceived and built before that, but the industry became genuinely interested in this trend only at the 1927 convention, following the showing of a number of new ideas in cars, and no less than five examples of radical departures from conventional truck practice. The entrance of automotive manufacturers into this field has given additional stimulus to the movement—and some controversy to the discussion.

Obviously, it is unwise to indulge in a wave of enthusiasm for something new and comparatively untried. Nevertheless, the need for improved performance is urgent, and the interest in the new ideas is justified, provided it is not carried to the extreme of holding up all necessary car replacements pending the outcome of experience with the new designs. The tendency toward the latter policy has become very clearly apparent during the past year. It is the subject of grave concern in the industry, especially among progressive operators as well as manufacturers. Needed replacements should proceed while awaiting the outcome of new experiments. Some forward looking properties are buying new equipment on conventional trucks with an eye to the fact that they cannot longer afford to postpone the benefits of new equipment, recognizing that if the new designs should prove to have all of the advantages they promise, there are so many cars to be retired that the worst of them can be profitably replaced now with conventional equipment, which will more than repay its cost in operating savings. The more radical types of construction can then be adopted for the remainder of the replacement program as fast as they are tried and proved in service.

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By co-operating in this work to the extent of purchasing trial equipments, many progressive operators have acted wisely, and have helped to stimulate the continuation of this needed development work.

After all, the great question regarding radical truck and motor designs, is the justification for the change from conventional practice. The objectives sought in these designs are reduced weight and noise, faster and smoother starting and stopping with lighter equipment, and reduced unsprung weight. The latter factor has led to considerable discussion. Reduction in unsprung weight is expected to reduce both noise and the wear and destruction of expensive special work and track. It has been contended by some of those opposed to the new designs that they do not actually achieve lower unsprung weight. To my mind, the functioning of the springs is as important in the consideration of the effect of a given design upon track wear as is the actual weight below the springs themselves.

Many Elements Affect Appearance

As to bodies, the great change will be in appearance, equipment and fittings. Again, this is attributable to the need for meeting public fancy. Only during the past few years have we been giving the question of car appearance serious consideration. In this we have been forced to feel our way slowly, because relatively little attention was formerly given to the appearance of street cars. We are only beginning to understand some of the elements that influence the general effect produced by a car and our progress toward beautiful cars will be accelerated as our experience increases. We are beginning to ask the engineers to fit structural details into a design to produce a given appearance, instead of letting the latter take care of itself after the structural elements are determined. We are in the process of learning just how each element of the design affects the final impression created by a car. A new art of car architecure is getting under way.

We are learning how to use paint effectively to accentuate long, smooth lines in the body. The former practice of car painting was in accordance with the dictates of precedent rather than to achieve any given effect. The object now is to carry color on a car in uninterrupted horizontal bands and to avoid breaks and offsets in the lines at door openings or at the vestibules. There is some tendency to use wider and lower windows and to decrease the width of the letterboard and the arch of the roof so as to avoid giving the car a top-heavy appearance. The distance between the belt rail and the bottom of the side sheets is being carefully studied in relation to the height of windows and the distance to the top of the roof, so as to achieve proper balance in appearance. Attention is being paid to the relation between the bottom of the side sheets, the steps, and the bottom of the bumper so as to avoid awkward breaks and to produce smooth, sweeping lines. In fact, there is consideration being given to many factors that were rarely considered before and these are all for the purpose of making a street car a thing of beauty rather than an eyesore. That this is good designing and good business is proved by the same trend in every other branch of industry from the building of ocean liners to the manufacture of 10-cent store novelties. "Making it look right" is becoming as important to the modern designer as making it work right.

Manufacturers are, in the last analysis, dependent, in making needed improvements, upon the suggestions of the operating man that come from his experience with their equipment in service. Despite all that the manufacturers may endeavor to do, it is, in the last analysis, the equipment men and the operating men on electric railway properties who will determine, through the cars they buy and the cars they do not buy, the future trend of electric railway rolling stock. Right now the manufacturers need active suggestions and co-operation. This is a very critical period in the history of the industry, and without the active co-operation of the equipment men, little will ultimately be accomplished in the present attempt to bring about improvement of rolling stock. But there must be some unanimity of opinion between individual equipment men before any general progress can be made. Individual views and opinions should be co-ordinated and the manufacturer should be able to check the proper course of his developments. This course should be determined by the operating results to be achieved. That is the only sound basis from which to determine the desirable characteristics of future rolling stock.

Attention, Maintenance Men!

DON'T MISS the opportunity offered by ELECTRIC RAILWAY JOURNAL's new maintenance prize contest. Send in descriptions of maintenance ideas developed on your property. In addition to winning an individual prize, you are sure to acquire greater prestige and you will encourage others to submit ideas that will help you to make further improvements in your own practice.

Read the conditions of the new contest, published in last week's ELECTRIC RAILWAY JOURNAL. On every property and in every department there are valuable ideas that have never been made available to the industry.

Get started early! No limit on number of items that can be submitted by any individual, department or company. For the best single item submitted $200 will be paid! Twelve individual prizes of $25 each. Help your company win the maintenance trophy to be presented at the next convention. The JOURNAL will pay $5 for each item published, whether or not it wins a prize! First prizes to be announced in February. Items will be published as rapidly as possible after they are submitted. Don't delay! Win one or more of these valuable prizes. See last week's issue of the JOURNAL for full details.

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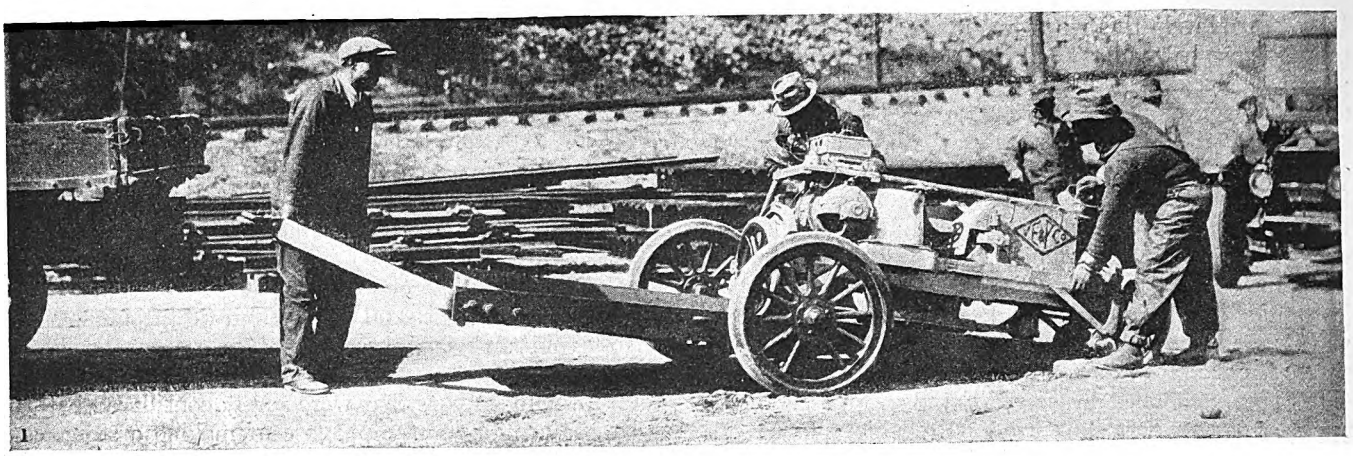
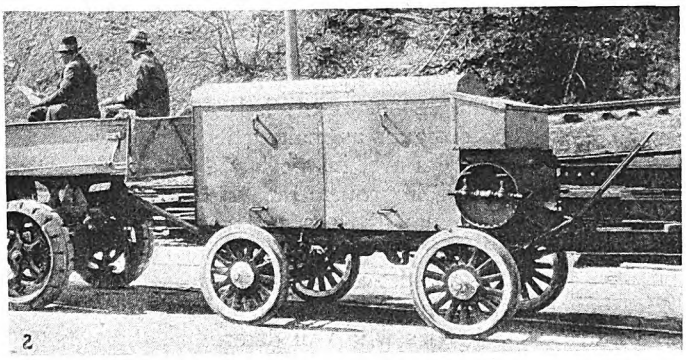
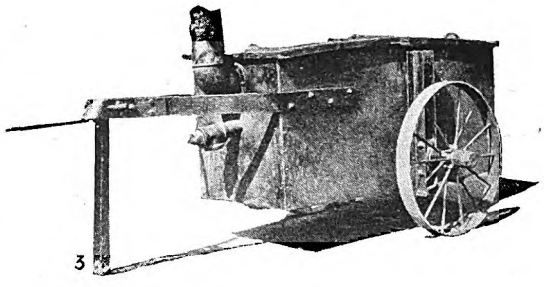
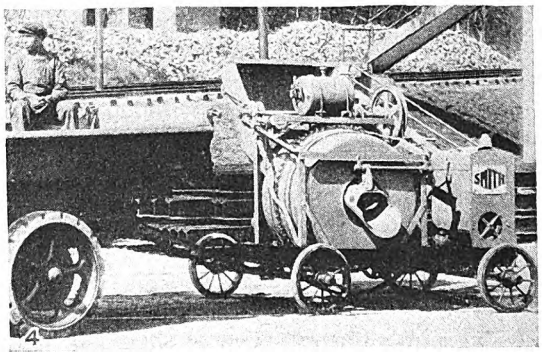


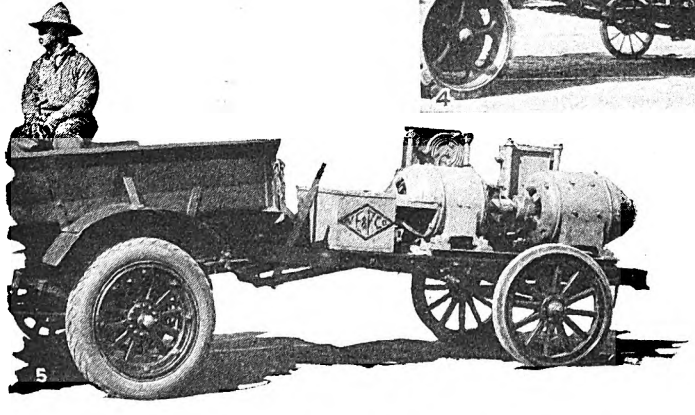




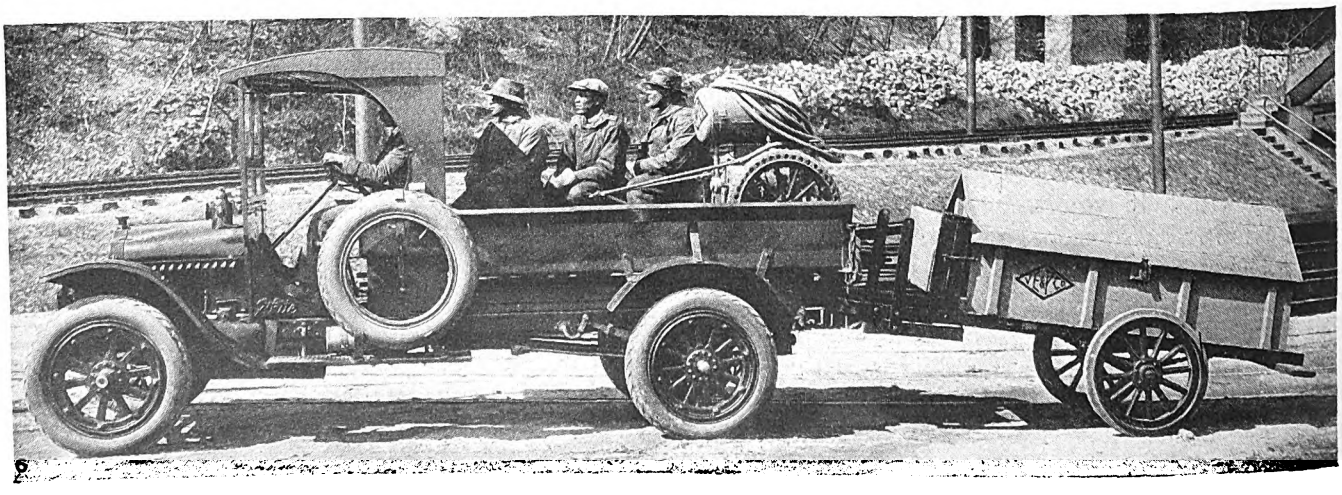
No. 1. Track grinder unit.
No. 2. Portable air compressor.
No. 3. Asphalt heating kettle.



No. 4. Portable concrete mixer.
No. 5. Motor generator unit.
No. 6. Thermit welding unit.



Six Applications of Motor Haulage to Track Machinery



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Keeping Up Track in Virginia

How the Coffin Prize Winner this year was enabled to maintain its track at high efficiency and low cost

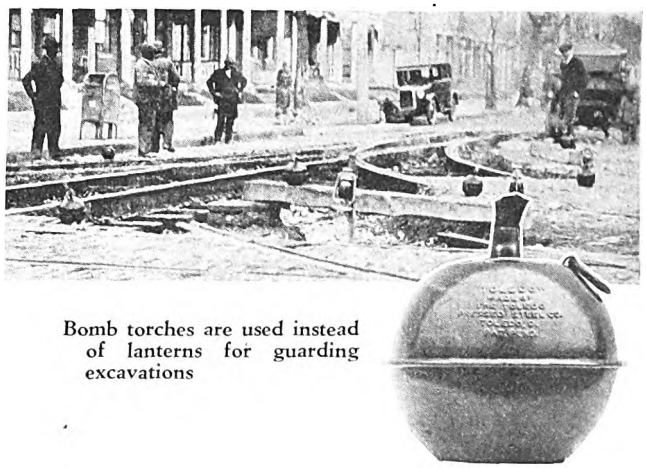
THE foundation of low car maintenance and of comfortable car riding is good track. The notable record of the Virginia Electric & Power Company (published in the Oct. 6 issue) of combining improved track maintenance with higher wages and lower maintenance costs, calls for more details than were possible in that article. Much of the saving came from the use of power-operated, instead of man-operated, track tools. Another gain was from speed in getting the equipment to the job. The accompanying information on the subject has been compiled from the company's brief for the Coffin prize this year.

Track repairs differ from car repairs in that with the latter the job is brought to the shop, while in the former the shop has to be taken to the job. To facilitate the latter practice, the Virginia Electric & Power Company puts a great deal of its track machinery on wheels, so that it can be hauled readily to any track repair undertaking needed. Typical apparatus under such movement or prepared to go are illustrated in the accompanying six pictures. One shows the reciprocating joint grinder unit, consisting of truck, grinder and grinder trailer. Ordinarily six men would be required to load a grinder of this size on a truck, but by the use of the special trailer shown, it is moved about by the two men who operate it. It hooks on to all motor equipment. Another view is of an asphalt heating kettle with wheels and handle by which it can easily be attached to the end of an automobile truck. A third view shows a motor generator welding unit starting out for a job. Its use on a trailer is considered more economical than if it was mounted on its own auto driving equipment. As with the reciprocating grinder unit, the trailer has a low platform to make placing easy. Originally this truck had solid tires, but these have been replaced with pneumatic. Portable concrete mixers and portable air compressing units are also mounted on wheels for easy transport. Still another illustration is of a thermit welding unit of trailer and truck. This is especially useful as thermit is now the standard of the company for all new jobs and some reclamation work.

Bomb Torches and Manganese-Tipped Tampers

When the construction gangs leave a street excavation or obstruction in the evening, they use quite extensively bomb torches instead of lanterns, as a warning to users of the street. One advantage of these torches is that they burn crude oil instead of kerosene. Another is that as they are self righting and unbreakable. They cannot be extinguished unless the flame is smothered. A third is that they can be placed within the track area as readily as outside it. This makes it possible for the track gang to place them more favorably for the warning of traffic.

Reference can appropriately be made here also to a method used by the company to prolong the life of its tamping tools. These tools, as they are purchased from the manufacturer, often wear down after one week of use. Instead of then being discarded, they are tipped with manganese steel. The material used is that employed for manganese switches, and the tip is fastened on by an arc welder. The contact face of the bar is left somewhat rough to secure better work. So repaired, a tamping tool will last six months.



Bomb torches are used instead of lanterns for guarding excavations

Wheels for Making Grooves in Asphalt

In connection with the subject of tools, mention should be made also of a device developed by the way department for forming grooves in asphalt which has been freshly laid directly up to the rail heads. It accomplishes directly what the car wheels would have to do if this device was not used. It consists of an axle with a pair of special wheels with center flanges of proper contour to make the correct indentation in the fresh asphalt.

Waterproof Paving Developed in Richmond

Due to continuous vibration from heavy trains passing over steam railroad crossings on paved streets, the company found it difficult to prevent surface water from entering the foundations of its track in Richmond, where the bond between the crossing and paving usually breaks down. This has been overcome by developing an asphalt and crushed stone mastic, using an asphalt of such high penetration that it remains plastic enough to be sealed by heavy traffic. This paving consists of one 2-in. layer of 2-in. broken stone. After this has been well tamped, all voids are filled with natural lake asphalt. A second

A pair of specially flanged wheels makes flangeways for car wheels in Norfolk

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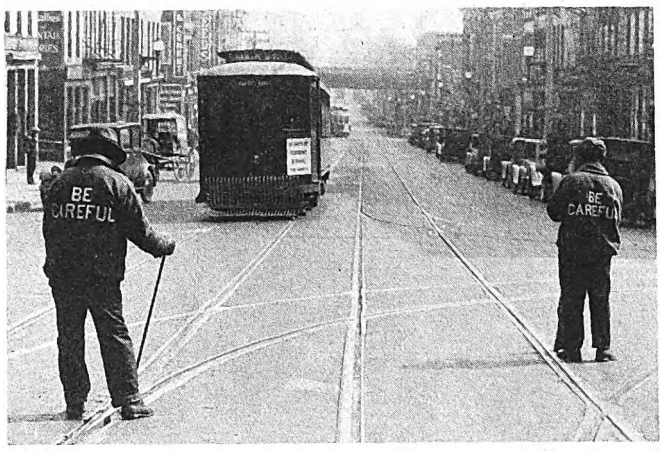


Track greasers and switchmen are safeguarded by bright red jackets bearing the safety slogan "Be Careful"

layer 2 in. thick is made up of ¾-in. stone. After this has been tamped, all voids are filled with more asphalt of the same penetration. Then the top is covered with ¼-in. stone chips, which are rolled in to complete the job. The paving as a whole is carried on the company's standard foundation of 6 in. of ballast and 5-in. concrete slabs.

Track Men Wear Red Jackets

While at work in the street the track men are protected by being permitted to wear bright red jackets. This plan was adopted because, with the congestion which prevails on the streets of Richmond, as in most cities, motorists get into the habit of looking out for other automobiles and often forget that railway switchmen, track or track repair men may be at work. The red jacket used in Richmond makes them conspicuous. In addition, the back of each jacket bears in white 2-in. letters the words "Be Careful." In the view published one of the men is a switchman, the other a track greaser.

Through the co-operation of the local newspapers, this scheme has been given good publicity. Now the public knows that the man on the street wearing a red jacket is working on the track and is not likely to have time to watch out for passing automobiles.

Reclamation a Science

Reclamation is used extensively in the track department. In one part of the track yards are several concrete salvaging bins into which old bolts, nuts and similar fittings are deposited. They are carefully picked over by a man who soon becomes experienced in selecting the good from the bad. Those found available for re-use receive oil and then are sent to live storage.

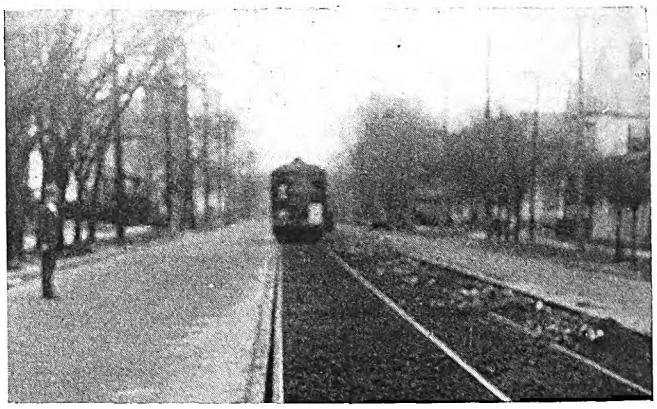
The company has even found a use for old ties and bridge lumber. Instead of being thrown away, they are now hauled to a power saw, where the old timber is cut into fuel lengths to be used under the sand dryer and to heat asphalt. This effects a large saving in labor as well as in the cost of operating the sand dryer.

Several concrete bins are provided for salvaging bolts and nuts

Crowding Two Tracks Into a Narrow Mall

This article will conclude with an account of the way in which a peculiar track problem on the Norfolk division of the company was solved.

A single track, which was laid in a mall between two paved sections of the street was found to be inadequate for the service, and the company wished to substitute double tracks. The mall was only 16 ft. wide, and it was not practicable to secure permission to make it broader by cutting down the width of the paved portions on each side. The track gage in Norfolk is 5 ft. 2 in.



Two tracks replace one within this narrow mall

It was found by careful measurement that if the outside rails were set close to the curbing of the paved portion there would be sufficient clearance between cars on a double-track layout. This was the solution adopted. The outer ends of the ties for each track were sawed off flush with the rail base. The latter was then placed on spiked plates which were lipped around the outside of the base. A concrete footing about 12 in. wide was poured to give extra support to the shortened ties.

This gives a track with a standard centering of 9 ft. 6 in. It is true that the cars slightly overhang the paved portion of the street on each side, but this offers no special operating difficulties.

High Speed Trains in France

RECENT figures on schedule running times of various steam and electric trains in France during the summer of 1928 indicates that high speeds are attained over runs of considerable length. The highest speed listed is for a steam train on the Nord Railway between Paris and St. Quentin, which makes the run of 95.75 miles in an hour and 32 minutes or at a schedule speed of 62.4 m.p.h. The second and third highest speed trains, both electric, are on the Midi Railway between Bordeaux and Dax. This distance is 92.19 miles. One train makes it in one hour and 29 minutes and the other in one hour and 31 minutes. These correspond to a speed of about 62.1 m.p.h. and 60.8 m.p.h. Other high-speed electric trains listed are for the same trains just mentioned but on the return trip from Dax to Bordeaux. On this run one of the trains makes a schedule speed of 59.5 m.p.h. and the other 58.7 m.p.h. The Orleans Railway has an electric train from Aubrais to Paris, covering a distance of 74.37 miles in one hour and 19 minutes.

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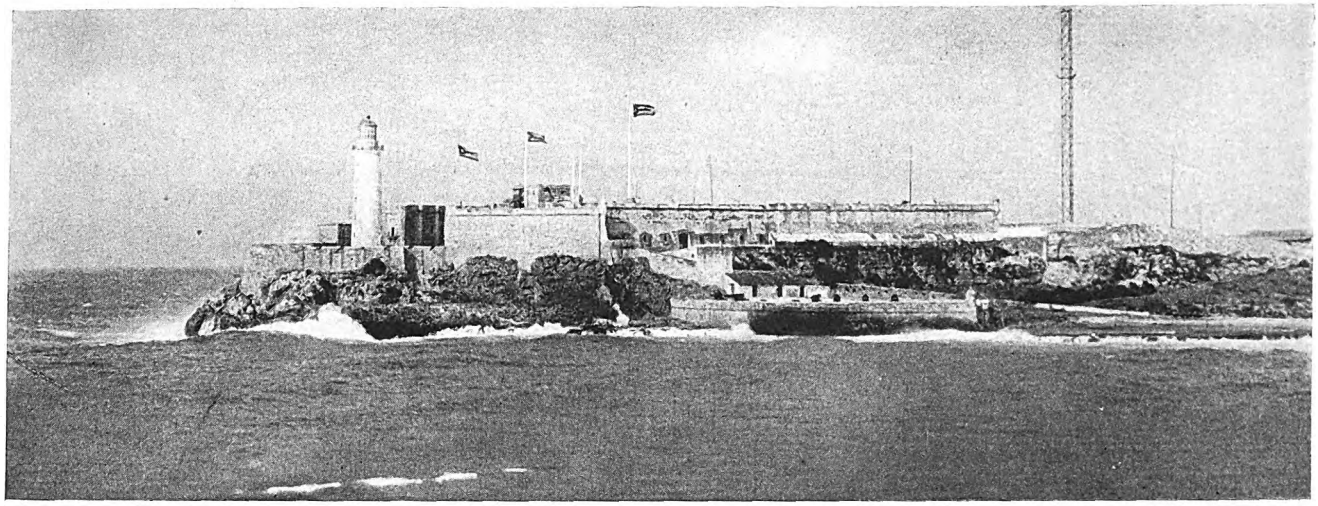

Morro Castle and entrance to Havana Harbor

Havana Carries On

Railway system in Cuba's capital had operating ratio of 78½ per cent in 1927 with 5-cent fare and two trolley wires. Need for jitney regulation if transit facilities are to keep pace with growth of city

By Henry W. Blake
Senior Editor *Electric Railway Journal*

FOR many years the electric railway system in Havana was owned by the Havana Electric Railway, Light & Power Company, which also owned the gas and electric light and power system in that city. On Sept. 1, 1926, however, these utilities were separated by the sale of the electric railway system for cash to a new company. It is known as the Havana Electric Railway Company and was incorporated under the laws of Maine in 1926. The same company also acquired the entire capital stock of the Insular Railway Company, which operates an interurban line from a suburb of Havana, known as Vedado, to Marianao. The new company also owns the local electric railway lines in Santiago and Camaguey, Cuba.

The electric lighting and power company is an Electric Bond & Share property, but the Havana Electric Railway is not, its only connection with the Electric Bond & Share Company or the subsidiaries of that company being through several common officers and directors.

Thus, Frank Steinhart, who for many years has been a prominent figure in Cuban electrical affairs, is the president of the Havana Electric Railway Company and is also vice-chairman of the light and power company. S. R. Inch, E. P. Summerson and William Darbee, respectively vice-president and secretary of the Electric Bond & Share Company and vice-president of the American & Foreign Power Company, are also directors of the Havana Electric Railway. Messrs. Inch and Darbee are also vice-presidents of the latter company and Mr. Inch is a member of its executive committee.

Of the railway systems owned by the Havana Electric Railway Company that in Havana is by far the largest. Including the line to Marianao, with which the Havana city lines are physically connected, the property has 95.24 miles of equivalent single track, as compared with only 11.68 miles in Santiago and 8.6 miles in Camaguey. As will be noticed, the track mileage in Havana, including the interurban line, is less than 100, a comparatively small amount when compared with American trackage for a city with nearly 600,000 inhabitants. But within recent years the conditions for making extensions to the property have not been particularly favorable.

Nevertheless, Havana is growing rapidly and needs more local railway transportation. From a population in 1907 of 297,159 inhabitants, the city grew to 363,506 in 1919, and in 1925 to approximately 563,000. It is the capital of Cuba, has fine buildings, boulevards and hotels, and is becoming more and more a winter resort for Americans, especially since the Volstead act was passed. Commercially also, the city holds a leading position. It has an excellent harbor, and in the city are located the large exporters of the principal agricultural products of the island, sugar and tobacco, as well as the principal distributors of the goods imported into Cuba.

Two factors have combined to retard the physical

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A typical downtown street in Havana with its narrow sidewalks and trolley track at one side of the street. The railway feed wires are supported on struts between the buildings on opposite sides of the street

growth of the railway system. One is the fare on the city system, which is still 5 cents. The other is the larger number of jitneys and low-priced taxis which have been allowed to operate in the city.

The jitneys came in part as the result of the existing business depression in Cuba, caused by the low prices for sugar which have prevailed in the markets of the world now for several years. The Cuban Congress has made several efforts to increase the price of sugar by prohibiting the breaking of new ground for sugar crops, authorizing a limit to the total production in successive years, and in other ways. Owing to the predominant position the sugar industry has in the island its reduced prosperity has been followed by a retrenchment in many other lines of commercial activity, with consequent acute unemployment. Quite a number of workmen normally employed in established industries were forced to seek a means of livelihood more or less precarious by engaging independently as bus operators. During 1927 and the early part of 1928, approximately 800 jitney buses were operated in the city of Havana and adjoining districts. Most of them were owned by their drivers, or by small companies having not more than a few buses, and passengers were carried for 5 cents.

On many streets the sidewalks are within colonnades. Here, as elsewhere in narrow streets, the span wires are attached to walls of buildings, rather than to poles

Mayor Issues Decree

The chaotic condition brought about in local transit by the operation of this type of bus, however, finally moved the city authorities to take steps to reform it On March 20 of this year the Mayor of Havana issued a decree calling for a number of changes. According to the decree, future licenses for bus operation are to be issued only to companies or individuals having no less than eight buses, which all must be of the same model and size and painted the same way. To secure safety, the buses have to comply with certain specifications. Operators must specify the route on which they intend to operate, the fare to be charged and the capacities of their buses. Passengers must not be admitted in excess of this specified capacity. Each licensee must operate his route between 5 a.m. and midnight and must post a copy of the proposed schedule in each bus. The times that the buses leave and return to their terminals must be registered and must be reported weekly to the authorities. A conductor as well as a driver must accompany each bus. Ninety days were specified in this decree as the time permitted jitney operators to comply with its regulations. As a result of this decree, the number of independent buses have considerably decreased during the last few months and the railway earnings have improved.

Before the issue of this decree the jitney buses operated in Havana were of a great variety of types but the body usually seated from 20 to 24 passengers and was mounted on a truck chassis. These chassis were of all makes and ages. Besides these jitneys, one bus company in Havana operates 44 modern Mack buses of considerably larger capacity than the jitneys mentioned.

It is hard to tell whether these jitney buses were profitable during this period when they were free to make their own schedules. Probably some of them were, and are still, because the first cost of the equipment could not have been very much and the operators were also the owners and willing to work for ten or eleven hours a day. But whether they made money or not, they undoubtedly took a great deal of traffic from the railway. Since they did not have to file any reports it is impossible to give a definite statement of the average number of passengers carried daily or annually. Local estimates credited them with carrying about 125,000 passengers a day. As the railway carries about 275,000 passengers, it will be seen that the jitneys were doing about 30 per cent of the local business and the railway about 70 per cent. It was very easy for a jitney operator to get a franchise, as he only had to specify the route on which

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There are many broad streets and fine residences in the newer portions of Havana

he expected to run and then start in carrying passengers for 5 cents each.

While these buses in many ways have been a nuisance, in a sense some of them are a public convenience, in that they have been supplying transportation to certain sections of the city which at present do not have railway service. The reason for this is partly because Havana has expanded so rapidly during the past few years that it has outgrown its railway system, and partly because very little new track has been built during the past few years. The jitney competition and the low fare have discouraged the construction of extensions.

Taxicab Fares Are Low

Besides the jitneys, the electric railway system has to contend with the taxicabs, the fares in Havana being unusually low. The city is divided into districts, and the fare on the lowest price taxicab, when the trip is within one district, is 20 cents for one or two passengers. As the greater part of the downtown section of Havana is within one district, this minimum fare is very common. By the hour, the charges for one or two persons are $1.60, for three people $1.70, and for four persons $1.80. These prices apply to the small taxicabs, such as Fords and other small cars. There are a few larger cars which charge a higher rate.

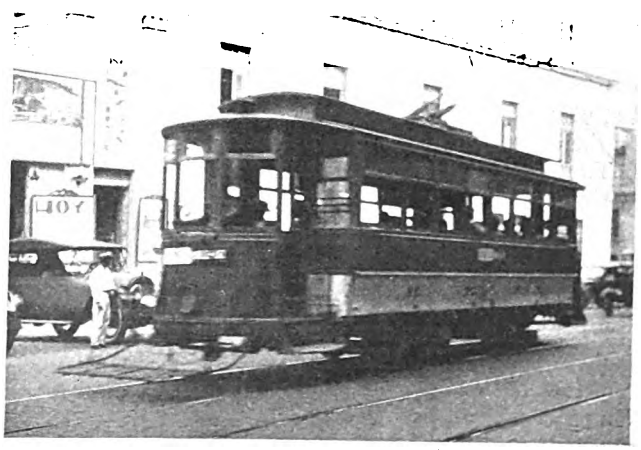
Equipment

All of the cars of the electric railway line of Havana are mounted on single trucks and are designed for two-man operation. There are two types, one seating 32 passengers, and the other 36 passengers. An experimental one-man car is being built.

Most of the bodies of the present cars were built in the company's shops. One reason for this has been lower unit costs of labor and material. Hard woods are particularly cheap in Cuba, for many, including mahogany, are native. Another reason for home construction is the tariff and shipping charge on car bodies that have to be imported. The trucks are generally McGuire or Brill, with 30-in. cast-iron wheels. The motors are General Electric.

The Havana street railway system was electrically equipped during the American occupation in Cuba, following the Spanish-American War in 1898, and at the insistence of the American military officers then in control, the double trolley system was adopted. It is still in use, making Havana one of the two large cities anywhere, where this system is employed. Cincinnati is the other. Over some tracks in Havana two No. 000 hard-

Some jitneys in Havana are of this type with cross-seats. Others have closed bodies with longitudinal seats



Short cars are necessary in Havana because of the small clearance on many curves in the downtown streets. The standard Havana car is mounted on a single truck and of course has two trolley poles

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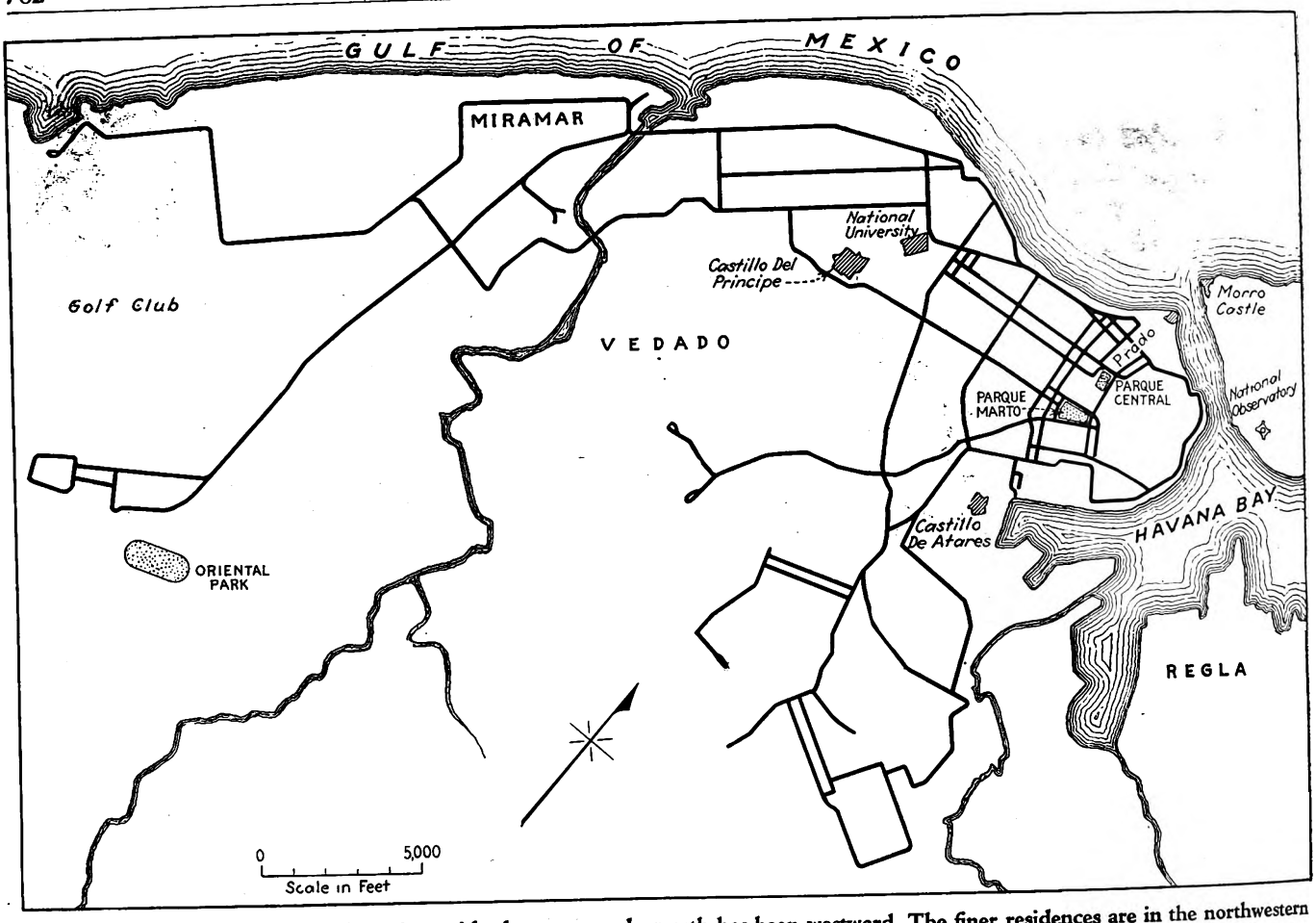

The city of Havana is surrounded on three sides by water and growth has been westward. The finer residences are in the northwestern part of the city in the direction of Vedado and Miramar. This map shows the local electric railway lines

drawn copper wires are used overhead, and over some track a smaller bronze wire is employed.

The double trolley construction requires, of course, two trolley bases on the roof of the car. At one time the company had some trouble with electrical leakage and short circuits between these two poles, hastened by dirt and grease which collected between them. By the heavy rains which occur in summer a film of water was caused to form on the trolley bridge. The difficulty was finally overcome by the design of a special trolley base support which is thoroughly protected from the weather by being painted with a special varnish. The method was described in the ELECTRIC RAILWAY JOURNAL for Nov. 12, 1927, page 907. On the other two properties of the company, at Santiago and at Camaguey, the single trolley is used with ground return. The double trolley is also used on the interurban line of the Havana Electric Railway from Havana to Marianao, and the single trolley on the electrified steam lines operating out of Havana.

The track in Havana is built with an 89-lb. grooved section rail, laid on a concrete foundation.

FINANCIAL STATISTICS AND OPERATING CONDITIONS

An abstract of the operating report of the Havana division of the Havana Electric Railway from Sept. 1, 1926, when the company took over the operation of the system, to Dec. 31, 1927, is given in the accompanying table. The Cuban dollar is of the same value as the United States dollar and American paper currency is used extensively throughout the Republic of Cuba.

While the streets in the more modern portions of Havana are wide, some of those in the old sections are so narrow that they permit only one line of traffic.

OPERATING REPORT OF HAVANA ELECTRIC RAILWAY
(HAVANA DIVISION)

	Sept. 1—Dec. 31 1926	Jan. 1 — Dec. 31 1927
Operating Revenues		
Transportation revenues	$1,918,756	$5,478,196
Non-transportation revenues	17,985	96,005
Total operating revenues	$1,936,741	$5,574,201
Opera ing Expenses and Taxes		
Maintenance	$220,165	$617,290
Transportation	1,164,653	3,345,747
General, including taxes	133,878	413,228
Total operating expenses and taxes	$1,518,696	$4,376,265
Net revenues from operation	$418,045	$1,197,936

When a broad automobile passes through, there is little space between its sides, and the sidewalks. Typical views of narrow streets with car tracks accompany this article.

On the water front the belt line of the company has to cross the entrances to a number of the principal piers. To avoid interference with traffic, it is carried on this portion of its route on an elevated structure. Passengers board and leave the cars at stations.

The railway operates from 36 to 38 different routes and has an ingenious system of route designation for the cars. As shown by the map, the city is in the form of a fan, and all car routes, with one exception, after leaving their terminals in the outskirts, loop through the city, and return to the same terminal from which the car started. The route that is the exception loops through the city like the others but returns to a different terminal.

Every car route sign carries both a number and a letter. There are six letters, indicating terminals, and seven numbers, each number indicating a different loop.

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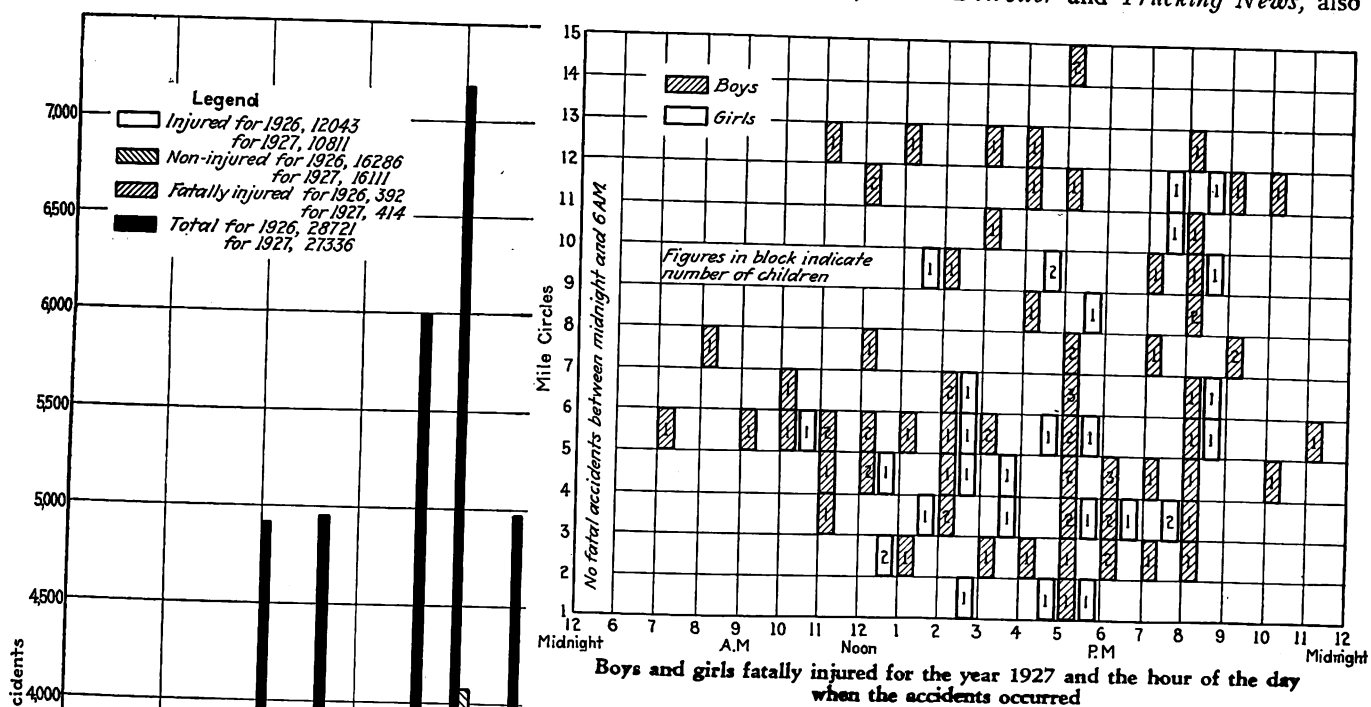
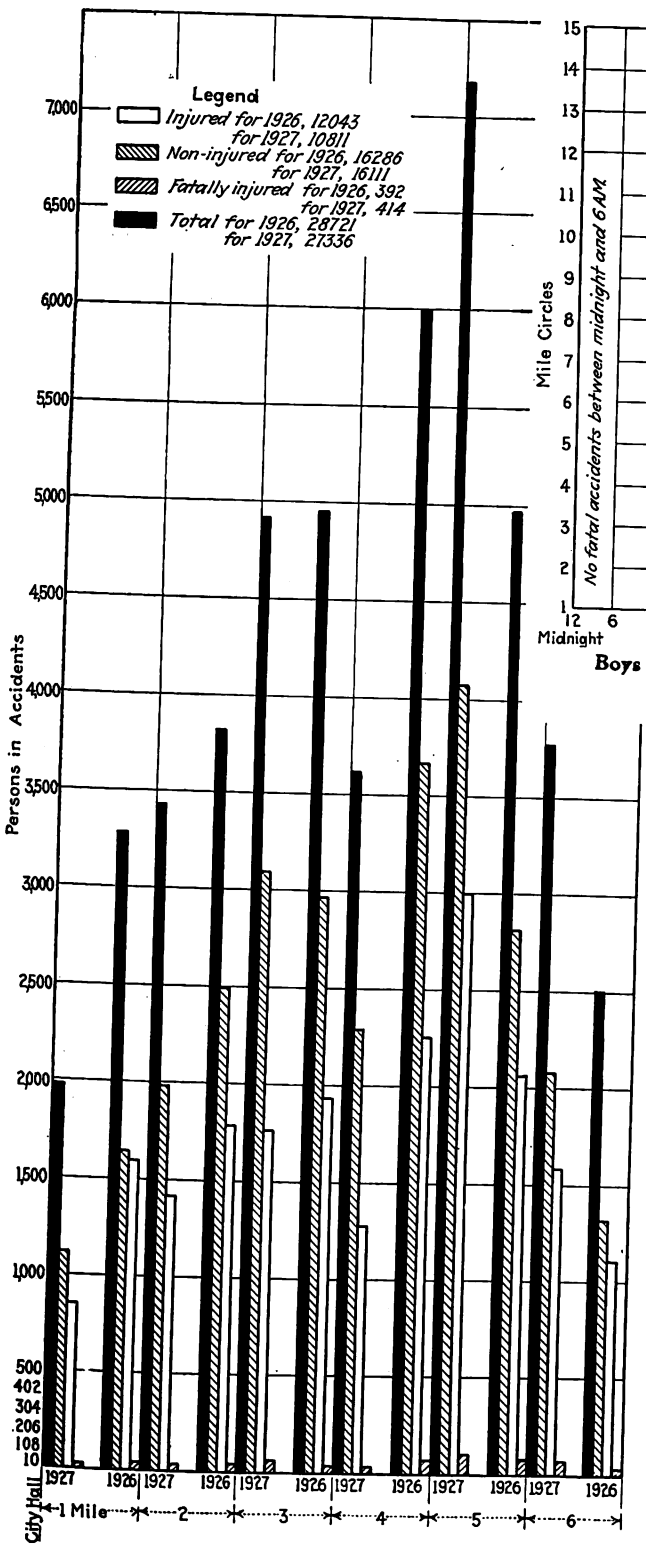
Making Detroit Safe from Accidents

CHARTS prepared from accident data of the Police Department of Detroit have been circulated among interested groups for the purpose of enlightening the public as to the causes of accidents and how to avoid them. The Police Department maintains accurate records of all accidents that occur, and summarizes this information each month and each year. One of the recommendations in the recent Detroit traffic survey, conducted by H. M. Gould, was to put to use these data to reduce the number of accidents in the city. This recommendation has been followed out and accident information has been broadcast by means of charts and articles, presented through various mediums.

Newspapers have taken an active part in the movement by publishing articles concerning the findings. Other publications, as the *Detroiter* and *Trucking News*, also have published articles from time to time on the subject.



Boys and girls fatally injured for the year 1927 and the hour of the day when the accidents occurred



Number of persons killed, injured and non-injured in six zones, during the years 1926 and 1927

The accident bureau prepares bar graphs which are sent out to all interested persons and organizations, such as police departments, safety bureaus, insurance companies, automobile clubs, civic groups, etc. The bar graphs, one of which is shown in an accompanying illustration, show the number of persons injured, non-injured and killed for yearly periods, in mile circles. By segregating the accidents by mile circles, it is possible to trace the districts in which the greatest danger exists. Comparison of the figures for any one zone and for two successive years shows whether any improvement has been made in that zone.

Other forms of charts have been helpful in bringing before certain groups the information that interests them alone. For example, a chart was prepared showing the children fatally injured for the year 1927, over a twenty-four-hour period. This chart, shown in another illustration, not only segregates the boys and girls, but also indicates the time of day when each accident happened.

Bulletins also have been prepared and distributed for individual groups. One of these gives the number of children of school age killed in traffic accidents for the years 1921 to 1927, inclusive, their ages, and the number of blocks from school at which each accident occurred.

It has been suggested that the city of Detroit be divided into six districts, each to be presided over by a traffic supervisor to study and investigate all traffic details and accidents. This would make possible a still further analysis of the causes and would contribute considerably toward reducing the number of accidents in the city.

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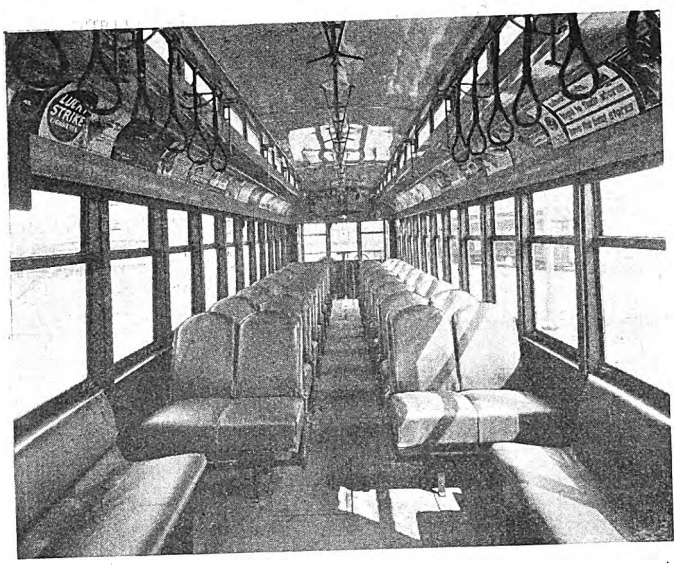


Interior of a reconditioned Capital Traction Company car. Individual leather seats have been installed

New Comforts for Washington Car Riders

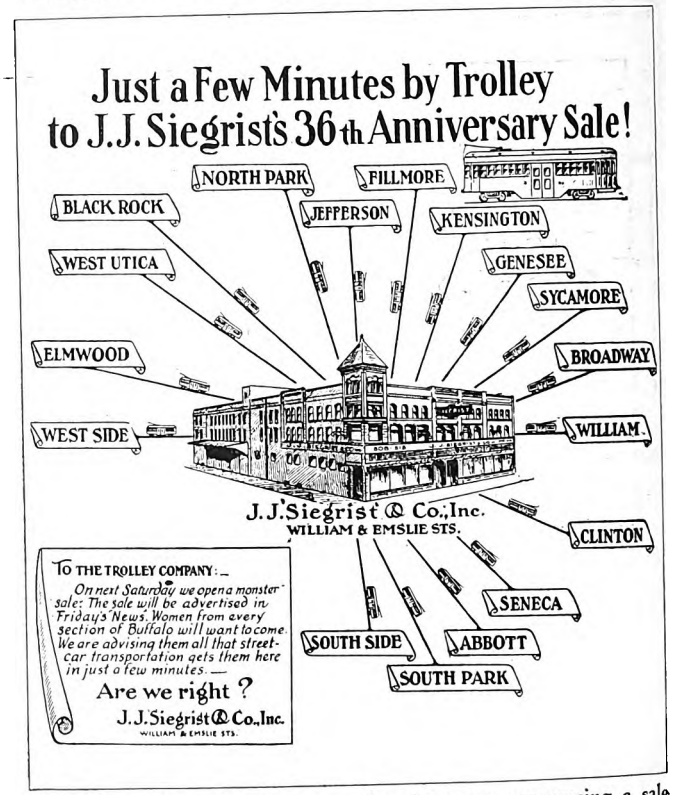
SEVERAL of the latest cars operated by the Capital Traction Company, Washington, D. C., have been reconditioned recently. Attractive features added include a new color scheme and new leather seats. The old color scheme of the company was solid green outside. The new one is a combination of gray and green with a line or two of red to give a warmer touch.

The cars reconditioned are of the double-end pay-within type, 44 ft. over bumpers and with a seating capacity of 48. The motors are equipped with helical gears and pinions. Flexolith floors were put in to deaden the noises of the trucks and to make the interior more attractive. This floor can be cleaned more easily than that previously used. New seats are of a design worked out by the company's engineers. They are reversible and are upholstered in green leather. Cushions are soft and there is ramp enough to the backs to make the seats very comfortable.

Inside, from the floor to the top of the windows, the woodwork is finished in walnut, and from there to the ceiling a light shade of gray is used. The ceiling is ivory. The whole appearance when the car is lighted at night is unusually pleasing. The reconditioned cars have attracted much attention on the street and public comments received by the company have been favorable regarding both appearance and seating arrangements.

Merchants Boost Street Cars

REALTORS as well as merchants in Buffalo, N. Y., are beginning to take cognizance of the very essential part the local transportation facilities play in the direct development of their own businesses. The newspaper advertising which has appeared recently rather indicates a conscious effort on the part of business men to capitalize

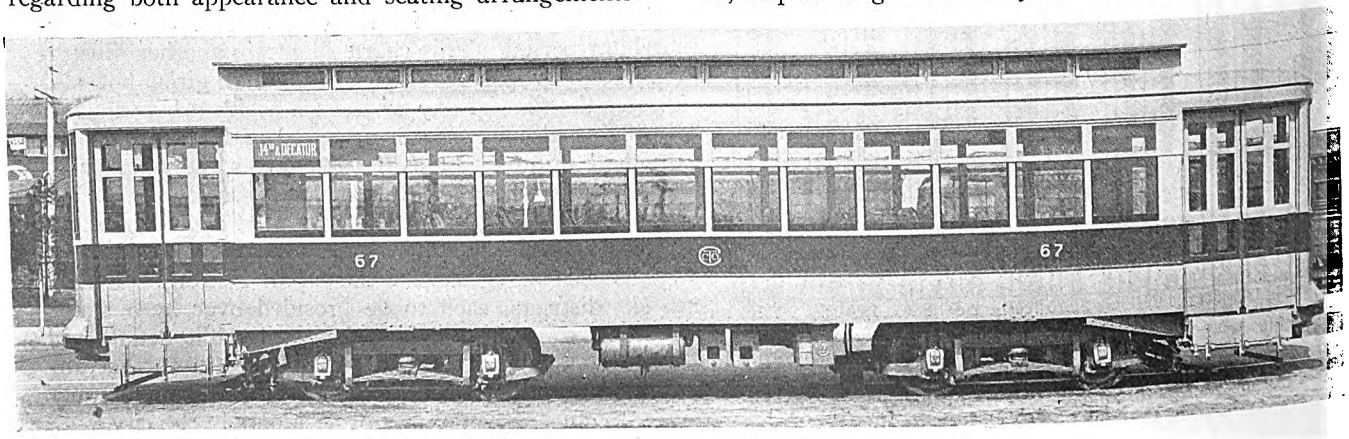


One of a series of newspaper advertisements announcing a sale by a large Buffalo department store, and in which traveling to the store by trolley was encouraged

the availability of street car service being provided by the International Railway for its prospective customers.

Typical of this advertising is a series of ads carried by J. J. Siegrist & Company, announcing a large anniversary sale in its department store. Two of the ads in this series are shown in accompanying illustrations.

The advertising of special occasions, like the department store sale referred to, is supplemented by advertisements of realtors, which appear throughout the year. Most of the advertising is used to promote new suburban districts and among the advantages listed for establishing homes in these districts is named accessibility. A typical ad, emphasizing accessibility, is reproduced.



One of the repainted cars. Outside colors are gray and green

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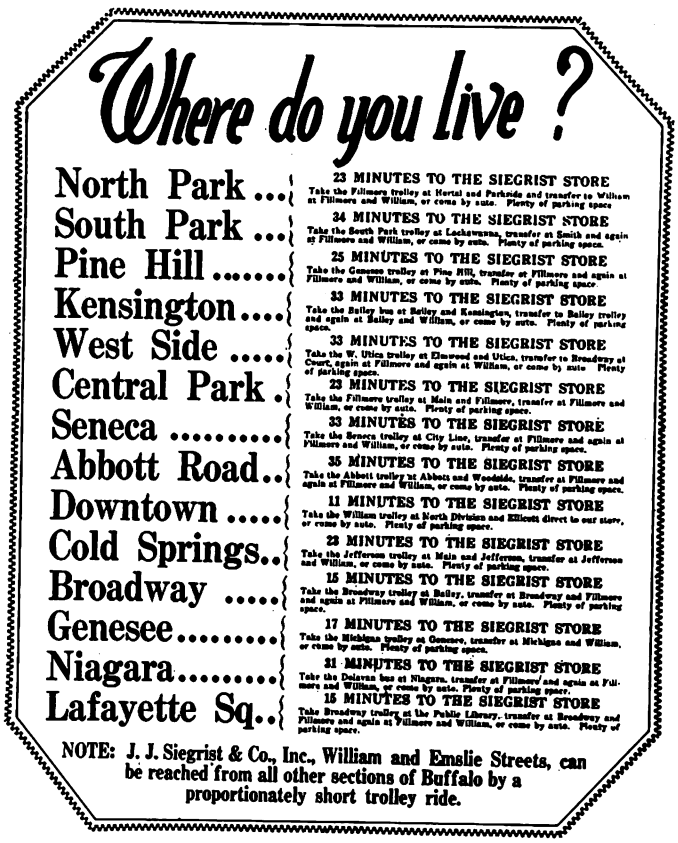
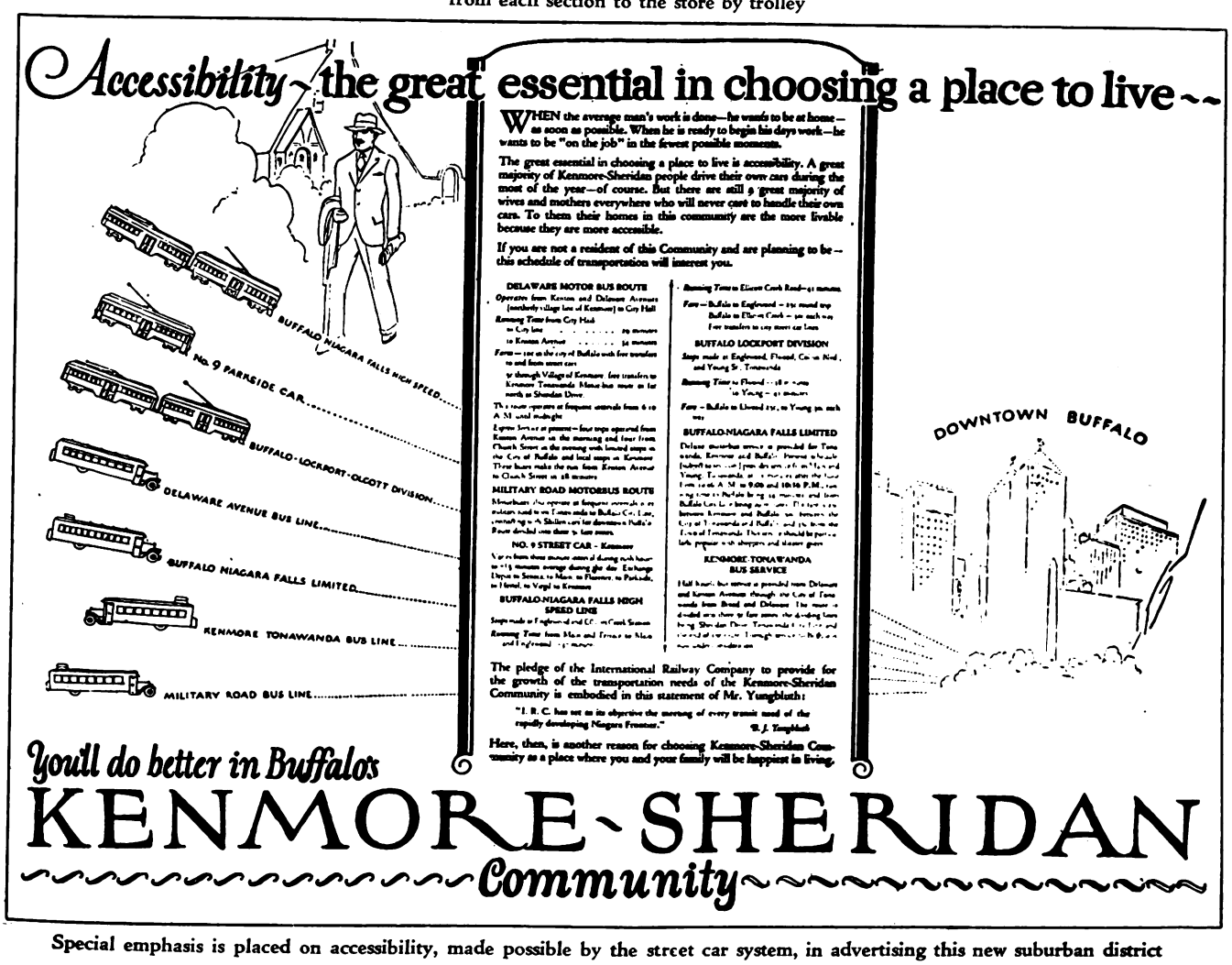


In this ad J. J. Siegrist & Company listed the various sections of Buffalo and the time required to travel from each section to the store by trolley



Special emphasis is placed on accessibility, made possible by the street car system, in advertising this new suburban district

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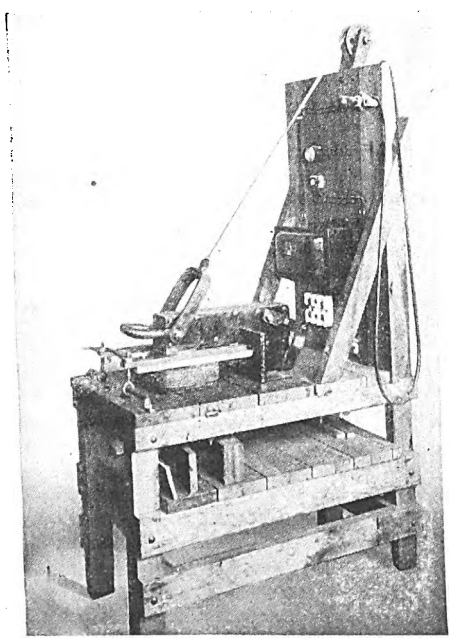
Maintenance Ideas That Save LABOR,

Testing Field Coils

By R. S. Beers
Railway Engineering Department
General Electric Company,
Schenectady, N. Y.

EVERY operating man is well aware that a poor field in a motor distorts the flux through the armature and is a source of commutation troubles and armature break-downs. Realizing this, some kind of a test is made of the field coils whenever an armature is changed or when the motors are overhauled. Various tests are used for determining whether every turn in a field coil is active. Probably the most common is a resistance measurement, either with a voltmeter and ammeter, a Wheatstone bridge, or a Century tester. The most effective method, however, is to use a transformer. The advantage of the transformer method is two-fold. First, it is a very simple test without the necessity of laboratory accuracy in measurements that is present with the resistance method. Further, it is feasible with this method to use a sufficient number of volts per turn so that incipient cases of failure will be detected, which the resistance measurement method will not do.

A "growler," or transformer, may be manufactured in the car shop at relatively small expense. It is necessary to obtain an ammeter, some knife switches, a small amount of double cotton-covered wire and sheet steel for the magnetic circuit. One that has been made by the Schenectady Railway and used by it with excellent success consists of a table with back and instruments as shown by the picture. On this are mounted a 60 amp. safety switch, fuses, a 30-amp. alternating current ammeter, and knife switches for short circuiting the ammeter and selecting the number of turns in the transformer winding. The transformer is made of No. 20 gage 0.0375 in. sheet steel. The cross-section of the iron is 4x5 in. or 20 square inches. The inside of the rectangle is 9½ in. vertically and 12 in. horizontally. The top horizontal member is hinged and counterweighted so that it may be moved up and down readily, providing a free space for putting a field coil in place for test and at the same time making it easy to close the iron circuit during the testing. The front vertical leg is flush with the surface of the table.



Field coil testing equipment as used by the Schenectady Railway.

Two or three sizes of removable pieces should be made for the portion of the iron circuit between the short vertical leg and the moving horizontal member. The largest should have the same cross-section as the remainder of the transformer. The others should be of less cross-section so that they will pass through the hole in the field coil. The largest that may be used should be selected. The winding is wrapped around the portion of the iron under the table. No. 10 B. & S. gage double, cotton-covered, wire was used.

The winding has 180 turns with taps, so that by means of knife switches either 60, 90 or 180 turns may be used. The regular testing should be made with the 90-turn winding. The 60-turn winding is useful in burning out a shorted turn quickly. While the 180-turn winding is useful when repairing a shorted coil, as it will indicate badly shorted turns with less heating than either the 60 or 90-turn winding, the final test should be made with the 90-turn winding. This winding is suitable for an alternating-current circuit of 100 to 120 volts, 60 cycles. With higher voltages, such as 220 or 440, a correspondingly greater number of turns should be used for the winding.

Obviously this tester is useless for field coils where more than one turn

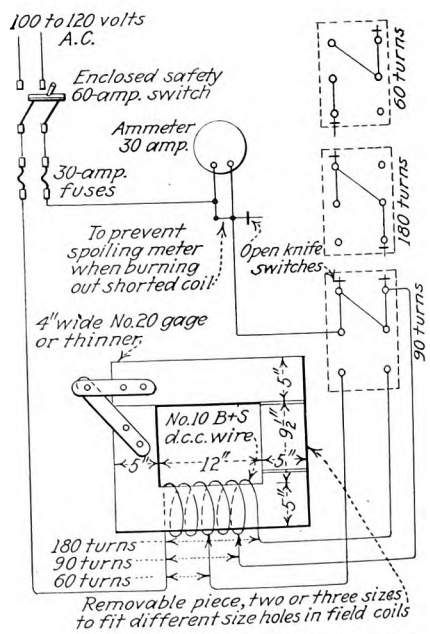


Diagram of connections for field coil tester

is fastened to the terminal or those wound on brass spools unless there is a saw slot through the spool, as otherwise these act exactly like shorted turns. In order to approximate actual conditions it is desirable that pressure be applied to the field coil when it is tested. If this is not done, coils with poor insulation may show clear under test and give trouble from shorts when installed in the motor case. The picture shows the clamping device used on this tester. A scheme using a lever would be fully as effective.

A field coil is tested by putting it on the table and closing the iron circuit of the transformer. Pressure is applied to the coil by means of the clamps and then by closing the safety switch the transformer is energized.

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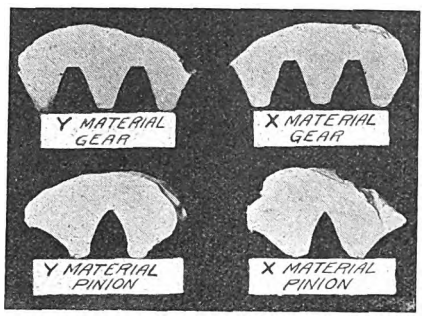
TIME and MONEY

Next, the knife switch connected across the ammeter should be opened. If the field coil has no shorted turns, the ammeter will show a current of exactly the same value as it does without a field coil on the transformer. This is known as the magnetizing current. If the field coil has any shorted turns the current will be greater. The degree of short is indicated by the ammeter reading. It is for this reason a switch short circuiting the ammeter is used because a badly shorted coil will show an ammeter reading in excess of 30 amp.

Visualizing Gear Wear

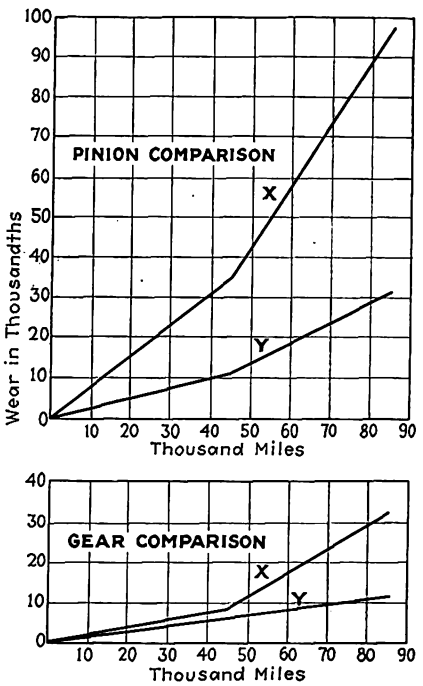
By E. S. Sawtelle
Assistant General Manager Tool Steel Gear & Pinion Company, Cincinnati, Ohio

ACCURATE comparisons of the quality of different grades of material in gears are difficult to make, and if made are rather difficult to interpret. Even when a limited number of gears are compared it is found there are always discrepancies between the wear of the individual cases, and the averages are the only method possible for making a fair expression. To one accustomed to using gear tooth micrometer calipers and dealing with the measurements of gear parts the figures are quite illuminating, but many a railway manager is not familiar with these and the mass of figures often convey little.



Plaster of paris cast to show wear on gears and pinions of different grades of material

A test was conducted recently on an electric railway system where four cars were equipped with different grades of gears on opposite motors and the readings were obtained with accurate micrometer measurements. These measurements were then plotted. The graphs show the average service obtained during the first period to be approximately 45,000 miles, and the average during the second period to be approximately 40,000 miles. They also show the relative life of two grades of gears, and give interesting light on the question as to whether gears wear better for the first half of their life than they do later on. The type of gear and pinion designated as *X* gave much less life than that designated as *Y;* also the type designated as *X* gave considerable less miles per thousandth of wear in the latter part of its life than in the early stages.



Graphs showing wear of gears and pinions of two different qualities

To visualize this test, plaster of paris casts were made of one gear and pinion which in wear was about typical of the average. These casts were then sawed into thin sections, mounted and photographed. The dark space shown in the accompanying illustration represents the gear teeth, one of which was beginning to wear quite decidedly. One of the pinions was worn to a knife edge.

Plaster casts are made by cleaning off the gear tooth, oiling it a trifle, and then pouring on wet plaster of paris. After about one hour it sets sufficiently to be removed, and if taken off carefully gives an exact reproduction of the gear tooth.

Wanted: Suggestions for Improved Shop and Maintenance Equipment

AT ITS MEETING in Cleveland the new executive committee of the American Electric Railway Engineering Association called attention to the widespread need for better machines and equipment for the maintenance of cars, buses, track and line. It was suggested that this situation be called to the attention of manufacturers through action by the maintenance men of the industry in pointing out what new devices are needed and improvements that should be made in available maintenance equipment.

Electric Railway Journal is glad to co-operate in carrying out this suggestion of the executive committee. It offers its pages as a clearing house of ideas for the improvement of maintenance facilities. By co-operation on the part of operating men themselves the limitation in shop and maintenance equipment can be brought forcibly to the attention of interested manufacturers.

Here is a challenge to operating executives of the industry. Electric railway shop equipment is notoriously deficient in comparison with modern production facilities in other industries. What improvements are needed most? Send in your suggestions. They will be published in this department in the hope of stimulating other operating men to enter this discussion of the need for better maintenance equipment. Letters are requested from anyone who has a suggestion to make regarding needed improvements in existing equipment or new devices that should be brought out.

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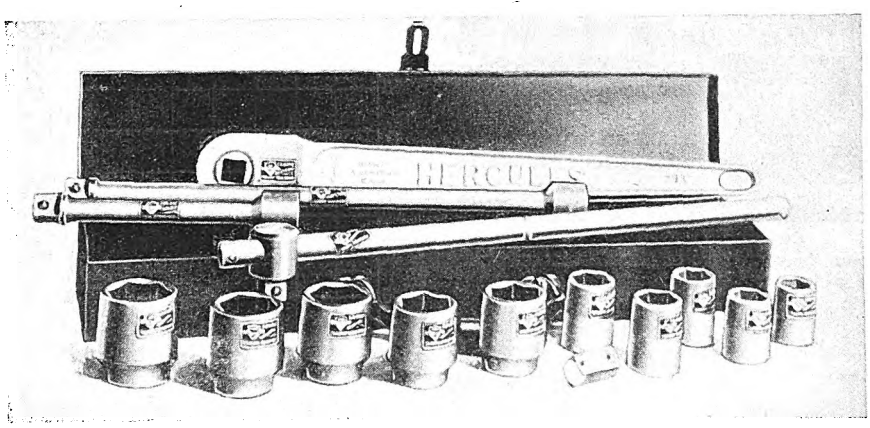
What's New in Maintenance Tools

Heavy Duty Set of Socket Wrenches

TEN chrome vanadium steel sockets ranging in size from a $\frac{15}{16}$-in. to $1\frac{5}{8}$-in. opening are included in a socket wrench set now listed by the Bonney Forge & Tool Works, Allentown, Pa. The set is designed for extremely hard service, and is proportioned so that although light in weight it has a very heavy reserve strength factor. The set includes ten sockets, a ratchet handle, and a short and long extension sliding T-handle.



Set of chrome vanadium steel sockets

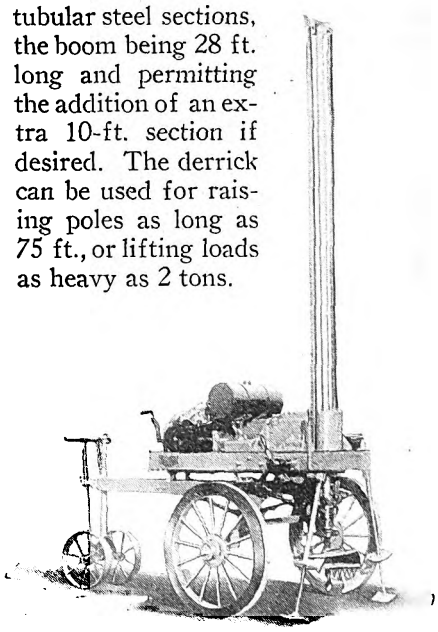
Improved Earth Drills

SUBSTANTIAL economies are effected, it is claimed, in digging holes for pole setting and other similar purposes with the Buda-Hubron earth drill, manufactured by the Buda Company, Harvey, Ill. This improved machine is rigidly constructed to resist the shock delivered by the engine, the rating of which is larger than that formerly used. Large clutches carried on spline shafts and operated by ball-bearing throwouts are provided.

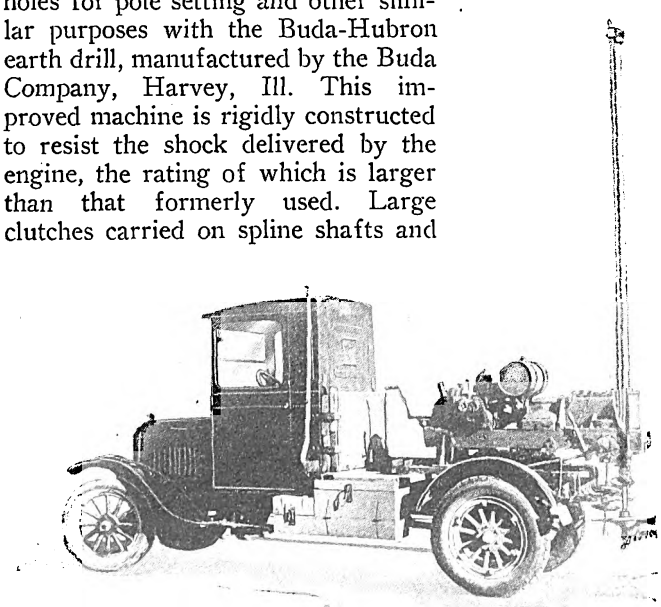
An improved type of lifting mechanism is used, two roller chains being provided for lifting the earth from the hole. A chain is located on each side of the spindle, and is suspended between springs, so that each carries its share of the load. The advantage in the use of chains is that no mud or dirt can lodge in them to cause excessive wear. Holes as large as 24 in. in diameter can be drilled to a depth of 10 ft. Drills $1\frac{3}{4}$ in. in diameter can be supplied for drilling blast holes in rock.

These drills are available in three different models, the trailer type, the truck type and the tractor type. Both the trailer type and the truck type are self-contained units, being powered by a two-cylinder, opposed-type, air-cooled, four-cycle engine, provided with force-feed lubrication.

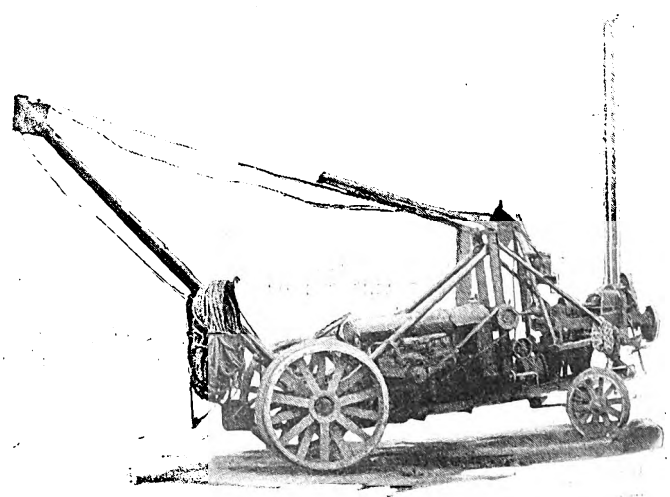
The tractor type consists of a tractor with an extended frame on which the drilling mechanism is mounted. The wheelbase is 108 in., and wheels with solid rubber tires and rims are provided, so that the machine will travel on cross-country right-of-way, as well as on highways. Power is furnished by means of a belt to the drill mounted on the front end. A pole-raising winch is mounted on the front of the tractor directly behind the drilling mechanism, power being used both for raising and lowering the load. The derrick, which is mounted over the rear axle of the tractor, is made of tubular steel sections, the boom being 28 ft. long and permitting the addition of an extra 10-ft. section if desired. The derrick can be used for raising poles as long as 75 ft., or lifting loads as heavy as 2 tons.



Trailer type of Buda-Hubron earth drill



Earth drill arranged for mounting on the platform of any standard auto truck



Drill mounted on a tractor with winch and derrick for setting poles

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Association Activities

New Englanders Discuss Making Transportation Salable

Means of increasing attractiveness of cars and buses theme of Portland meeting. Purchase of new rolling stock urged by President Slade in his address

PESSIMISTS in electric railway economics found few sympathizers at Portland, Me., on Thursday, Oct. 18, when the New England Street Railway Club journeyed to the metropolis of the Pine Tree State to meet and discuss ways and means of making transportation salable through improvements in car and bus design. President Walter C. Slade occupied the chair, and in accordance with the current plan of holding regional meetings Past-President Fred D. Gordon arranged the program. A total attendance of 105 was recorded.

At the afternoon session two papers were presented: "Modern Cars," by R. T. Foster, superintendent Wason Manufacturing Company, Springfield, Mass., and "Better Service and Maintenance Make Bus Transportation More Salable," by John H. Walsh, superintendent rolling stock and shops Middlesex & Boston Street Railway, Waltham, Mass.

At the club dinner held in the evening President Slade spoke briefly on rolling stock developments and the need for placing more orders with manufacturers. Toastmaster Fred D. Gordon then called on Hon. Charles E. Gurney, chairman Maine Public Utilities Commission, and Hon. George L. Emery of the Maine bench, who addressed the assemblage on public relations and current problems of the transportation industry. The tone of the entire meeting was filled with vigorous optimism, and when adjournment came many expressions of satisfaction were heard that the club's major theme at the next meeting to be held would be transportation merchandising, with its various aspects.

Modernization of Equipment All-Important

In his paper on the use of modern cars, R. T. Foster stressed the importance of modernizing all equipment to meet present-day competition. He pointed out the advantages of purchasing up-to-date cars and cited examples of railways that had become profitable and secured the good will of their public by obtaining new cars and offering better service. An abstract of Mr. Foster's paper will appear in a subsequent issue of the JOURNAL.

"By increasing speed and enhancing comfort of riding," said J. C. Thirlwall of the General Electric Company, in discussing Mr. Foster's paper, "much can be done to build gross revenue. Modernization of rolling stock is one of the most important means of attacking this problem.

At Pittsburgh the use of new cars for three weeks showed a 14 per cent increase in gross revenue and reduced operating costs. The use of new, light-weight cars, with upholstered seats, at Attleboro, Mass., has been instrumental in increasing patronage and turning red figures into black. The revenue in that city for the year ended Aug. 31, 1928, was $215,754 compared with $173,700 for the previous year. In two months the net revenue showed a loss of $1,400 with old cars but the corresponding two months, a year later, showed a balance of $5,700 with new car service, or a total gain of $7,100."

Better Service and Better Maintenance Necessary

"To make our transportation salable," stated John H. Walsh, in his paper on buses, "we must be everlastingly on the alert to take advantage of each and every opportunity to improve our service and better our product. Only after making our service reliable and comfortable can we hope to educate our patrons who own automobiles to use our service more frequently." Mr. Walsh spoke of the advances made in bus design and pointed out the necessity of properly maintaining equipment. He dwelt at some length on inspection methods and the use of lacquer. An abstract of his paper will appear in a later issue.

G. E. Pellissier, superintendent of equipment Holyoke Street Railway, expressed the need of careful study by the industry of the specific field of service of buses and cars, and said that comparisons should be made between modernized cars and modern buses rather than between old cars and new buses.

Purchase of Cars Urged

President Slade opened the evening meeting by summarizing the afternoon proceedings and commenting upon their significance in relation to rolling stock developments. He pointed out the need of modernizing methods of management, operation and property to make the transportation product salable, and spoke of the rapid development of automotive equipment, compared with the development of electric railway equipment in the same period. He referred to the development of the new light-weight cars and particularly urged that operators encourage the car manufacturers with a few purchases of equipment at the present time.

After a short entertainment, Toastmaster Gordon called upon Chairman Gurney of the Maine Commission, who spoke sympathetically of the problems of the industry as viewed by the commission. Mr. Gurney pointed out that if the public prefers to ride by private automobile, the transportation companies are not required by law to furnish a non-paying volume of service, but that the proper service must be determined by careful testing and no uncertain judgments reached. The speaker suggested that the institution of a 5-cent fare for a limited congested area in the heart of city districts might be a traffic stimulator for the railways. Turning to public relations matters be reviewed the work of the commission in relation to the regulation of the utility security

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Oct. 29-31*—American Institute of Electrical Engineers, first regional meeting of the Southern District, Atlanta, Ga.**

***Nov. 8-9*—Iowa Electric Railway Association, operating meeting, Roosevelt Hotel, Cedar Rapids, Iowa.**

***Nov. 13-16*—National Association of Railroad and Utilities Commissioners, New Orleans, La.**

***Nov. 21-22*—Public Utilities Association of Virginia, Hotel Roanoke, Roanoke, Va.**

***Nov. 21-22*—Central Electric Traffic Association meeting, Auditorium Hotel, Cleveland, Ohio.**

***Dec. 3*—National Highway Traffic Association, South Central Division, New Orleans, La.**

***Dec. 10*—National Highway Traffic Association, annual meeting, Automobile Club of America, New York, N. Y.**

***Jan. 14-18, 1929*—American Road Builders' Association, convention and road show, Cleveland, Ohio.**

***Jan. 23-25, 1929*—Electric Railway Association of Equipment Men, Southern Properties, Houston, Tex.**

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issues, and stated that in the past seven years these have totaled $119,000,000 in the state without a single default or objection from the investment standpoint. The confidence of the public in the commission is high, and the commission's finding that the books of an operating company are honestly kept suffices.

JUDGE EMERY COUNSELS PATIENCE

In a whimsical speech based on long study of human nature in history and in modern life, Judge Emery declared that the American public is today on a kind of economic "spree," the outcome of which must in time be a resort to less costly means of living. He maintained that the private automobile cannot be looked upon as other than a luxury, and that if the modern transportation company guides its affairs ably and with a keen sense of how to appeal to the public with its service, better days will come. The advent of air travel is likely to prolong extravagant habits, however. Patience with the lack of mass understanding of public utility problems will be rewarded. Popular indifference can be overcome by frank treatment, good service and modern managerial methods. In due time the three great branches of American industry—agriculture, manufacturing and transportation—will reap their proper rewards. Meanwhile the railways must seek profitably to stay in the game, make themselves worthy competitors of the new outlets for human expenditure and trust in the ultimate return of the public to economic sanity and common sense, which will usher in a new and better era.

To Discuss Shipping on Skid Platforms

On Thursday, Dec. 6, at 2 p. m. there will be held a special session of the annual meeting of the American Society of Mechanical Engineers at the Engineers Building, 29 West 39th Street, New York City. Six papers have been prepared, treating from different angles the problem of shipping materials on skid platforms. Mechanical methods of handling, common in plants throughout the country, have recently entered the distribution field and the Department of Commerce has sponsored a movement to standardize equipment and provide interchangeability in use. The keynote paper will be delivered by Mr. R. L. Lockwood, of the Department of Commerce, who will trace the development of shipping material on skid platforms, outline the possibilities for growth and explain the importance of interchangeability in the equipment. Other speakers will be as follows:

J. V. Miller, assistant general storekeeper, Chicago, Milwaukee, St. Paul & Pacific Railroad, "The application of skid shipment to the stores department of a large railroad and the economies obtained"; George B. Wright, freight traffic manager, Detroit & Cleveland Navigation Company; "Material handling by an inland waterway transportation company"; C. B. Crockett, industrial truck department, The Society for Electrical Development, Inc., "Economic aspects of skid shipment from the standpoint of the user"; F. J. Sheperd, Jr., treasurer, Lewis-Sheperd Company, "The part played by the manufacturer of trucks and skids in the adoption of interchangeable equipment," and F. E. Stocker, resident manager, McCormick Steamship Company, "The application of skid shipment in the field of ocean transportation."

One-Man Car Operation from a Safety Viewpoint*

BY D. A. SCANLON
General Superintendent of Railways
Northern Ohio Power & Light Company, Akron, Ohio

DURING the past five or six years most railways have established one-man car service to some extent. In a few of the larger cities the cars of this type are operated only in sparsely settled districts, where few passengers are carried and traffic is not congested; however, this car is proving its efficiency to such an extent as to justify its exclusive use in some urban centers. Not only has it proved successful in urban service, but it is now being used exclusively on some interurban lines with a marked degree of satisfaction. Examples of such operation are the lines from Buffalo, N. Y., to Erie, Pa.; from Alliance to Canton, Ohio; from Akron to Wadsworth, Ohio; and from Canton to Massillon, Ohio. The last-mentioned line maintains a fifteen-minute schedule during an eighteen-hour day and operates at high speed. Automatic spacing signals are used, and during the three-year period this line has been operated with one-man cars, we have not experienced even the slightest car collision. In fact, accidents of all types have been fewer than when two-man cars were operated. The Stark Electric Railway, operating from Alliance to Canton, Ohio, reports a similar experience since changing to one-man operation.

The Pittsburgh Railways started to operate one-man cars in 1926 and has since steadily increased this service and, according to its report, experienced a slight increase in the number of accidents per 10,000 miles operated as compared to two-man operation; however, it is also stated the company experiences fewer serious accidents with the one-man cars than with the two.

A very interesting report of successful operation of one-man cars was received from the Houston Electric Company, Houston, Tex., showing that the per cent of accidents per 10,000 revenue car-miles operated for the four-year period 1924 to 1927 had fallen from 6.33 per cent to 5.62 per cent on one-man cars and from 7.71 per cent to 6.96 per cent on two-man cars. The company further stated:

We are completely sold on the use of one-man cars on this property and our plans are for the elimination of two-man operation as soon as possible. It is our opinion that an operator on a one-man car is more apt to avoid accidents through being kept busy, than with two-man operation which does not require both men to be alert at all times.

The Kansas City Public Service Company, Kansas City, Mo., while not submitting comparative statistics, reports a very favorable experience in accident prevention since the adoption of one-man cars.

The Wisconsin Power & Light Company, Fond Du Lac, Wis., reports as follows:

It has been our experience in operating one-man cars to find that our accidents have been decreased; has made better operators of our men and has built up better relations with the public, due to the fact that all operators come in contact with the traveling public. Like other utilities, we have found a few minor objections to one-man operation, but on the other hand the advantages of operating them offset the disadvantages and are the winner by far.

The Gary Railways, Gary, Ind., reports as follows:

Since the latter half of 1927, our property has been 100 per cent one-man operation and our number of accidents and incidents for the first six months of 1928 have been reduced over the similar period of 1927, with approximately 60 per cent one-man operation, from 479 to 315 accidents.

It would hardly be fair to believe that this decrease is all due to one-man operation, as we have constantly endeavored to reduce accidents by the installation of safety devices, safety programs and rigid safety discipline of trainmen.

The important feature of one-man operation from a safety standpoint is that all one-man cars should be equipped with every known safety device. We know of no accidents on our property that can be attributed to the one-man operation of cars.

From the Virginia Electric & Power Company, Richmond, Va., where a mixed service is maintained, came a statement to the effect that during the year 1927 a total of 7,958,231 car-miles were operated, of which 71.19 per cent were by one-man cars, and that of the total number of accidents on the system approximately 69 per cent were on the one-man cars. In the city of Norfolk a total of 5,070,544 miles were operated of which 59 per cent were by one-man cars. Of the total number of accidents reported 56 per cent were on the one-man cars.

On the property I represent, we are

**Abstract of a paper presented at the Seventeenth Annual Safety Congress, held at New York, N. Y., Oct. 1-5, 1928.*

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operating one-man cars exclusively in three cities, namely, Akron, Canton and Massillon, and also on two suburban lines, serving an aggregate population of approximately 500,000, and, generally speaking, we have found such operation advantageous from every viewpoint, particularly in the reduction of the number and seriousness of our accidents.

Safety Devices Have Contributed

Since the advent of one-man cars many mechanical safety devices have appeared which have contributed to their safe operation. We have placed floodlights across the entire front ends of our equipment, as a result of which head-on collisions with other vehicles have been materially reduced. Ratchet gongs have been installed on all city type cars. This has proved an effective safety measure. All cars have been equipped with automatic treadle exit doors, which assists greatly in maintaining schedules; in fact, the treadle doors, which operate only when brakes are set and power off, have eliminated entirely the possibility of passengers falling from moving cars. With the two-man operation this class of accident presented serious possibilities.

Our door accidents are continually decreasing as the car operators and the riding public become more familiar with the operation. I cannot say we experienced an increase in accidents of this nature since operating one-man equipment, as door accidents were more or less frequent before that time. All cars are equipped with automatic power and brake control so that they cannot be moved while any doors remain open.

During the past two years our number of miles run per accident has risen from 1,785 to 2,920, while the number of passengers carried per accident has increased from 11,859 to 19,579. I do not credit this entirely to the one-man cars; a good deal is due to the intensive training the men have had in accident prevention. In conclusion, I am thoroughly convinced that one-man car operation is practical, economical, and a good business from a safety viewpoint.

Brady Contest Date Extended to Nov. 15

ARRANGEMENTS have been made to extend the closing date for the submission of entries in the Anthony N. Brady Safety Contest to Nov. 15. Many properties which have improved their accident record during the past year are thus given time, following the annual convention, to prepare information for submission in the contest. No elaborate brief is necessary. A complete statement of facts regarding actual success in increasing safety and in reducing accidents is all that is required. Full details may be obtained by application to the American Electric Railway Association. No further extensions of the closing date are possible and all entries must be made by Nov. 15.

Safe Bus Operation*

By R. W. Meade

President People's Motorbus Company, St. Louis, Mo.

WHEN, a little more than 21 years ago, the gasoline motor bus was introduced in New York as a new medium of public transportation, there was very active discussion among street railway men as to whether the street car accident record at that period would not be greatly outdone by the motor bus. Far from piling up a record of costly collisions with vehicles or pedestrians, accidents of a serious character were comparatively rare, and the pedestrian accidents were almost completely confined to cases of drunkenness or gross heedlessness on the part of the victim, who usually walked into the side of the bus after the front of the vehicle had passed. Our few fatalities were nearly all of that character. In the first ten years of operation during which our buses ran more than 25,000,000 miles and carried nearly 100,000,000 passengers there was but one fatal accident to a passenger and three cases of serious injury, while accidents involving persons other than passengers totaled 16 fatalities and 24 cases of serious injury. These results proved that, given proper organization and supervision in a city with adequate police traffic regulation, the motor bus makes a highly favorable showing from the point of view of safety, both of its passengers and of others.

Inasmuch as the experience gained and the methods pursued in New York have been largely followed in the organization and operation of bus service in other cities, an outline of some of the basic factors involved in the operation in this city may be of interest.

1. *Standard Rules*—In the very beginning the standard rules of the American Electric Railway Association for city street car operation were taken as the basis for the rules for the operation of motor buses. Thus the underlying principles that had been found valuable in street car operation were applied to the motor bus so far as practicable.

2. *Tried System of Discipline Employed*—In the enforcement of the rules, the methods developed in the steam and electric railway fields, under which a cumulative record of every man is kept and can be reviewed, were employed and have proved their value.

3. *Training and Promotion*—The practice of employing every man first as a conductor, where we have a chance to observe his general habits and reactions before he is permitted to drive a bus, with all the responsibility this entails, has been of the highest importance. We have always maintained a differential pay rate in favor of the driver, and this has proved a strong incentive to the man working on the rear end to give meritorious service and win promotion to the position of greater responsibility and remuneration. We have also found that the man who has served on the rear end when promoted to driver shows a greater sympathy with his team mate, and this makes for greater safety. Nothing is more important to safety than the character and thoroughness of the training the prospective driver receives. Only the best men can be safely entrusted with that important duty, and on the principles and practices absorbed by the new driver during this process his success in safe and economical handling of his vehicle will largely depend.

4. *Physical Examination of Crews*—The physical examination of men employed as drivers and conductors of motor buses is of the highest importance. While the term "physical" is employed, our examinations have always gone beyond the literal interpretation of that word, our physicians being particularly alert to eliminate men with mental or psychopathic tendencies that would render them unfit for this exacting service.

5. *Incentive to Longevity in Service*—Our experience shows that, in general, the longer a man remains in our service, the better he is, and this applies in the matter of safety as well as other characteristics of his work. Therefore it is not only simple justice but good policy from the economic viewpoint to increase his pay according to his length of service, and this has always been a feature of our policy.

6. *Mechanical Excellence of Equipment*—Nothing but the very best equipment obtainable, regardless of its cost, has ever been good enough for our use. Absolute safety can only be assured by using vehicles competently designed for the service they are intended to perform and built conscientiously of material capable of withstanding the arduous duty and heavy strains imposed in public service.

7. *Mechanical Inspection and Repair*—Possessed of equipment capable of withstanding the arduous service to which it is subjected, the next requisite is to keep it continuously in the best of condition. The system employed by the London General Omnibus Company and adopted by us has been aptly termed "mechanical prophylaxis"—in other words, anticipation and prevention of trouble instead of waiting for it to occur. This consists of a periodical inspection and overhaul of every vehicle based on the performance of a certain mileage, varying from 2,000 miles up,

**Abstract of a paper presented at the Seventeenth Annual Safety Congress, held at New York, N. Y., Oct. 1-5, 1928.*

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and regardless of the vehicle's apparent condition at the time. In addition to the foregoing, every vehicle is subjected to an annual overhaul, equivalent to a rebuilding, during which every element in it is brought up to the latest standard.

8. *Means to Prevent Skidding*—Slippery pavements and skidding accidents are two of the worst dangers of bus operation, and this refers not only to the bus itself but to all other vehicles on the street. After providing vehicles that by excellence of design are reasonably free from skidding tendencies, careful training of drivers in methods of handling their vehicles on slippery pavements is the first requisite. The third line of defense is to so treat the pavement at critical points as to minimize the skidding of any vehicle.

9. *Safety Organizations*—It is necessary to keep the idea of safety prominently and constantly before the entire organization and to secure the co-operation of the rank and file in maintaining it if accidents are to be kept down to a minimum. For this purpose a wide variety of expedients may be employed in the form of financial bonuses, prizes, contests, etc., but the basis for any of them and the most effective, year in and year out, is some form of safety organization. This can vary widely in its make up and functions so long as it provides for the free and active participation with the supervisory and executive forces of the rank and file, that being the essential characteristic without which it would not differ materially from or properly supplement the operating organization.

10. *Records and Statistics*—It is of course important to keep complete records of accidents and to classify them, the most important objective of such records and statistics being to diagnose the direct and underlying causes, and thereby be able to apply preventive remedies. I have often felt that the ability to make readily at any time such special classifications as are only possible by means of some selective mechanical system would be exceedingly helpful in this direction, and on a large system might easily repay the rather high expense involved.

Bus Operation from a Railway Man's Point of View*

By Arthur T. Warner
General Manager in Charge of Traffic
Public Service Co-ordinated Transport, Newark, N. J.

IT HAS taken between ten and fifteen years to turn the local transportation agencies to a point where they are ready to accept the bus and bus operation as part of their job. Since 1923 or 1924 this change has been under way very rapidly and we find now that practically all of the larger local transportation agencies are giving at least a portion of their service with buses.

I have been advised that I should dwell upon the safety element in bus operation. I hardly need to say that operation, to anybody raised in the railway business, is always safe operation. With us safety has been the first element of service. Every railway slogan has had safety in it somewhere. Safety always; safety first; safety, service and efficiency; safety, courtesy and loyalty. There are dozens and dozens of them, but safety appears in each. So when we started to consider the bus as a vehicle with which to carry our patrons, as a means by which we could furnish a service such as we were accustomed to give with our trolley cars, we looked at the high, light, single tire, often brakeless, vehicles and wondered what elements of safety they contained—and we set about to develop what in the first place was a safer vehicle.

I will not go into a long technical discussion describing the various stages in the development of the bus of ten years ago to the vehicle of today. Let it be sufficient to say that the modern bus is a safer, more comfortable and more dependable vehicle from all points of view. Chassis have been lowered, which has brought down the center of gravity; we find dual wheels on the rear, which has done away with skidding; four-wheel air brakes are now in order; buses are now well lighted; good ventilation exists; all of which, in brief, gives the patrons a ride which will compare favorably indeed with that in an expensive limousine.

Gas-Electric Drive Permits Safer Operation

My own company is one of those which is strongly in favor of the gas-electric drive, which by the elimination of the transmission and all gear shifting has, we believe, additional safety features. The operator's hands, being free from gear shifting, are just that much more available for other duties. The lack of gear shifting also gives freer acceleration, eliminates the jerking of the passengers, which comes from sudden gear shifting and consequently gives a safer and more comfortable ride.

Of course, all my observations are based largely upon my own experiences in New Jersey. Five years ago today we had less than a dozen buses running on two short country lines. Today we have over 1,700 buses which will operate over 55,000,000 bus-miles this year and carry over 325,000,000 passengers. So you can see we have certainly opened our arms to the bus as a means of modern transportation within the last five years, and today the system in London is the only one in the world that surpasses ours in size.

We have found in the development of an operating personnel, that the same intensive methods of training are necessary with bus operators that we have always used with our car platform men, except that, as a rule, a would-be bus operator comes to us with a driver's license and some bad habits of driving, which he must unlearn before he can become a first-class bus operator. Our schools of instruction are flooded with ex-truck drivers and ex-taxicab men and we find that our first duties are to make these men overcome bad habits that they have acquired in the earlier employment. This is something we never had to do with the trolley operator.

Cars and Buses Co-ordinated Wherever Possible

I want to digress from the strict discussion of safety to give you a brief picture of the different ways in which we are using buses in New Jersey at this moment. In our larger communities such as Newark, Jersey City, etc., the trolley system is still carrying the backbone of our mass transportation. We have inherited sizable bus operations that parallel these car lines and we use this bus service co-ordinated with the car service in such places. We are rerouting these bus lines to adjacent parallel thoroughfares so that there will not be a duplication of service on the same street and the bus will be placed on a highway not occupied by car tracks, so that it may develop to some extent a territory of its own.

In other municipalities, such as Paterson, Plainfield, New Brunswick, etc., we have discontinued our street car service and replaced it with bus service. These have been on lines of comparatively light traffic, where street car operation was over single track with turnouts and where the flexibility of bus operation has been developed to its fullest extent. We have installed new bus lines as feeders, crosstown routes, extensions into new developments and to open up new territory.

We have also placed in operation a considerable number of so-called "de luxe" bus lines. We call them "Super Service" lines. These are vehicles specially designed for greater comfort and interior attractiveness. They differ from the regular bus in the same way that the parlor car differs from a day coach. There are individual seats, well upholstered, and extremely comfortable; there are curtains in the windows, mirrors in the panels and interior finish of a pleasing design. These vehicles furnish the patron as comfortable a ride as in his own limousine. We charge a higher fare for this service and it is furnished on a basis of a seat for every passenger. Routes such as these, chosen so as to serve neighborhoods that would naturally patronize more expensive and higher class service, are developing rapidly in our ter-

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ritory and give evidence of having great future possibilities. This is a field for the bus that the street car never had.

I have just cited a few of these cases to show that the bus has and is creating more and more a distinct appeal of its own with the traveling public. There are small elements in bus service that the trolley cannot give, that the steam road cannot give, and if the local transportation agencies are to meet the competition which the privately owned automobile is giving today, they must go to the buses, because the bus gives the service which more nearly approaches that of the private car.

The bus has now reached the point where it must be and is accepted as a part of the transportation industry. The vehicle is being developed rapidly. It is being continually improved in design to give a greater safety, greater comfort and a wider range to its use. Its adoption by so many transportation agencies has led to the use of modern operating methods, of operating forces trained for their work, and continually under the eye of executives who have been brought up with safety as their watchword.

I would, however, be lax indeed, if I allowed this occasion to pass without an appeal for the greater co-operation in our safety campaigns from those who have, after all, the greatest power to produce safety results. All our states, all our larger municipalities, all governmental agencies that exist, have passed and now have in force, laws, ordinances and regulations governing the use of highways in the interest of safety. These laws should be uniformly enforced. I refer not only to speed regulations but to parking ordinances, jay-walking, the elimination of left-hand turns, in fact every kind of so-called traffic rule. The work of the Hoover conference has been a great step in bringing about a uniform system of traffic control and regulation. We in New Jersey are now enjoying the first fruits of this conference. Our legislature within the last three months has passed a uniform traffic act. We have, we feel, enough laws and regulations and the thing remaining for us to do, is to enforce, uniformly, justly and fully the laws we now have so that the bus, the car and private automobile may each use the public highways so that each may travel with safety.

Housekeeping for Substations and Storehouses*

By H. B. Harmer

Safety Engineer Philadelphia Electric Company, Philadelphia, Pa.

HOUSEKEEPING for power houses, substations, storehouses and utility properties in general, embraces many varied elements that cover a surprisingly large field of activities. The importance of this subject cannot be too strongly emphasized. Good housekeeping is fundamental to maintaining continuity of service and is essential to successful and economic operation of utility properties.

There are two outstanding features of good housekeeping—orderliness and cleanliness. These are never accidental but are the results of planning, system and supervision. Then comes the most important element—inspection. Intelligent, earnest study of inspection methods plus hard conscientious work by every person in the organization is necessary to secure the best results. A system of inspections should be started and maintained.

Buildings, grounds and outdoor structures require constant supervision to maintain them in a proper state of repair and in satisfactory condition. Without this constant supervision unhealthy conditions of the physical properties will arise. Prolonged neglect will surely result in such dilapidation as to require replacements in many cases when comparatively simple and inexpensive repairs made at the proper time might have prevented deterioration. Both the inside and outside of building structures should be rigidly inspected and any defect, no matter how small, should be given immediate attention.

The careless and untidy storing of materials in storerooms and plants may occasion both fire and accident hazards. Often when a shipment of material arrives the cases are opened and allowed to remain unpacked for several days, and the excelsior, sawdust or paper packing constitutes a very serious fire hazard. Special care should be exercised that material piled near aisles and passageways is not likely to fall, or to be knocked over; the piles should not be too high; neither should parts extend into the passage or roadway where passing men or trucks may strike against them.

Avoiding Fire Hazards

Proper provision should be made for the storing and handling of miscellaneous oils, paints, etc., and when small quantities are withdrawn for use, any portion left over from the day's supply should be returned to storage. The practice of storing materials in operating rooms of power houses, substations, etc., constitutes a serious fire hazard and should not be permitted.

The lighting and ventilation systems should be maintained in good operating condition. A well designed artificial lighting layout is an essential upon which too much stress cannot be laid and this applies equally as well to ventilating by natural or artificial means. Poor ventilation and bad lighting result in physical and mental reactions which are detrimental to service and cause diminution of alertness.

Cleanliness Given Too Little Attention

The desirability of cleanliness in and about stations and buildings is so unquestionable that no particular argument need be advanced in support of it, but even so it frequently happens that too little attention is given to attain this end. The necessary cleaning supplies such as tools, brooms, dust pans, mops, mop pails, sponges, etc., should be furnished unstintingly. In the larger stations it has become recognized as economy to install modern labor saving appliances for the use of the clean-up crew. Having provided the necessary equipment and clearly defined the standards of cleanliness in and about the buildings, steps should be taken to see that the established standards are maintained.

It is sometimes difficult to prevent accumulations of litter and dirt, particularly in basements, at the bottom of elevator shafts, under piles of materials and other out-of-the-way places. Such conditions, however, can be prevented if proper measures are taken. Extreme care should be given the storage of rubbish and useless material, and prompt removal from premises should be the rule. Wooden boxes should never be used for temporary disposition of these materials.

Greasy and oily waste is subject to spontaneous ignition and the greatest care should be taken in its disposition. Unless it is immediately burned after use, waste should be deposited in standard metal waste cans. The construction of the waste can is of vital importance, and non-standard cans are of but little value. The old-style wooden closets, lockers and enclosures are sometimes used as a catch-all for discarded and greasy garments, all of which increases the fire hazard. Substantially constructed and properly ventilated metal lockers for employees' clothes should be installed.

Cleanliness of machines and other equipment, such as transformers and oil switches is another housekeeping requirement that is particularly important. Machines covered with grease and oil are dangerous for operators and repairmen to work around. Where oil and grease are allowed to collect on a machine, the floor usually becomes soaked, thus increasing both fire and accident hazards.

The education of the operating force along these lines and the gradual attainment of these standards is no light task and requires both energy and tact in no small degree, but once this mental attitude of good housekeeping is developed it is a comparatively simple matter to maintain it. "Good Housekeeping" should be a slogan constantly in mind and rigid adherence to its basic principles will result in continuity of service.

*Abstract of a paper presented at the Seventeenth Annual Safety Congress, held at New York, N. Y., Oct. 1-5, 1928.

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News of the Industry

Ruling in Louisville

Court of Appeals upholds both operating ordinances granted recently to Louisville Railway Company

IN AN opinion written by Judge M. M. Logan and concurred in by the entire court the Kentucky Court ot Appeals at Frankfort upheld on Oct. 16 the validity of the two ordinances under which the Louisville Railway operates. This decision was the result of a suit brought by George E. Poggell and others, representatives of the Portland Civic Club, filed in the Jefferson Circuit Court in February of this year by J. Franklin Fairleigh, attorney.

An injunction to prevent the railway from operating under the new franchises given by the city of Louisville was asked in the suit. Reasons for this request were held to be that the General Council had no right to repeal the old state franchise; that the ordinance in effect lent the credit of the city to the company and that powers not properly belonging to it were given the board of public works. The court held that the ordinance of 1922, granting a new franchise, and that of 1926, repealing that franchise and granting another, changing the fare-fixing method, were entirely within the law.

The franchises in effect before 1922 were to last for ninety years, while the new ordinance allowed only twenty years. Mr. Poggell asserted the General Council had no power to shorten the franchise. In the court opinion, Judge Logan held that while the Council could not extend the term, it was within its rights, provided the action was taken under a mutual agreement to shorten the life of the grant.

While Mr. Poggell's suit charged that the ordinances in effect gave to the railway the credit of the city in the provisions for refunding bonds and that this credit would be used in handling a $6,000,000 bond issue, Judge Logan pointed out that the city had not agreed to guarantee payment of the bonds and that it was in no way liable for them.

The suit alleged that the General Council could not repeal old franchises, granted by the General Assembly, under which the railway was operating at the time the 1922 ordinance was passed. Judge Logan's opinion was that so long as the General Council did not violate any State or federal laws, it could pass such ordinances as it pleased.

None of the points brought up by the plaintiffs was sustained, the court said in its opinion. It held that the city had a right to sell a new franchise to the company on the expiration of its old franchise and found that there was no merit in the contention that it had not acted legally.

The court found no evidence that the ordinance lends the credit of the city to the company, but held that the provisions regarding bonded indebtedness were such as to allow the city to keep an eye on expenditures chargeable to capital account. It also found that no legislative powers had been delegated to the Board of Public Works.

Refused an injunction in the Jefferson Circuit Court, Mr. Fairleigh appealed his motion for the order and lost again in the higher court. The case was then submitted on its merits.

One phase of the franchise attacked was that which provides that if an increased fare request is not acted on within 60 days by the General Council it may become automatically effective. This and the regulatory power given to the board of public works were alleged by the plaintiffs to deprive the General Council of its legislative powers.

Old franchises granted by the General Assembly under which the company was operating at the time the 1922 ordinance was passed could not be repealed by the General Council, the suit alleged. In all of these points the court decided in favor of the company and the city.

In Fairness to Illinois Traction

The certificate of convenience and necessity issued by the Illinois Commerce Commission to the National Roadway Lines, Inc., to operate buses between East St. Louis and Chicago has been set aside by Judge J. S. Baldwin in the Decatur Circuit Court on petition of the Illinois Traction System, the Wabash and the Illinois Central railroads and the Nokomis Bus Lines, Inc. The court held that there was an insufficient showing of financial ability to operate and maintain the route, and contrasted the present $15,000 capitalization, which the bus promoters say will be increased to $150,000 if the certificate is issued, with $3,000,000 recently expended by the Illinois Traction in improvement of its service in the territory proposed to be served by the bus carrier and $349,000 taxes paid in the territory by the railway. The court also cited resolutions from various communities that the state highways were already overcrowded, that bus traffic would menace travel on the highways and that such operation be not provided until provision was made for the bus companies to pay adequately for the use of roads.

Veterans See San Antonio

Local public service company does wonderful job in handling American Legion delegates. Traffic rules tightened

AN INTERESTING experience in handling large crowds during an emergency is found in the way in which the San Antonia Public Service Company of San Antonio, Tex., maintained schedules on street car and bus lines during the recent American Legion national convention. Engineers of the railway, co-operating with city and American Legion officials, worked out a plan whereby a maximum amount of bus and railway service might be rendered at all hours, without interfering with the crowds attending the convention.

It was decided to block off the entire business district, prohibit parking at any point and in some instances restrict traffic. This ruling was so interpreted as to permit street car and bus traffic on the congested areas until 9 o'clock in the morning so as not to deprive downtown office workers of a service to which they have been accustomed.

Houston Street was closed to traffic from Soledad Street to Alamo Plaza, while sections of St. Mary's and Navarro Streets were also closed. Street car traffic was maintained on Commerce Street throughout the week, thus bringing passengers within a short two blocks of the main business section.

By thorough planning in advance every man allied with the railway was well informed of the plans that had been prepared and there was no confusion. Street car and bus transportation on all lines went on uninterrupted during the week, with little change in the routes.

In addition to this, special parties carrying delegates of the Ladies' Auxiliary from the Plaza Hotel to their meeting place at the First Baptist Church were transported with efficiency and dispatch. Many bands and drum corps were taken to the drill grounds where competitive contests were held.

Written notices of all changes from standard practice were printed and distributed to all interested parties, and publicity was given to any changes in street car and bus routes so that the public might not be inconvenienced. Preliminary plans of the committee of traffic regulations, final plans, maps showing restricted districts, streets closed during the parade, and other information were freely distributed.

Traffic during the week was well above normal. Tuesday, the day of the parade, was the largest in the history of the company, more than 104,000 passengers being transported by street car and bus. The report for the week

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showed an increase of approximately 73,000 over the similar period for the year 1927.

Telephones installed at logical points enabled information concerning the line of march to be transmitted quickly in the interest of bettering the regulation of traffic. Special arrangements, planned before the convention, enabled the company to transport passengers promptly to vantage points along the line of march.

During the week practically every piece of rolling stock of the company was called into play, including 71 buses. Despite the emergency nature of much of the service supplied there was little if any confusion. Such confusion in the handling of special parties as did result was due entirely to the emergency measures resorted to by the sponsors of such parties, and even in these cases was not the fault of the sponsors, but more of the individuals making up such parties, since conventionites are especially likely to be dilatory.

Virtual Dismissal of Fare Plea in Washington

The Public Utilities Commission of the District of Columbia has decided to dismiss the Capital Traction Company's petition for a higher fare on the ground that the other railway serving Washington, the Washington Railway & Electric Company, has not requested formally to be made a party to the increase. The dismissal decision, which has the approval of the commission's legal advisors, does not deny the Capital Traction Company's application for a 10-cent fare but merely refuses to make the increase mandatory on the lines of the other company. The effect is the same as a dismissal, however, since the officials of the Capital Traction Company stated during the public hearings that they would not take advantage of a higher fare unless the increase was made to apply also to the lines of the Washington Railway & Electric Company.

The present rate of fare is 8 cents cash or six tokens for 40 cents. Both companies introduced evidence showing that they are not now earning a fare return on their investments. The Washington Railway & Electric Company, however, has not so far expressed a desire for a higher fare. There seems little doubt, according to utility experts, that the Capital Traction Company will carry its case to the courts where its valuation has been adjudicated already at $25,000,000. The valuation of the Washington Railway & Electric Company, which has a much larger trackage and operates more cars, has not been fixed upon by the courts.

Those conversant with the transit situation in Washington believe that the commission has adopted this procedure in order to postpone the necessity of passing on a fare increase until Congress at its coming session has had an opportunity to dispose of the merger plan for the two lines.

Westinghouse message in "Cleveland Plain Dealer" during convention

Company Files Reply Brief in New York Fare Case

In a reply brief filed in the Supreme Court of the United States on Oct. 22, the Interborough Rapid Transit Company, New York, made a special effort to show that a federal question was involved in the effort to obtain a 7-cent fare and that the Supreme Court could properly take jurisdiction of the case. The question of federal jurisdiction was raised by the city and Transit Commission.

When oral arguments were heard by the court during the week ended Oct. 20, Chief Justice Taft gave the Interborough four days in which to file a reply brief. The city and Transit Commission have three days remaining in which to file briefs. The time of the Interborough was up on Oct. 22 and its counsel presented a brief of 73 printed pages to the court.

In its reply, counsel for the Interborough charge that the reply briefs heretofore filed by the counsel for the city and the Transit Commission contain much new matter and are not confined to supplemental arguments. They criticize this injection of new matter and at the same time seek to answer it.

Counsel for the Interborough say that they do not believe the conclusion can be escaped "that the commission's refusal of relief upon the two applications made by the appellee under section 49 gave the appellee the right to resort to the federal court at any time thereafter."

Because the Interborough did not go to the federal court in 1921 or 1922 does not destroy its right to resort to the Supreme Court, the reply brief asserts further. It says the 5-cent fare is shown to have been confiscatory in 1922 and to have been so ever since. The Interborough says:

The appellee had a right to call upon the commission for relief in 1928 under the various provisions of the statute, and then go to court when it appeared that the commission had violated all the requirements of due process and judicial hearing and had, in fact, predetermined a third denial of relief.

The Transit Commission's course is sharply assailed, and it is denied the Interborough hurried unduly into the federal court. The Interborough said:

The appellee did not "rush" to the federal court. It went there only when it became clear beyond doubt that the commission had again withheld any relief and had determined to prevent any review of the merits in any court. The "spear-head" of its offense was the virtual "lynching" proposed under section 57. The commission's device was to "reject" the 7-cent schedules in secret, and then, before serving its determination on the appellee and giving the appellee any chance to resort to any court, to start a summary proceeding and obtain *ex parte* therein a temporary injunction to prevent the appellee from charging more than the 5-cent fare and from attempting to compel the payment of a higher fare.

Among other things, the present brief of the Interborough says that the commission, in a reply brief it filed during

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the week ended Oct. 20, has belatedly challenged Comptroller's Berry's figures. It says the commission's reply is conspicuous for abandonment of any effort to sustain the immutability of the 5-cent fare on the elevated lines or to show that the 5-cent fare is adequate or remunerative on the elevated lines. The Interborough says:

In desperation the Transit Commission's reply brief makes a vicious personal attack upon the comptroller of the Interborough company, because of the figures submitted in his affidavit concerning the company's operating results.

It points out that the Transit Commission charged the company's figures were "juggled and distorted" and that the company's earnings are in fact highly satisfactory. The figures of the comptroller are defended, and it is pointed out that Dr. John Bauer, an economist employed by the city, testified that the comptroller had accurately presented the facts as to revenues, operating expenses and the like.

Franchise Negotiations to Be Renewed in Jacksonville

Negotiations between the city and the Jacksonville Traction Company, Jacksonville, Fla., in connection with a new franchise for the company probably will be resumed soon. The Council committee, representatives of the railway and the city attorney will draft the new franchise for the company. It will then be submitted to the Council as a whole for acceptance, after which it must be submitted to a referendum vote.

Tentative franchises have been drawn by a Jacksonville citizens' committee and by Peter O. Knight, counsel for Stone & Webster interests in Florida. The final franchise probably will be a compromise between the two.

The previous negotiations between the city and the company came to an abrupt close last April. In August Mr. Knight appeared before the Council and asked for the appointment of the committee headed by Councilman Hemphill. Since that time the Council has been busy considering the 1929 budget and has been unable to handle any other major legislation.

Wage Hearings Ended in St. Louis

Testimony in the wage arbitration case of the St. Louis Public Service Company, St. Louis, Mo., and its union employees, was concluded before the Missouri Public Service Commission, on Oct. 18. The commission has allowed each side ten days in which to file briefs after the transcript of the testimony is completed. Then a date will be fixed for the closing oral arguments and the final submission of the dispute. Both sides have agreed that any wage contract and working agreement the commission may recommend shall be for only one year and subject to renewal annually.

Keeping the Cleveland Discussion Green

CONDITIONS were such that the United Railways & Electric Company, Baltimore, Md., could not send any representatives to the American Electric Railway Association convention at Cleveland this year, but the officers of the company were determined not to lose the benefits of the convention, so a committee was appointed, consisting of about ten members of the staff, and a portion of the convention was assigned to each member of this committee.

It was the duty of each committeeman to dig out everything that he could possibly find in the technical journals, committee reports, bulletins, advertisements, etc., relating to this subject, and then to report to the assembled staff, consisting of about 65 members. In this way it has been able to cover both the exhibits and the speeches.

To date four two-hour interesting and inspiring sessions have been held, the remarks of each speaker being followed by lively debate. Each speaker has attempted to show the application of what went on at Cleveland to the Baltimore property and this has added greatly to the interest. More two-hour sessions are in prospect.

Seven Cents in Effect in Los Angeles

A 7-cent fare went into effect on Oct. 21 on the lines of the Los Angeles Railway, Los Angeles, Cal. There is an appeal pending at this time before the United States Supreme Court as to the legality of this fare raise. Until this appeal has been decided passengers wishing to pay one cash fare are charged 7 cents and receive a coupon entitling them to a 2-cent rebate if and when the pending appeal against the increased fares is decided against the company. Passengers wishing to purchase four rides may buy four tokens for 25 cents and are furnished with a rebate check good for 5 cents, total refund, if the transportation corporation loses its case. School children may ride under a third system of rates by purchasing a coupon book for $1.40 entitling them to 40 rides. With the book is issued a slip which will be honored for 40 cents refund in event the increased fares are later declared illegal.

Although additional revenue gained from an increase in fares from 5 cents to 7 cents will not be available until a Supreme Court decision releases it, the Los Angeles Railway, through George J. Kuhrts, president, has announced extensive improvement in its service. Sixty-five new cars with 150 additional men are to be placed in service immediately according to this announcement. Arrangements also are being made with the city officials to give street cars greater freedom in traffic, thereby speeding up the service.

New Paving Plan in Effect in Portsmouth

Gangs of the Virginia Electric & Power Company, Richmond, Va., have begun the work of removing tracks on County Street, west of Court Street, Portsmouth, as the first step in an extensive repaving program mapped out by the city. By virtue of an agreement between the city and the company, the city has taken over the company's paving obligations as concerns replacements between the rails of street car lines that have been abandoned upon consideration of a cash payment of $7,000. The company will remove the rails at a cost of approximately $12,000, which is about $9,000 less than the estimated cost of the project as originally devolving on the company to carry out.

By the change in the agreement with the company, the city was able to alter its plans as regards the repaving between the rails. It originally was provided that not only the rails but the ties would have to be removed and the street between the tracks repaved in a manner similar to that on both sides of the tracks. After a full investigation, it was decided that this provision called for a great deal of unnecessary labor and it now is proposed merely to remove the rails leaving the ballast intact as the base of the new pavement. It was found by tests that ties do not deteriorate appreciably when encased in concrete and as the rails are from 5 to 9 in. high, there will be this amount of concrete, equivalent to the thickness of ordinary concrete paving, above the ties.

Higher Fares Necessary in Kansas City

The necessity for higher fares in Kansas City was set forth in a message to employees of the Kansas City Public Service Company in a recent issue of the *Railwayan*. While 136,000,000 people were carried in 1922 only 124,000,000 were carried in 1926. Not more than 114,000,000 passengers are estimated for 1928 and the decline, which has been progressive for many months, still continues. The fact that 239 cities in the United States, each with a population of more than 25,000, have 10-cent fares, was emphasized. One of the difficult features in the situation is that while Kansas City service contrasts favorably with that rendered in any comparable city in the United States, it has fewer people per mile of track upon which to draw for patronage than most any other similar system. Powell C. Groner, president of the company, is expected to report on the situation to the City Council within a short time. According to Mr. Groner "our company has a real problem to solve, since the city can not exist without good street railway service."

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Sioux Falls Company Must Pave

The South Dakota Supreme Court has affirmed the decision of the Minnehaha County Circuit Court in the action brought against the company by the city in the paving suit. The Supreme Court held that the Sioux Falls Traction Company has failed to prove its inability to comply with a writ of mandamus issued to force it to pave along its tracks on Van Eps Avenue.

The company, in a franchise with the city, had agreed to pave at its own expense between the rails of its tracks and 1 ft. on each side on such streets as the City Council should order paved. In July, 1923, the Council ordered a section of Van Eps Avenue paved.

The company contended it could not comply with the terms of the franchise regarding paving, and a proceeding was brought by Roy D. Burns, then city attorney, to compel the action through a writ of mandamus. The court found in favor of the city and awarded a peremptory writ of mandamus, from which an appeal was taken to the Supreme Court on the ground that the company was financially unable to comply with the order.

In its opinion, the Supreme Court found that the issue of the writ of mandamus was discretionary and therefore proper, and then discussed the advisability of issuing it if the company was unable for financial reasons to comply. The court agreed with attorneys for the company that this was the issue in the case, but disagreed with them in their statement that if the company is compelled to pave it would amount to practically a confiscation of its property, saying that the company assumed the obligation when it accepted the franchise, and that taking property to satisfy legal obligation is not confiscation.

In its review of the matter the court said:

> So long as the franchise is retained the public is entitled to consideration. Duties to the public requiring an outlay of money are properly considered in fixing rates, which should be high enough to permit the company to fulfill its obligation and receive a fair remuneration on the investment, but it will not do to say where the rates are not high enough public duties may be ignored.

It was also set forth that there was no evidence to show that the current assets, or a part of them, cannot be made immediately available, nor that a large part of the monthly income cannot be used for paving. Because of this opinion, the Supreme Court affirmed the order.

Colorado Petition Granted

The Grand River Valley Railroad running between Grand Junction and Fruita, Col., has been authorized by the Public Utilities Commission to cease carrying passengers and to confine its freight business to carload lots. All concessions asked were allowed because the company was losing money.

The commission simultaneously granted the Western Motor Ways, Inc., permission to carry passengers by bus from Grand Junction to Fruita.

Slogans to Win Baltimore Riders

Attention of the public in Baltimore is being brought strikingly to the parking situation in that city by the United Railways & Electric Company urging owners of automobiles to use its cars. To this end Raymond S. Tompkins, assistant to the president of the company, prepared a number of slogans, each of which asks a question and then supplies the answer. The questions asked do not open the way to a negative answer. They have been the subject of a great deal of favorable comment and the company reports that it has received no adverse criticism. Mr. Tompkins said that other slogans would be added from time to time. The posters bearing them are attractively planned and it is impossible for the public to miss them since they are being used as dash signs on all company cars.

Hard to Park?—Take a Street Car
Curbs Crowded?—Take a Street Car
Often Tagged?—Take a Street Car
Traffic Tire You?—Try a Street Car
No Parking Space?—Try a Street Car

Slogans Already Used

Radio Program Sponsored in Fort Worth

The Northern Texas Traction Company with headquarters in Fort Worth, have sponsored a radio program to be broadcast over radio station WBAP of Fort Worth. A musical concert goes on the air Sunday between the hours of 8 and 9 p.m.

Five-Cent Zone Extended in Brooklyn

Extension of the Broadway surface line in Brooklyn, cutting the fare by surface car from Broadway Ferry to Cypress Hills from 10 cents to a nickel, is announced by the Brooklyn-Manhattan Transit Corporation. The Broadway line will be extended from East New York to Cypress Hills and the present Fulton-Crescent line will be discontinued. At present each of these lines charges a 5-cent fare and there is no transfer between them. The new arrangement is to be undertaken as an experiment for six months. It will provide a single 5-cent fare from Broadway Ferry to Cypress Hills via Broadway, Fulton Street and Crescent Street, but there will be no transfers at Crescent Street and Jamaica Avenue between the Broadway line and the lines that run to Jamaica.

Can't Louisville Have a Sunday Pass?

One of the newspapers of Louisville, Ky., recently carried a story from a person signed "A Street Car Rider," who favors the Cincinnati idea of an all-day Sunday pass on street cars at the price of 25 cents. In part the letter read as follows:

> Cincinnati and a number of other cities reaching from Boston to Atlanta have a 25-cent fare for Sunday travel. In Cincinnati all cars carry a big card bearing the slogan, "A Sunday Pass Is Cheaper Than Gas." The idea is to encourage Sunday travel. These passes are yellow cards good on the first day of the week for traveling all over Cincinnati between the hours of 5 a.m. and 12 midnight. They are transferable to others during that entire day. The only restriction is that you must be able to show the card, if called upon to do so, while traveling on a car. This is done to prevent it being handed to anyone else during the journey.

Position of Company Explained to Indianapolis Men

Replying to a demand of a committee of employees of the Indianapolis Street Railway, Indianapolis, Ind., for an increased wage scale and improved working conditions, Joseph A. McGowan, acting president of the company, has presented to the committee a letter in which he announced the company at this time could not grant the demand. He said that the wage scale now in effort wast fixed by the Indiana Public Service Commission at a hearing some months ago and that there had been no change in conditions which would permit an increase in the wage scale now. The company's revenues had not increased, but on the contrary, constantly were decreasing, and the situation would not justify a rise in the scale of wages. As to the demands for better working conditions, Mr. McGowan said the working conditions now in effect were prescribed by the Public Service Commission and he said there apparently was no basis for improvement in the conditions as they now exist.

The employers' committee, in its demand, had asked that certain of the company officials be discharged because they had discriminated against employees who were affiliated with the Amalgamated Association and had threatened to discharge employees because of their membership in the association. Mr. McGowan pointed out that the committee had failed to specify names or instances of such acts.

The committee had presented the demand a week ago to James P. Tretton, superintendent of the company, as the first step toward an appeal to the commission for a new hearing on wage scale and working condition demands. The agreement between the company and its employees provides that a demand of this kind be presented first to the superintendent and then to the president with final appeal to the Public Service Commission.

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Progress Made by St. Louis Survey Commission

The Transportation Survey Commission of St. Louis at a meeting held on Oct. 23 decided on two initial steps—the immediate preparation for introduction at the next Legislature of an enabling act to give St. Louis powers to proceed with a rapid transit system, and also the early appointment of an engineer to act as technical adviser to the commission. City Counselor Muench and E. R. Kinsey, president of the Board of Public Service, will draft the legislative measures sought by the city for submission to the state lawmakers when the General Assembly convenes at Jefferson City on Jan. 2 next.

Erastus Wells, vice-chairman of the commission, advocated immediate action by the commission on problems that really do not require the services of an engineer. He heads a committee that is studying existing transportation facilities. He suggested that the commission divide its work into two divisions, one for an engineer and the other for general matters.

Among other things he said there was no doubt but that transportation facilities should be owned by one company. "All you have to do is to drive west at 5 p.m.," he said, "and find the buses and street cars getting into each other's way. In my opinion this is a matter of common sense—no engineer is needed."

Freight Rates Fixed for Texas Electric Railway

Rates ranging from 6½ cents to 33 cents for 100 lb. for distances of 5 to more than 950 miles respectively have been prescribed by order of the State Railroad Commission for application on shipments of corncobs, maize and kafir pummies, corncob meal and pummy meal, in straight or mixed carloads, jointly between points on the Texas Electric Railway and the Texas & New Orleans Railway. Rates ranging from 5 cents to 33 cents a hundred for the same distances were prescribed for local application between points on the respective lines. The Texas Electric Railway a few months ago became the first operating electric railway in Texas to be designated as a common carrier, subject to freight regulations of the Railroad Commission. The program of the company for developing business of this kind gradually is being developed.

Greater Winnipeg Through Power Development

"What will they do with the power" has been answered in Winnipeg, Man., Canada, by the construction of a railroad to Seven Sisters Falls with thousands of tons of Winnipeg-made products to be used by hundreds of Winnipeg wage earners to build one of the most modern hydro-electric power plants on this continent. The sum of $25,000,000 will be invested in this new plant.

It was at the annual meeting of the Young Men's Section of the Winnipeg Board of Trade held two years ago that A. W. McLimont, president of the Winnipeg Electric Company, first publicly announced his company's plans for future power development. At this year's annual meeting Mr. McLimont, unable to be present, advised by letter that the Seven Sisters Falls project was no dream, but that the power developed there would give steady employment to more than 50,000 wage earners, would increase the population by more than 200,000 and would add $50,000,000 per annum to Greater Winnipeg's payroll.

A Corporation's Rights

THE Electric Bond & Share Company has not objected to being investigated. It has, however, objected to a type of investigation which the Supreme Court has characterized as a "fishing expedition into private papers on the possibility that they may disclose evidence of crime." This the court has held to be contrary to both letter and spirit of the Fourth Amendment.

In authorizing the utility investigation, the Senate resolution did not allege any violation of law, but the Federal Trade Commission interpreted its assignment not as a fact-finding investigation on definite points, but as a general search for evidence of law violation. It demanded access to all files of utility companies, regardless of whether they contained evidence pertinent to the declared objects of the investigation and regardless of the private and confidential nature of much of any company's correspondence.

The Electric Bond & Share Company has raised an issue of fundamental importance to every citizen, an issue which far transcends the question of whether any utility has been engaged in practices either reprehensible or contrary to public interest. It has asked the court to decide whether the Constituton of the United States protects corporations, their clients and stockholders, from the prying eyes of a federal agency and from a forcible public presentation of information which it feels will hurt its business. If, because of a whim of suspicion, one House of Congress is to be allowed to order an investigation by a commission which assumes judicial powers when no crime has been charged, then no individual is safe from an unconstitutional usurpation by one body of our three separate branches of government. — *Wall Street Journal.*

Free Tickets to Sale in Atlanta

The J. M. High department store, Atlanta, Ga., and the Georgia Power Company, co-operated on Sept. 24 in an idea which resulted in increased sales of tickets for the company and a record sales day for the store. Arrangements were made by R. M. Dorsen, manager of the store, to secure as many car tickets as it might need for the day. Little books with perforated coupons good for two tickets from the J. M. High Company were provided each conductor. Whenever the conductor took in a cash fare or a ticket, he presented the patron of the street car with one of these coupons. The coupon was not good unless redeemed by the J. M. High Company.

The interest of the department store was safeguarded, for no coupon was redeemed with tickets unless the customer showed a purchase slip certifying that at least $1 worth of goods had been secured. The important thing about the event from the standpoint of the railway was not the extra tickets sold but rather the fact that thousands of shoppers were shown that via the street car they could shop without concern at leisure.

Status of Youngstown Commissioner Defined

No contracts involving the lines of the Youngstown Municipal Railway may be entered into without approval of City Traction Commissioner Harry Engle, according to a recent ruling of the Ohio Public Utilities Commission. The ruling followed refusal of the City Council to allow Mr. Engle's request for authority to arbitrate the question of the traction commissioner's power to approve or disapprove such contracts. The commission further held that it would not be legal for the railway to make dual contracts involving the so-called municipal lines and the subsidiary lines. The question of the traction commissioner's authority was brought to a head by action of the company in making certain contracts for service for a three-year period, although its franchise expires in December.

Suburban Traffic at New York

Declaring that the subject of suburban passenger rapid transit is a bistate problem, the City Club of New York in the October number of its *Bulletin* announces that it is about to undertake a campaign for enabling legislation which would give to the Port of New York Authority the necessary power toward finding a solution. In outlining the problem of suburban traffic the *Bulletin* states that on each working day the volume of suburban traffic to Manhattan from New Jersey is 302,700; from Westchester, 76,500. and from Long Island, 154,000. The *Bulletin* says:

The number of commuters from outside the city limits has approximately doubled in

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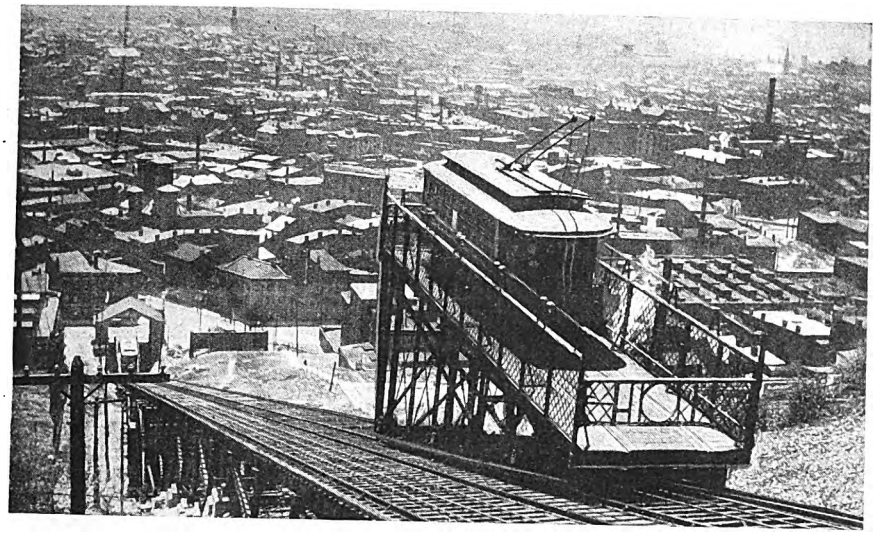


Foundations of incline, showing platform

the last ten years. The indications of the containuance of this growth are so clear as to be alarming. Unless some solution of the problem of suburban transit is found quickly the conditions probably will become within the next five years just as intolerable as the conditions of municipal transit are at this time.

Inasmuch as it is a bistate problem, an official agency with bistate functions and equipped with knowledge of the transit requirements of the entire region must be charged with the task.

The City Club's committee on suburban affairs decided that:

"The Port of New York Authority should by appropriate legislative enactment be authorized and directed to take up the subject of suburban passenger rapid transit, to investigate all phases of the problem involved and to recommend to the legislatures of the respective states and to the existing agencies involved, all necessary steps which in the opinion of the Port of New York Authority should be taken to provide a satisfactory solution of said problem, and that it be provided with the funds and equipment believed to be required for that purpose."

Co-operation in Indiana

A joint conference of representatives of Indiana electric railways and a special committee appointed by the Indiana State Chamber of Commerce for the purpose of improving co-operation between steam railroads and electric railways was held on Oct. 19 in Indianapolis. Those present concluded that public convenience and necessity would be helped by greater co-operation to the extent of joint arrangements for handling less than carload shipments and publication of joint through rates between points located on steam lines.

Members of the special committee decided to pass a resolution addressed to representatives of the electric lines advocating interchange of freight in less than carload traffic between the two classes of carriers. This resolution, it is reported, also will be submitted to the electric lines for their use before the Central Freight Association committee when it meets in November.

Cincinnati Landmark Replaced

Replacing the power house of the old Bellevue inclined plane, a landmark since 1876, the Cincinnati Street Railway, Cincinnati, Ohio, has just completed and placed in operation its new line department building on McMicken Avenue at the head of Elm Street.

For many years Central Station, located at 1323 Walnut Street, housed the street railway line department equipment and the central substation, which supplies power to the downtown business district. In rearranging the power system of the railway, the Walnut Street location was regarded as the logical place for the power dispatcher, under whose supervision the nineteen new automatic substations will be controlled. The vast amount of switching equipment required to operate these automatic substations with supervisory control required all of the space heretofore used by the street railway line department, thus making it necessary for the latter to secure new quarters. Abandonment of the old Bellevue incline furnished the necessary site for the new line department building, which also required a fairly centralized location.

The new building has just been completed at a cost of approximately $50,000. All line department power trucks and emergency cars are stored and serviced there. The department is equipped with all modern conveniences for washing, greasing and inspecting the various emergency trucks. The first floor front is arranged in four bays, each with a separate exit to the street. Each bay houses a trouble truck, three of which make emergency runs for overhead or trolley troubles, covering the downtown and Brighton districts. The fourth is a street car emergency truck which handles street car troubles downtown.

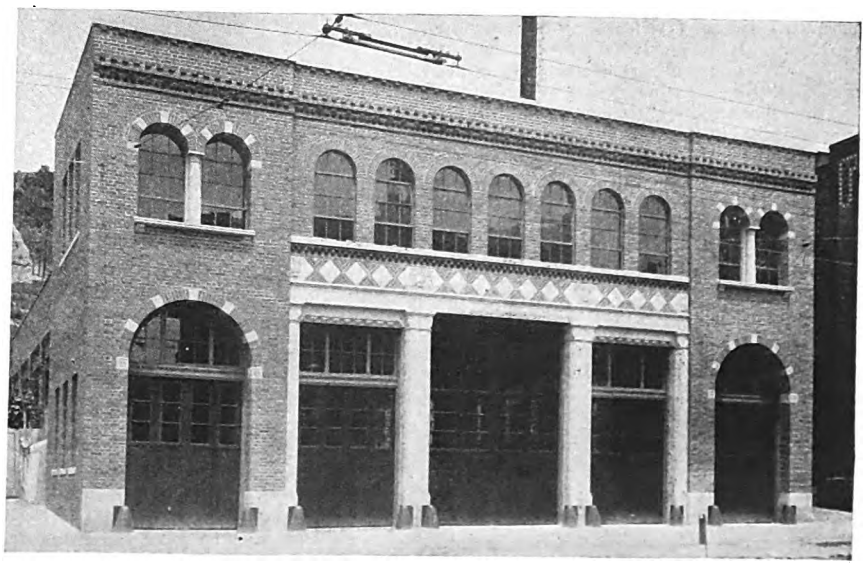
In the basement of the building are the heating plant and reservoirs for the stock of tools, supplies and salvaged material.

On the second floor are the lockers for linemen, clubroom, shower baths and toilet facilities, and the office of the line department foreman and the electric signal and switch maintenance force.

F. J. Venning, superintendent of power, has charge of the new building on McMicken Avenue. Harley L. Swift, superintendent of substations, assisted in designing the building.

Interchange by Milwaukee Company

Arrangements have been made by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., to establish freight connections and car interchange between the East Troy-Burlington rapid transit line and the Chicago & Northwestern and the Chicago, Milwaukee, St. Paul & Pacific Railroad systems. The connection with the Northwestern road is to be made just south of West Junction, and with the Milwaukee road about 1 mile north of that point. This system will effect a saving of about $9.50 per carload of freight between points on the interurban line and points on the two steam railroads.



Another monument to modernism in Cincinnati

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Employees of Key System Urged to Sell Pass

President A. J. Lundberg of the Key System Transit Company, Oakland, Cal. has expressed his pleasure at the interest shown by patrons in the Sunday and holiday pass and has urged every employee to do everything possible to create a greater use of the pass. A recent bulletin issued by Vice-President J. P. Potter, in charge of company operation, says:

Responsibility for the success of the "Sunday-Holiday pass" rests with the men in charge of the cars and buses. If you men get in and sell the pass you will help to retain the present service. Something must be done to get more riders.

RECORD OF SALE OF SUNDAY-HOLIDAY PASS BY KEY SYSTEM

Sunday, July 15		2,617
Sunday, July 22		4,027
Sunday, July 29		4,646
Sunday, Aug. 5		4,981
Sunday, Aug. 12 (Farm Show)		5,361
Sunday, Aug. 19		5,275
Sunday, Aug. 26		5,726
Sunday, Sept. 2		5,583
Sunday, Sept. 3 (Labor Day)		3,419
Saturday, Sept. 8	Admission Day Celebration	3,334
Sunday, Sept. 9		5,932
Monday, Sept. 10		5,627
Sunday, Sept. 16		5,790
Sunday, Sept. 23		5,632
Sunday, Sept. 30		5,563

In this connection the *Key Note*, official paper of the company, says:

The success of the Sunday and holiday pass depends upon the individual effort of each one of us. In particular its success depends on the man on the platform who is meeting the public, our patrons. Our ever-present slogan should be: "Sell the Sunday Pass." It requires salesmanship; but there is no reason why the 10,000 sales mark cannot be reached.

The paper says further:

The pass idea is not a difficult one to sell. Our patrons are interested in what you have to say to them regarding the pass and its advantages. The Sunday and holiday pass has many desirable sales features.

First of all it's a great buy. It sells for 25 cents. It is transferable. Anyone can use it, irregardless who the original purchaser was. It is a ticket over the entire street car and bus system of the Key with unlimited riding privileges on the day of purchase. It is good for any number of rides, any time and any place. (It is not good on transbay lines.)

How about the sightseeing angle? Have you talked this slant of the pass idea over with any of our riders? The Sunday and holiday pass affords an excellent opportunity for sightseeing. This point should be stressed in urging our patrons to use it. Just think of it—there are over 270 miles of sightseeing awaiting the pass user. The parks and beaches of Alameda and Oakland, the University of California, the fruit and agricultural sections of San Leandro and Hayward, the home sections of Piedmont and East Oakland, the marine view from North Berkeley, and the industrial sections of Richmond—all await the pass user. Tell our patrons about the sightseeing possibilities with a Sunday and holiday pass.

Buy a pass and save gas! Need we say more in regard to the economy of using the street car in place of the family automobile? And then there's traffic and parking relief. How about this point? Have you told 'em about that? When you use a street car there's no parking to worry about and no traffic congestion and wild drivers to cause you concern. Buy a pass and save gas!

Contesting Income Tax in Cleveland

Upon the authorization of the City Council of Cleveland, Ohio, the city law department will assist counsel for the Cleveland Railway in contesting in the Federal Circuit Court of Appeals at Cincinnati the ruling made by the United States Board of Tax Appeals about the railway's income taxes on the so-called interest or fare barometer fund, which regulates street car fares. The internal revenue bureau has a claim of $498,000 against the railway. A final judgment against the company which would require it to pay this amount would probably mean an immediate increase in the rate of fare.

The United States Board of Tax Appeals ruled that the interest fund, though held in trust for the benefit of all the car riders, was subject to taxation. The city has entered the case on the theory that the citizens have a vital interest in the outcome of the suit.

The city law department, however, recently received a letter from Attorney C. M. Charest, general counsel for the United States bureau of internal revenue, asserting that a three-party argument would confuse the court and that the city's interest is not sufficient to make it a party defendent. The city intends to ask the court for permission to intervene, in spite of Mr. Charest's objections.

Foreign News

Increased Traffic in Aberdeen

A total of 52,937,480 passengers was carried on the cars and buses of the tramways department of the city of Aberdeen, Scotland, during the year ended May 31, 1928. This figure compares with 47,120,025 carried on the cars and buses for the year ended May 31, 1927. Revenue earned by the combined tramways and motor bus undertakings was £219,023, compared with the previous year's total of £195,468, This increase was accounted for by the elimination of a large number of privately-owned buses for hire entirely within the city in opposition to the tramway undertakings. These facts were disclosed in the report for the year addressed to the members of the tramways committee. The net profit from the tramways for the 1927-1928 period was £6,184 and for buses a balance of £11,028 was carried to the depreciation and renewal account. Total tramway car mileage in 1928 was 2,702,548, against 2,564,718 in 1927. The buses ran 1,598,758 miles in 1928, compared with 1,309,461 miles the previous year, or an increase of 289,297 miles.

New Depot at Liverpool

More than two years ago the work of erecting a new tramway depot and car works in Liverpool, England, was begun and the buildings are about to be opened for service. They cover an area of about nine acres. The cost has been about £400,000.

Highway Powers for British Railways

Bills promoted by the four main line British railways to give them enlarged powers to carry passengers and goods on the public roads have now been passed by both Houses of Parliament. Accordingly it is expected that before long the railway companies will be running both buses and goods vehicles in many parts of the country in competition with the road transport companies which have taken away so much traffic from the railways, and also with municipal tramways outside of municipal boundaries.

Street Railways Planned in Canton

It is reported that the Kwantung Tramway will soon begin laying tracks for a new street railway in Canton, China. Some years ago the local government granted a franchise to the Kwantung Tramway to build and operate street railways in Canton. After considerable delay a shipment of steel rails was received from Germany but no further progress was made and the rails have been kept in storage.

Cleansing Equipment for London Cars

All the depots of the Metropolitan Electric Tramways, London, England, have been fitted with the latest type of car-washing equipment which was first installed, some months back, at Wood Green depot. The equipment consists of what are known as "water pistols" which are attached to flexible pipes coming from iron water pipes in the roof of the depot. These "water pistols" can be attached to brushes and mops for cleaning the outside of the cars from top to bottom. They can likewise be used for cleaning trucks and undergear; high water pressure being obtained through powerful pumps. By the new equipment it is claimed that a tramcar can be thoroughly washed in less than two minutes.

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Recent Bus Developments

New California Service Authorized

A certificate of convenience and necessity has been granted by the California Railroad Commission to the Pacific Coast Motor Coach Company to operate a thorough-car auto stage service for the transportation of passengers and their baggage between Long Beach and Newport Beach, Laguna Beach, Serra and Juan Capistrano. This company is a subsidiary of the Pacific Electric Railway. The certificate is granted on condition that no local service be conducted between Long Beach and Newport Beach, nor shall passengers be transported from Serra to San Juan Capistrano, but pasengers may be transported from points intermediate thereto. The commission also authorized Pacific Coast Motor Coach Company to unite this service with its present operations.

The commission denied the application of Pickwick Stages System for authority to extend its auto stage service between Long Beach and San Diego and intermediate points, via the Sea Shore and Coast routes, and to consolidate and merge the same with its existing operations. Commissioners Carr and Decoto, in their concurring opinion, served warning on the Pickwick Stages System that its application is being denied because it has violated the terms of its existing certificates, authorizing it to serve the terminals involved, via the Santa Ana route and that its disposition to observe or disregard the decisions of the commission must be taken into consideration when extensions of its service are applied for.

In its decision the commission finds that public convenience and necessity do not require the service proposed by the Pickwick Stages System, but that it does require the service proposed by Pacific Coast Motor Coach Company and that the certificate should be issued to that company, provided more modern and efficient equipment is placed in service than is now used by that company in its operation between Newport Beach and Laguna Beach. The commission makes its certificate effective when the Pacific company has procured 29 to 33 passenger stages for this service, as proposed in the hearing before Examiner W. R. Williams of the commission.

New Rochelle Line Goes Over to Bus

The Public Service Commission authorized the Westchester Electric Railroad on Oct. 23 to substitute bus operation for trolley cars eastbound on its tracks from the Mechanic Street terminal in New Rochelle to the city line and westbound from the city line to the terminal. New Rochelle consented to the change by resolution of its Common Council on Aug. 14, and evidence submitted to Commissioner Van Namee showed that operations on the East Main Street line had been at a loss and that there was an operating loss on all lines of the Westchester Electric Railroad for the first six months of 1928 and for the years 1918-1927 inclusive.

Commissioner Van Namee, in a memorandum approved by the commission, said that the local consents permitted the charging of a 10-cent fare on this line, an increase of 5 cents over the trolley fare. Transfers were to be furnished to all lines in New Rochelle without additional cost and from all other lines to the bus lines at an additional cost of 5 cents. He added that this arrangement would provide additional revenue and improve the financial condition of the company. It is felt this change of mode of operation meets the demands of the times and serves the needs of the public.

Chartered Bus Service Grows

Phenomenal business being done by New Jersey Company in supplying transportation of this kind. Buses for funerals

DURING the first eight months of 1928, the chartered bus business of Public Service Co-ordinated Transport, Newark, N. J., continued its rapid growth. On July 12 the North Jersey Street Railway Benevolent Association chartered 63 buses for its annual excursion to Asbury Park. All records were broken, however, on July 19, when the Prudential Life Insurance Company Athletic Association engaged 80 buses to take its members and friends on an excursion to the seashore. More than 2,300 people went on this seashore trip. Eight extra buses were enlisted in the fleet to provide against any possibility of delay due to tire trouble.

One of the most interesting trips which the department has yet operated, began Oct. 7, when 150 members of the Allgemeiner Deutscher automobile club of Germany left New York City in seven Public Service buses for a two weeks' tour in the eastern half of the United States and Canada. The party was to visit the Ford and the General Motors plants in Detroit, making a first hand study of motor conditions in the United States. The total length of the trip was to be about 2,000 miles.

During the twelve months of 1927, the total number of miles operated on chartered bus trips amounted to 356,687. Compared with this figure, results for the first eight months of 1928 show a total of 358,888 miles operated, or an increase of 2,201 miles over the full twelve months of 1927. Growth in the business is further shown by the size of the individual orders. During 1927 only three orders were received exceeding 25 or more buses, whereas in 1928 the department operated ten trips requiring more than 25 buses.

The charter bus and car department was organized as an integral part of the transportation department, under the supervision of a passenger agent. Each of the Co-ordinated Transport's seven division managers actively assists the agent by assuming full responsibility for operating all chartered or special buses within the limits of his particular division. To assist in this work each division manager has appointed a member of his staff to devote part time to chartering buses. The division managers and their assistants also help the agent to solicit new business.

Selection of men to operate chartered buses is also in the hands of the division managers, who maintain an active list of regular operators available for this service. Experience, personality, skill in driving, knowledge of roads, and inclination for the work, are some of the qualities making a good chartered bus operator.

Harold B. Whitman, passenger agent of Public Service Co-ordinated Transport, writing about the chartered service in *Public Service News*, the company's own publication, says:

> If the rapid increase in the size of chartered bus parties has been remarkable, the wide variety of new uses to which it is being put is no less astonishing. Almost every day or so someone calls at the chartered car and bus office and hires a bus for some new purpose. Recently, the representative of a walking club chartered a bus for a two-day hiking trip. Traveling by bus into the mountains, the club members, put their heavy clothing in the bus and sent the driver 15 miles beyond to await the arrival of the hikers.
>
> Here are just a few of the purposes for which Public Service buses have been chartered: Athletic events, conventions, picnics, weddings, funerals, political meetings, inspection trips, lodge meetings, real estate developments, skating parties, to carry children to school, natural history trips, religious services, theater parties, and to carry men to work in industrial plants located away from regular lines of transportation.

Service by Bus to Be Continued on Ohio Route

The oldest electric line in Ohio, the Sandusky, Milan & Norwalk Electric Railway, is to be abandoned. A delegation of Milan citizens recently appealed to the Erie County Commissioners to obtain assurance from the Lake Shore Electric Railway that they will have transportation from Milan to Sandusky and Norwalk when the tracks are torn up. L. K. Burge, vice-president and general manager, said that buses operated since the storm last March would continue to run.

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New Service in Amsterdam Will Not Compete with Railway

The Public Service Commission recently granted a certificate to Charles Vollmer for operation of a bus line in the city of Amsterdam, N. Y., from East Main and Market Streets. According to a consent granted by the city, Mr. Vollmer, under the certificate granted, will not pick up passengers eastbound in East Main Street, whose destination is south of the corner of Vrooman Avenue and Forbes Street as the Fonda, Johnstown & Gloversville Railroad is now furnishing service in that section. The railway company opposed operation of the bus line in that section northeast of Lyon Street where it operates its Market Street line.

The commission, however, finds that the bus service will be convenient to residents of that section. Another section of the bus line will give service in that part of the city where the trolley line has abandoned service. A 10-cent cash fare with three tickets for 25 cents is planned by the bus operator and school childrens' tickets will be sold at fifteen for $1.

Permission for New Boston Route Sought

The Boston Elevated Railway, Boston, Mass., has filed a petition with the Public Utilities Commission for the approval of a proposed bus line involving the operation of a belt line from Fields Corner and return. Authority is sought to operate seven buses all the time and ten buses when traffic warrants. Plans for this bus line have already been approved by the State Department of Public Works and the Boston City Council.

Buses Replace Cars on Illinois Lines

The East St. Louis & Suburban Railway replaced its street cars between Collinsville and Edgemont and Collinsville and Edwardsville, Ill., with buses on Oct. 12 in accordance with authorization by the Illinois Commerce Commission. The street cars had been in service for 30 years. An hourly service will be maintained until traffic warrants a shorter schedule.

Emergency Service on Washington Route

Temporarily the Pacific Northwest Traction Company has abandoned its interurban service between Bellingham and Mount Vernon, Wash., due to the condemnation by company engineers of an approach to its Skagit River steel bridge. The gap has been filled by operating additional buses. Several months may pass before service is restored, according to Harry M. Sewall, Bellingham manager of the company. Pending repairs, to the bridge, Mr. Sewall said the company would operate interurban freight service to Burlington. Freight consigned to Mount Vernon will be handled by the Great Northern Railway, and passenger service will be by bus.

Stark Electric Opposes Bus Company

The Ohio Public Utilities Commission has dismissed the answer and cross petition of the Stark Electric Railroad, Alliance, and so disarmed the company and left an opening for the Salisbury Transportation Company, a bus line, to press its attack against the Stark Electric schedule.

The two companies are operating interurban lines between Alliance and Canton. Both are after business between Canton and Louisville a distance of 5 miles, where the bus line operates parallel to the railway.

Some time ago the Stark Electric adopted a fifteen-minute schedule between Louisville and Canton. The Salisbury Transportation Company filed a protest with the Public Utilities Commission at Columbus, claiming that the fast schedule was not warranted and that it had been adopted only to force the bus line out of business.

Officials of the bus company also say that the railway was diverting from the proceeds of a bond issue money to be used only for permanent improvements prescribed by the State Utilities Commission.

In retaliation, the Stark Electric, through Attorney C. M. Shetler, Canton, filed an answer and cross petition, claiming that Attorney S. L. Geiger, Alliance, secretary and treasurer of the bus line, had conspired with the Ohio Public Service Company to put the railway out of business.

After considering the two complaints, the state board ordered the Stark Electric's cross petition and answer stricken from the records, leaving only the Salisbury charges to be decided when the case comes up for an official hearing.

Boston-Billerica Scene of Contentious Route

The Eastern Massachusetts Street Railway and the Boston & Maine Railroad continue to contend for the right to operate buses between Billerica and Boston, Mass., with developments in favor of the railway. The Board of Selectmen of the Town of Billerica on Oct. 17 granted the Eastern Massachusetts licenses to operate in that town, after having the application on the table for the past several months. Burlington, Winchester and Arlington have already passed favorably on licenses for the railway towns through which the buses would pass. The City Council of Woburn has granted a license, which, however, has not been signed by the Mayor. Cambridge has refused the street railway, while Burlington and Woburn have turned down petitions by the Boston & Maine. The city of Boston has petitions from each company but has not acted.

Trial 25-Cent Route in Cleveland

A 90-day trial of a 25-cent fare express motor coach route has been authorized by the City Council of Cleveland, Ohio, over protests of the Cleveland Railway. The company is anxious to experiment with express motor coach operations, but does not believe the route chosen will show the best results. It also may refuse to carry out the order of the Council on the ground that it has insufficient equipment.

The Council directed the company to operate coaches from the Public Square to the eastern line of the county border, by way of Lake Shore Boulevard, a distance of about 15 miles as the bus travels. Stops will be made within the city of Cleveland only in the downtown district and at important intersections. Objection was made because the route chosen will parallel a local Cleveland Railway route and a through intercity bus line in Euclid Village and also will parallel the Clifton-Carnegie bus line in the downtown section of the city.

The railway urged an experimental express route from Lakewood, but the Council declined to pass legislation of this kind because Lakewood has declined to enter into negotiations for a revision of fare along the lines recommended by the Metropolitan Transportation Commission.

Company Concedes Jurisdiction Over Pittsburgh Bus Service

A. W. Robertson, president of the Philadelphia Company, says that organization will facilitate any move to place the operations of the Pittsburgh Motor Coach Company, subsidiary of the Pittsburgh Railways, under the jurisdiction of the Traction Conference Board. An open letter to him explaining the matter closed by stating that its object was to eliminate all red tape and to make it as easy as possible for the Council or the conference board to get any facts they may desire. The text of the letter follows in part:

I noticed in the newspapers that the Council has given some attention to the matter of a contract between the city and the Pittsburgh Motor Coach Company, similar to the present contract between the city of Pittsburgh and other municipalities, and the Pittsburgh Railways. We would be very glad to co-operate in any way to expedite the execution of such a contract.

We had always assumed that for all practical intents and purposes the Pittsburgh Motor Coach Company was subject to the terms and provisions of the present agreement with the Pittsburgh Railways, although in the absence of an agreement the Traction Conference Board would have no formal authority.

So, without waiting for a formal contract to be prepared and executed between the parties, we will be very glad indeed to furnish the Council, or the Traction Conference Board with any and all information which may be desired in regard to the Pittsburgh Motor Coach Company, and submit the company to the jurisdiction of the Traction Conference Board the same as though the agreement were executed.

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Financial and Corporate

Purchase of Texas-Louisiana Power by General Waterworks

The General Waterworks & Electric Corporation, New York, formerly General Waterworks Corporation, operating in Idaho, Texas, Indiana, Kentucky and Pennsylvania, has acquired all the common stock of the Texas-Louisiana Power Company, which operates among other services transportation properties in Texas, Louisiana, Kentucky, Arizona, Oklahoma and New Mexico. The purchase price was not given in the announcement made on Oct. 13 by A. P. Barrett, chairman of the board of directors of both companies.

The present management of the Texas-Louisiana Power Company will continue to operate and direct that corporation and also will manage and operate the General Waterworks & Electric Corporation, said Mr. Barrett, formerly president of the Texas-Louisiana, who has become chairman of the boards both of that company and of the General Waterworks & Electric Corporation.

Allen J. Smith, who has been general manager of the Texas-Louisiana Power Company, has become vice-president and general manager of both companies. A. D. McNab, who has been treasurer of the Texas-Louisiana, has become secretary-treasurer of the Texas-Louisiana and assistant treasurer of the General Waterworks & Electric.

Headquarters and general offices of both companies will be in Fort Worth.

Lincoln Traction Under Delaware Laws

All property of the Lincoln Traction Company, organized as a Nebraska corporation, has been transferred by deed for a consideration of $1 to the Lincoln Traction Company, recently organized under the laws of Delaware. The company is a United Light & Power subsidiary. C. N. Chubb, president, says that no changes in the company's financial structure or personnel are contemplated. All other United company properties are organized as Delaware corporations because of certain advantages and material benefits attaching.

Interstate Would Offer Securities

The Interstate Public Service Company, Indianapolis, Ind., has petitioned the Public Service Commission for permission to issue $1,255,600 in par amount bonds and 7,217 shares of no par value common stock to reimburse the company for funds expended in additions and improvements to its properties.

The bonds would be first mortgage and refunding bonds bearing 5 per cent interest and would be sold at not less than 91½ per cent of par. The no par value stock would be sold for $75 a share.

From Jan. 1, to Sept. 30, according to the petition, $1,690,177 was expended for improvements. From this amount, $16,020 was deducted because it was spent on leased properties for which no bonds may be issued.

Loss on Third Avenue

President Huff states fare under present conditions insufficient to make return. Bus operation valuable

FOR the fiscal year ended June 30, 1928, the operating revenue from the railway lines of the Third Avenue Railway System, New York, N. Y., was $15,599,602, an increase of $227,053 compared with the fiscal year ended June 30, 1927. The increase in operating expense was $429,136, due largely to an increase in wages of about 5 per cent which became effective April 3, 1927, and an increase in the amount set aside to cover the cost of damages and legal expenses of 1 per cent of gross receipts. The company suffered a deficit for the year of $43,761 against a net income last year of $276,815.

On the subject of cost of damages and legal expenses S. W. Huff, president, in the annual statement to the stockholders explains that a reserve of approximately $500,000 had been created on the basis of 7½ per cent of the gross receipts. The increased cost of accidents in recent years, due to greater congestion in the streets and larger verdicts of juries, had resulted in a cost in excess of the amount set aside and this excess cost had absorbed practically the entire reserve. For the past fiscal year the percentage was increased to 8½ per cent. At the same time a persistent drive had been made to reduce accidents and accident costs, with the result that during the year a reserve of approximately $200,000 had been created.

The operating revenue from the bus lines of the system was $742,951 while the operating expenses of these lines was $783,515. The net loss of this operation after adjustment for intercompany transactions noted in the accompanying consolidated income statement constitutes a deduction from the gross income of the railway system. The bus revenue and expense are not included in, but are an addition to, the revenue and expenses of the railway system. Referring to the bus system of the Third Avenue Railway Mr. Huff remarked that previous to the past year the bus operation of the system had been confined to scattered lines in Westchester County with a fare of not less than 10 cents. During the past year, however, the Bronx system of 58.18 miles, requiring about 125 buses, had been put into operation on a 5-cent fare with two 5-cent zones on one line and three 5-cent zones on another. He said the time had not been sufficient to determine just what the result of the operation of buses on a 5-cent fare would be. The receipts have been somewhat larger than anticipated with a 5-cent fare, and the operating expenses are greater than they should be due to the cost of instituting a new service and the necessity of operation from temporary garages. Approximately $6,000 a day is being collected from buses operating in the Bronx.

The established bus routes have conclusively proved their values as feeders to, or extensions of, electric lines; and where proposed bus lines, independently operated, threatened serious competition with electric car lines of the system. He said the immediate problem before the management was the systematizing and refinement of bus operation so as not only to prevent this operation becoming a drain upon the railway operation but to have it contribute to the net earnings of the system. In concluding his statements Mr. Huff referred to the inadequacy of the 5-cent fare under present operating conditions to provide a proper return upon the investment, and the efforts being made to secure relief through an act of the Legislature and relief also from unjust taxation in the matter of paving.

CONSOLIDATED INCOME STATEMENT OF THIRD AVENUE RAILWAY AND CONTROLLED COMPANIES

	1928	1927
Operating Revenue:		
Transportation	$15,142,297	$14,858,299
Advertising	150,000	150,000
Rent of tracks and terminals	18,503	23,448
Rent of buildings and other property	188,098	230,633
Rent of equipment	52,300	58,482
Sale of power	8,403	11,686
Total operating revenue	$15,559,602	$15,332,549
Operating Expenses:		
Maintenance of way and structures	$2,468,773	$2,085,564
Maintenance of equipment	1,518,073	1,416,736
Depreciation accruals	*196,126	210,305
Power supply	980,973	928,374
Operation of cars	5,218,544	5,029,683
Injuries to persons and property—expended	1,087,966	1,183,028
Injuries to persons and property—reserved	199,718	.....
General and miscellaneous expenses	645,359	640,453
Total operating expenses	$11,923,282	$11,494,146
Net operating revenue	$3,636,319	$3,838,402
Taxes	1,123,101	988,460
Operating income	$2,513,217	$2,849,942
Interest revenue	222,577	222,713
Gross income	$2,735,795	$3,072,655
Deductions from gross income:		
Interest on first mortgage bonds	$513,080	$513,080
Interest on first refunding mortgage bonds	879,620	879,620
Interest on adjustment mortgage bonds	1,126,800	1,126,800
Track and terminal privileges	17,851	19,041
Miscellaneous rent deductions	8,071	8,747
Amortization of debt discount and expense	23,354	24,298
Amortization of limited franchises	8,294	8,270
Sinking fund accruals	33,480	33,480
Bus operation—net loss	38,553	34,153
Miscellaneous	130,450	148,347
Total deductions	$2,779,557	$2,795,840
Net income	*43,761	$276,815

*Deficit.

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Bankers Optimistic About Electric Railways

John P. Baer, Baltimore, chairman of the public service securities committee of the Investment Bankers' Association, in session in Atlantic City, N. J., during the week ended Oct. 22, said that a review of conditions in the industry, including a forecast of the near future, should give ample satisfaction that the next few years will see an even greater development in electric light and power than ever before.

Despite decreasing patronage and growing traffic congestion in the cities, the electric railway industry of the United States faces the future with more optimism than it has felt for the past few years, which undoubtedly have been dark ones. Six years ago electric railways were spending virtually nothing for advertising. In 1928 their expenditures probably will reach $7,000,000, or $1,000,000 more than in 1927. Despite the dismal outlook, the report continues, they planned to spend more on better service during 1928, and their outlay for additional cars, better track and faster schedules probably will total close to $250,000,000 for 1928, or $25,000,000 more than in 1927. The report deplored the "5-cent fare fetish," pointing out that since 1914 operating costs went up nearly 200 per cent, while fares went up little more than 50 per cent. The committee says:

> Not even the most optimistic street railway man believes the industry is out of the woods yet or anywhere near it, but they are all now certain that any idea of extinction was merely a nightmare, that the bottom has been touched and the way is now upward.

The committee recommended that further action on a uniform public utilities act be deferred for the present; the status remains unchanged from the action taken at the annual meeting in Seattle last July, when it was recommended that no action be taken because of a substantial lack of unanimity of opinion as to the desirability of regulation of utility securities by utility commissioners.

Concerning the investigation of public utilities by the Federal Trade Commission and the issuance by the latter of a questionnaire requiring voluminous information, the report says:

> Your committee takes the stand that the industry has nothing to fear from a non-political, fact-finding investigation and approves all education work, whether by way of news articles, by way of paid advertisements or by any other fair means, provided the subject matter is presented truthfully and fearlessly.
>
> Your committee feels that the public management can be depended upon to discourage any effort to include in their education program ambiguous statements or subject matter that may mislead or may convey an incorrect impression. Your committee believes that the utility corporations as a whole are honestly managed, and have been and are one of the forces of primary industry which has made America great, and we feel that if the effort to federalize or nationalize public utilities is successful, a great calamity will have fallen upon this country.
>
> We now reaffirm the position so often taken by the Investment Bankers' Association of America that we are entirely opposed to the entry of the government into business and we feel that, both as to quality and cost of service, the people of this nation are better served under private than under public ownership and we reaffirm our belief in state commission control rather than federal administration.

Successor to Detroit United Now Functioning

In commenting on the completion of the Detroit United Railway reorganization, A. L. Drum, president of the Eastern Michigan Railways, said recently that the new company was now in possession and that he expected that the full interest on the new adjustment mortgage bonds would be earned and paid when due on April 1.

Canadian Roads Make Good Showing

According to the report of the Canadian Bureau of Statistics, electric railway mileage decreased 32.03 miles in 1927 and the number of passengers carried increased by 32,687,358, to a total of 781,398,194. The average fare 6.25 cents remained unchanged, but the gross passenger revenue increased by $1,993,038. On the other hand freight and other revenue decreased, making the total net increase $1,783,202. The total bus mileage of all railways in Canada was 8,263,498. Twenty-six out of the sixty electric railways reporting showed losses aggregating $1,212,796 and only seven paid dividends.

Although there was a net increase in the passenger traffic of all the railways, many of the smaller systems showed a falling off in the number of fare passengers carried. The Peterboro Radial ceased operations on March 31, and the Chatham, Wallaceburg & Lake Erie ceased operating passenger cars on July 1, but continued a freight service. The Schomberg & Aurora, a branch of the Toronto & York Radial, also ceased operation on June 20, and the Kitchener & Bridgeport Railway, which was purchased on Oct. 1, 1923, by the city of Kitchener, was operated along with the Kitchener & Waterloo Railway as the Kitchener Public Utilities Street Railway Department.

For the first time in the past 27 years no passengers were killed in electric railway accidents, but seven employees and 71 other persons were killed.

The numbers of other persons both killed and injured were larger than for any year since 1920, which is probably due to the increased congestion of traffic on the streets that has been caused mainly by the automobiles and by the motor trucks.

The aggregate gross revenue received by all electric railways in 1927 was $53,506,401 and net operating income $15,889,833. This compares with $51,723,199 and $15,269,490, respectively, in the preceding year.

More Mitten Securities Offered in Philadelphia

Another block of Mitten Bank Securities Corporation preferred stock, cumulative and participating, of a par value of $25, is being offered to the public. The preferred pays a first return of 6 per cent, after which the preferred stock shares equally with the common in all dividends declared. The common receives no dividend until the preferred pays more than 6 per cent and cannot receive more than the preferred until the preferred pays over 7½ per cent. At present the preferred is earning a dividend of 7 per cent per annum. Dividends are payable Feb. 15 and Aug. 15.

T. E. Mitten, president of Mitten Management, Inc., in a letter to the people of Philadelphia dated Oct. 16, 1928, said in part:

> You have invested more than $30,000,000 in Mitten-managed properties in recent years, much of it through Mitten Bank Securities Corporation.
>
> The proper direction of these millions of savings is to us a solemn trust. But it does not stop there. Our organization is behind MBSC not only with its ability and integrity, but with its money as well.
>
> Mitten Management's success in Philadelphia has led to its frequent mention as the possible operator of large transit systems in other cities. But whatever may develop elsewhere it will never affect our responsibilities here. My personal means and energies, as well as those of my associates in Mitten Management, will continue to be directed toward strengthening the structure which we have built up here through many years of service.
>
> MBSC was formed a year ago to bring public, men and management into one investment group. The resources of Mitten Management have since been so administered as to best advantage MBSC. PRT employees have transferred to MBSC the very large holdings which they formerly had in PRT, with great advantage both to their own investment fund and to MBSC. Besides owning preferred stock men and management together hold a majority of the common stock of MBSC. The common receives no return until the public's investment in preferred has received its dividend, nor can the common dividend increase except as the preferred dividend increases.
>
> This is what makes MBSC so attractive to the small investor. It is not often that he can invest directly in an industry where management and workers back his investment with their money as well as labor.

Acquisition of California Line by Western Pacific

The Sacramento Northern Railway, a subsidiary of the Western Pacific obtained permission on Oct. 25 to take over and operate the 87-mile electric line of the San Francisco-Sacramento Railroad between Oakland and Sacramento. The cost of the property was placed at $1,675,000. It was held probable by the Interstate Commerce Commission that the San Francisco-Sacramento would not be able to operate as an independent line, whereas as a unit of the Western Pacific operations could be maintained.

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$199,781 Deficit on Municipal Railway, Research Bureau Says

William H. Nanry, director of the San Francisco Bureau of Governmental Research, in a report on the San Francisco Municipal Railway, San Francisco, Cal., for the fiscal year 1927-1928, just issued, says that the financial situation of the railway is slowly moving to a crisis. According to Mr. Nanry the bureau has completed an extensive study of the Municipal Railways, its finances, management and accounting and operating policies. This study leads the bureau to believe, Mr. Nanry states, that the maintenance of the 5-cent fare will require radical readjustments or a resort to taxation to meet deficits. The report says in part:

The official statement shows a net income from the year's operations of $34,-100; eliminating profit on the sale of securities, this is charged to a deficit of $3,781. Such deficit is exclusive of bond redemption charges. Taking account of the year's requirements of $196,000 for the redemption of bonds, the net deficit of $3,781 is increased to $199,781.

The official statement included as a profit the difference between the book value and the market value of securities (in which depreciation fund balances were invested) which were sold during the year. The bureau does not consider that the increased value of the securities occurred during the period covered by the statement and therefore does not include the profits, amounting to $37,881 net, as an earning. The bureau understands that the firm of accountants making the audit takes the same position. Should this profit be included, however, the net deficit after provision for redemption of debt, but before "comparison charges" are deducted, would be $161,900.

Passenger revenue for the year increased $63,675 over 1926-1927, compared with an increase of $2,237 for 1926-1927 over the previous fiscal year. The increase may be largely accounted for by an increase in operations for the year, amounting to 3,936 car-hours and 19,359 bus-hours.

The cost of operation shows an increase of $142,987. The ratio of operating expense to operating revenue increased from 84.4 per cent for 1926-1927 to 86.9 per cent for 1927-1928. The year's increase in operating costs, being more than double the increase in operating revenues, resulted in a decrease of $77,654 in net operating revenue as compared with 1926-1927.

The official statement does not show the payments made from railway funds for the redemption of the bonded debt of the railway, which has always been met by railway revenues. For 1927-1928 redemption payments totaled $196,000.

The operative fund shows a cash deficit of $13,867, offset by "accounts receivable" of $100,385, of which $82,124 is due from the city's general fund on account of past advances from railway funds for Twin Peaks and Stockton Street tunnel costs.

City officials and representatives of municipal ralway employees have frequently stressed the maintenance of the 5-cent fare, usually because of an assumed advertising value to San Francisco, sometimes as a practical necessity until the city shall have acquired the existing privately owned systems. As has been pointed out by the bureau in the past, the financial situation of the railway is slowly moving to a crisis.

Decentralization in the management and control of the railway has affected operating costs and conditions and extension policies, and has been urged, by both citizens and officials, as one of the principal arguments for a properly constituted Public Utilities Commission.

Conspectus of Indexes for October, 1928

Compiled for Publication in ELECTRIC RAILWAY JOURNAL by

ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Last 5 Years High	Last 5 Years Low
Street Railway Fares* 1913 = 4.84	Oct. 1928 **7.66**	Sept. 1928 **7.65**	Oct. 1927 **7.54**	Oct. 1928 **7.66**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	Oct. 1928 **144.9**	Sept. 1928 **144.2**	Oct. 1927 **141.8**	April 1923 **175.3**	Feb. 1928 **139.5**
Electric Railway Wages* 1913 = 100	Oct. 1928 **229.9**	Sept. 1928 **229.7**	Oct. 1927 **228.2**	Oct. 1928 **229.9**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Oct. 1928 **205.5**	Sept. 1928 **204.4**	Oct. 1927 **199.8**	March 1924 **206.8**	Jan. 1923 **187.3**
Eng. News-Record Construction Cost (General) 1913 = 100	Oct. 1928 **207.7**	Sept. 1928 **207.3**	Oct. 1927 **204.4**	March 1924 **224.7**	Nov. 1927 **202.0**
U.S. Bur. Lab. Stat. Wholesale Commodities 1926 = 100	Sept. 1928 **100.1**	Aug. 1928 **98.9**	Sept. 1927 **96.5**	March 1923 **104.5**	April 1927 **93.7**
Bradstreet Wholesale Commodities 1913 = 9.21	Oct. 1928 **13.13**	Sept. 1928 **13.28**	Oct. 1927 **13.26**	Dec. 1925 **14.41**	July 1924 **12.23**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Sept. 1928 **157.8**	Aug. 1928 **154.2**	Sept. 1927 **154.0**	Nov. 1925 **167.1**	May 1924 **141.0**
Cost of Living Nat. Ind. Conf. Bd. 1914 = 100	Sept. 1928 **163.4**	Aug. 1928 **161.4**	Sept. 1927 **162.8**	Nov. 1925 **171.8**	Feb. 1923 **157.5**
Industrial Activity Elec. World—Kw.-hr. used 1923-25 = 100	Sept. 1928 **124.2**	Aug. 1928 **119.0**	Sept. 1927 **118.4**	Feb. 1928 **127.7**	July 1924 **73.4**
Bank Clearings Outside N. Y. City 1926 = 100	Sept. 1928 **105.7**	Aug. 1928 **99.9**	Sept. 1927 **101.3**	May 1928 **108.4**	Aug. 1923 **81.6**
Business Failures Number	Sept. 1928 1348	Aug. 1928 1545	Sept. 1927 1417	Jan. 1924 2231	Sept. 1925 1348
Liabilities (Millions)	**22.11**	**35.55**	**52.65**	**122.95**	**22.11**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

Unearthing Facts in St. Louis Reorganization

J. K. Newman of New York and New Orleans, who helped to bring about the formation of the St. Louis Public Service Company and the termination of the receivership of the United Railways, has been subpoenaed to appear before the Missouri Public Service Commission in connection with the application of the City & Suburban Utility Company of Delaware to purchase and retain a larger block of the stock in the railway. Mr. Newman will be asked to explain what services the holding company proposed to extend to the street car system and the charges to be imposed for this service, and any other information that may shed light on the relations that would exist between the railway and the holding corporation.

Former Judge Henry S. Priest of St. Louis, as counsel for certain minority stockholders, has opposed the application of the City & Suburban Utility Company.

September 1928-1927 in Rhode Island

A net income for September slightly higher than that received in August, but almost 50 per cent lower than that taken in during September of last year, was reported recently by the United Electric Railways, Providence, R. I. The net income for last month was $24,-429, compared with $21,762 for the month previous and $45,182 for September, 1927. For the nine months ending Sept. 30, 1928, the net income was $359,-185, an amount $13,148 below the figure reported for the corresponding period last year. Total operating revenue and total operating expenses for September each show a slight decrease compared with revenue and expenses for the similar months in 1927.

Lower Net Income in Brooklyn

For the three months ended Sept. 30, 1928, the total operating revenue of the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., was $11,851,025 against $11,691,318 for a similar period of last year. Total operating expenses increased from $7,914,744 to $7,978,219 for this year's period. After the consideration of total income deductions a net income remained of $1,231,591 in 1928 against $1,270,608 for the three months' period ended Sept. 30, 1927.

Purchases Stock of California Company

The Pacific Electric Railway, Los Angeles, has applied to the California Railroad Commission for authority to purchase all of the outstanding capital stock of the Pacific Coast Motor Coach Company, amounting to $45,000. The coach company has operated motor coach service as an auxiliary of the Pacific Electric Railway under the same management.

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Seattle-Tacoma Interurban to Abandon Service

Interurban service between Seattle and Tacoma over the line of the Puget Sound Electric Company, and between Seattle and Renton, over the Renton branch of the company, is scheduled to cease on Dec. 30. An order to that effect has been signed by Judge Edward E. Cushman in United States District Court at Tacoma. Judge Cushman also set Nov. 26, as the time for a hearing at which he will fix the date for sale of the property.

Under the order, representatives of receiver Scott Z. Henderson and the Old Colony Trust Company, trustee for the holders of bonds, must appear at this time. The court ordered copies of the order served on the Governor, the Attorney General and the Department of Public Works, so that ample time may be allowed in which to protest the discontinuance.

The order to discontinue the line's service follows operation of the system for several years at a loss. The book valuation of the line as given in the receivers' report was $5,777,365, but the report of the appraiser, Henry L. Gray, placed the actual valuation at $489,541.

Lower Assessment on Railway Property in Missouri

The Missouri State Tax Commission and the State Board of Equalization have fixed the final valuation for taxes in 1928. Street railway property is assessed at $63,485,552, a decrease of $4,601,973.

The St. Louis Public Service Company is assessed at $45,614,269, compared with $47,348,250 in 1927, while the Kansas City Public Service Company must pay taxes on $12,010,224, compared with $14,598,104 in 1927. The McKinley Bridge of the Illinois Traction System at St. Louis is assessed at $970,757.

Personal Items

L. N. Spears Handles Legal Matters in Tennessee

Lawrence N. Spears, appointed attorney recently of the Tennessee Electric Power Company, Chattanooga, Tenn., is supplementing the work of the present attorneys of the company in the continued expansion of the company serving new communites and adding to its facilities. Considerable work of a legal nature is involved in the acquisition of easements, rights-of-way and purchase of property. His office and department will be a "clearing house" and all local managers, attorneys and employees are expected to co-operate with the new department and keep it informed on suits and proceedings filed against the company. In reality Mr. Spears is not new with the Tennessee Electric Power Company. He represented that company during the building of the Hales Bar lock and dam. Upon his graduation from Cumberland University Law School at Lebanon, Tenn., 25 years ago he opened law offices at Jasper, Tenn., with his father. Eighteen years ago they moved to Chattanooga, maintaining law offices in that city until recently.

Herbert Clark Hoover Honored

The John Fritz Gold Medal, the highest honor bestowed by the engineering profession of this country, has been awarded for 1929 to Herbert Clark Hoover. According to the announcement by Alfred D. Flinn, director of the Engineering Foundation, the choice of Mr. Hoover ended a process of selection begun a few years ago. The board sought to express the appreciation of Mr. Hoover's professional brethren for his distinguished attainments as an engineer, particularly in mining operations in this and other countries, and his great service as a man to his fellows.

The award was tentatively made a year ago by the John Fritz Medal Board, which is composed of sixteen recent past-presidents of the four national societies of Civil, Mining and Metallurgical, Mechanical, and Electrical Engineers, having together a membership of nearly 60,000.

The citation accompanying the award reads:

"To Herbert Hoover, Engineer, Scholar, Organizer of Relief to War-Stricken Peoples, Public Servant."

The medal, a memorial to the late John Fritz of Bethlehem, Pa., long a leader in the American iron and steel industry, will be presented to Mr. Hoover at the annual meeting of the American Institute of Mining and Metallurgical Engineers in the third week of February next in New York.

During recent years Mr. Hoover has been made an honorary member for life of the American Society of Civil Engineers, the American Institute of Mining and Metallurgical Engineers, and the American Society of Mechanical Engineers.

This is the 25th award of the John Fritz Medal. The first was to John Fritz, in 1902, in celebration of his 80th birthday.

LEO N. BLAGOVESCHENSKY was recently appointed assistant general engineer of the Georgia Power Company, Atlanta, Ga. He was formerly connected with the Mexican Light & Power Company, Mexico City.

W. D. SHANNON of Seattle has been elected superintendent of construction by Stone & Webster for the new $5,000,000 steam power plant to be built by the Puget Sound Power & Light Company on Lake Union. Mr. Shannon recently had charge of construction of the hydro-electric plant on Baker River for Stone & Webster, who built it for the Puget Sound Power & Light Company.

JOHN V. STRANGE, operating manager of the Carolina Power & Light Company, Raleigh, N. C., and in charge of bus operation, has been appointed a vice-president of that utility. Mr. Strange has been connected with the public utility industry in the East for only four years, having spent the early years of his engineering career in the West. He has been affiliated with the Portland Gas Company and the Pacific Power & Light Company, becoming assistant general manager of the latter company with headquarters in Portland, Ore. He relinquished his duties in Portland in 1924 and went to Raleigh. The Carolina Power & Light Company operates more than 35 miles of electric railway.

FRANK H. MILLER, vice-president of the Louisville Railway, Louisville, Ky., has been appointed a member of the city planning and zoning commission by Mayor Harrison. He succeeds Ernest Horn, who resigned because no longer eligible to the commission on account of being a member of the Board of Councilmen.

OBITUARY

JOHN FOGARTY, chief dispatcher of the Chicago, South Shore & South Bend Railroad, Michigan City, Ind., died on Oct. 14. He started his career as a telegraph operator on a steam line and after serving for a time with the Chesapeake & Ohio was appointed dispatcher for the South Shore line two years after this railroad had begun operation as the Chicago, Lake Shore & South Bend Railroad. Mr. Fogarty was 49 years old.

W. L. BURNHART, manager of the publicity department of the National Surety Company, with which he had been connected in New York and Philadelphia for ten years, died in Englewood, N. J., on Oct. 23. An address of Mr. Barnhart, "Combating the Present-Day Criminal" delivered before the Accountants' Association at the convention of the American Electric Railway Association in October, 1927, revealed the results of a special survey of the principal causes of loss in the electric railway field conducted by his company. For many years Mr. Barnhart had been making a study of crime conditions. He was a frequent contributor to *System, Forbes Magazine, Printer's Ink, Sales Management, Success* and similar publications. He was 45 years old.

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Track Projects Provide Continuous Market

Several new projects are planned. Pacific Electric improvements are approved. Public Service silences cars

ALTHOUGH orders for material and equipment have apparently diminished in both quantity and unit volume, numerous construction projects permit no indication of an unusual slackening market. The Reading Transit Company, Reading, Pa., is engaged in constructing an entirely new track on South Fifth Street between Spruce and Bingaman, which is a continuation of the new track construction made earlier in the season. The track now being installed includes new ties, heavier rails, welded joints, a concrete foundation, and asphalt paving. Approximately $75,000 was spent this year for track construction by this company.

The Portland Electric Power Company, Portland, Ore., has ordered 5,000 tie plates, 200 poles, and two carloads of wire. Four Chicago-Pneumatic type MM back fill tampers were included in the track construction equipment ordered by the Washington Railway & Electric Company, Washington, D. C.

Track Projects Contemplated

The Dallas Railway & Terminal Company, Dallas, Tex., contemplates the purchase of 4,000 pine ties. The City Utilities Committee of the Seattle City Council, Seattle, Wash., has instructed George D. Avery, superintendent of public utilities, to confer with the Citizens Transportation Committee, relative to the construction of an extension of the Beacon Hill car line. Provided this line is extended up Beacon Avenue to Columbian Way, property owners of that district have offered to absorb the discount on street car utility bonds, to finance the construction. The extension will be between ½ mile and 1 mile in length, depending upon which route is chosen.

Springfield Street Railway Company, Springfield, Mass., has petitioned for permission to relocate tracks in connection with a street widening program. The petition asks that the street railway be allowed to relocate tracks from Benton Lawn to conform with the city's terrace plan. The petition was taken under advisement and no opposition is expected.

The Pacific Electric Railway Company, Los Angeles, Cal., has placed orders with the Union Switch & Signal Company for alternating current block signaling materials to be installed between Valley Junction and Ramona, Cal., comprising seventeen color light signals, 31 impedance bonds, 19 track relays, 27 transformers, and accessories.

The St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., has finished one block of new track work at Park Place and is now planning to install new track on Sixth Street from Edwin to Francis Streets. The San Antonio Public Service Company, San Antonio, Tex., has completed the work of reconditioning its track on Easton Street. Seven-inch 103-lb. rail were laid, and the old wood block paving was replaced with asphalt. The cost of this construction was $18,574.50.

British Columbia Electric Railway, Vancouver, British Columbia, is building a number of spur tracks from its main line to various industrial plants. One of the most important of these tracks is 2,000 ft. in length, to the Sumas reclamation area. Saskatoon Municipal Railway, Saskatoon, Saskatchewan, is laying a second track on a number of its lines. The length of these tracks are 1,800 ft., 1,300 ft., 1,200 ft., of which 400 ft. is being laid in concrete, and 900 ft.

The Cleveland Union Terminal Company has been receiving bids for the erection of a signal tower in the new terminal development at Cleveland, Ohio. This company has also awarded a contract for the steel work in connection with track elevation at East Cleveland.

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., plans to construct tracks, bridges, and a subway for the new Menominee Valley short cut to the west side of the city. However, construction cannot be started until the complete right of way is acquired. Application has been granted by the Wisconsin Railroad Commission to construct the tracks.

Cars and Buses

The Public Service Co-ordinated Transport, Newark, N. J., has completed a test car in which an attempt has been made to eliminate noise. The changes made in this car will be applied to all of the 2,500 cars in the system as soon as possible. It is expected that this work will be completed within a year.

Washington Railway & Electric Company has ordered seven 31-in. steel wheels and fifty 33-in. steel wheels.

The Northwestern Pacific Railway, San Francisco, Cal., has been inquiring for five electric cars and five electric trailer cars.

The Illinois Power Corporation, Chicago, Ill., has received a 230-in. wheelbase A. C. F. parlor coach.

The Los Angeles Railway Corporation, Los Angeles, Cal., has ordered three 6 cylinder street car type Fageol coaches.

Washington Railway & Electric Company has ordered four type Z 29-passenger coaches from the General Motors Truck Company, and the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., has received one A.C.F. urban coach.

New York Railways Corporation, New York, has filed plans for the construction of a two-story motor bus garage, and repair building, at Lexington Avenue and 100th Street, New York City. This building will cost about $100,000, including the equipment. The Baltimore & Ohio Railroad has made plans for a group of electrically operated pumping stations. A new one-story car and locomotive repair shop at Tiburon, Cal., to cost $45,000 with equipment is planned by the Northwestern Pacific Railroad, San Francisco, Cal.

In connection with its electrification plans of a portion of its suburban system from Hoboken to Dover, N. J., the Lackawanna Railroad, New York, has secured property on the Hackensack River, and is considering the construction of a steam operated electric generating plant, to cost about $4,000,000.

Toledo to Buy Buses

Community Traction Company, Toledo, Ohio, ordered six 33-passenger White buses following tests made recently. Additional buses will be purchased following completion next month of a garage holding 150 buses. It is expected that the White Motor Company will obtain a contract for the majority of buses needed.

New Cars for Los Angeles

Los Angeles Railway, Los Angeles, Cal., coincident with its 7-cent fare rate has announced through its president, G. J. Kuhrts, that 65 new cars are to be placed in service immediately. This will bring the total number of cars in service to between 870 and 875 during the peak hours. It was further stated that new cars of the multiple type are being built and are soon to be put in service.

Additional Pacific Electric Improvements Outlined

Work orders calling for the expenditure of a sum aggregating $77,682, were approved by the Pacific Electric Railway, Los Angeles, Cal., during the month of September, covering improvements and betterments at various locations over the entire system. The work will be done as early as possible.

On Sunset Boulevard between Echo Park Avenue and Glendale Boulevard, the railway will reconstruct and pave outbound track, renew present 72-lb. construction with 128-lb. grooved girder rail; install treated ties, tie plates; renew crushed rock ballast and pave with asphalt concrete pavement, at an estimated cost of $9,691.

On West Sixteenth Street from Figueroa to Georgia Street, it is planned to reconstruct and pave tracks, renewing

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present 72-lb. construction with 128-lb. grooved girder rail construction; install treated ties and tie plates, renew crushed rock ballast and asphalt concrete pavement, estimated cost $7,904.

On Sixth Street, from Los Angeles to Broadway the company will reconstruct and pave approximately 2,213 feet equivalent single track, replacing present 72-lb. construction with 128-lb. grooved girder rail construction, renew crossover and turnout, diamond and curve at northeast corner at Sixth and Main Streets; replace redwood with treated ties, renew crushed rock ballast and asphalt concrete pavement, at an estimated cost of $30,131.

Pacific Avenue Loop, Long Beach, will be reconstructed and paved to the extent of 689 ft. equivalent single track and shift 40 ft.; also shift track from 11½-ft. to 12-ft. centers between Ocean Avenue and First Street. Sixty pound and 72-lb. construction will be replaced with 128-lb. grooved girder rail construction; replacing redwood with treated ties, and gravel with crushed rock ballast; 7-in. asphalt concrete with 8-in. asphalt concrete pavement, at an estimated cost of $9,093.

In order to conform to improvements being made by municipalities the following street crossings will be improved:

On San Pedro Lumber Company Spur, Long Beach Line, Los Angeles, the railway will reconstruct and pave tracks serving the San Pedro Lumber Company across Compton Avenue and across first alley west of Compton Avenue, replacing present 60-lb. construction with 128-lb. grooved girder rail construction, redwood with treated ties, installing crushed rock ballast and 7-in. asphalt concrete pavement, the cost to be about $1,621.

Myrtle and Olive Avenues, on the Monrovia Line, Monrovia, Cal., it is planned to replace present 75-lb. construction with 128-lb. grooved girder rail construction, replace redwood with treated ties, oil macadam with asphalt concrete pavement; remove and replace automatic flagman; install rail top concrete culvert and make changes to existing culvert, etc., estimated cost $2,874.

In order to avoid hazard of accident and to improve operating conditions it is planned to renew the following special work:

At Delta Station, Vermont Heights line the company will replace present 70-lb. with 75-lb. C.S.R. split switch turnout; install 100 additional 75-lb. tie plates, at an estimated cost of $1,038.

In Gardena, on the Watts-Redondo line present 60-lb. A.C.S.E. will be renewed with 75-lb. C.S.R. split switch turnout; renewing tie plates, estimated to cost $922.

At Pacific Electric-Southern Pacific Station, San Bernardino, it is planned to renew a single track turnout and curve on connection from the San Bernardino-Colton line on Third Street into station grounds; replace present 72-lb. material with 93-lb. and 128-lb. material; renew gravel with crushed rock ballast and redwood with treated ties, at an estimated cost of $3,037.

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

	Oct. 23, 1928
Metals—New York	
Copper electrolytic, cents per lb.	15.275
Copper wire, cents per lb.	18.125
Lead, cents per lb.	6.5
Zinc, cents per lb.	6 60
Tin, Straits, cents per lb.	48.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.40
Somerset mine run, f.o.b. mines, net tons	1.90
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.375
Central, Ill., screenings, Chicago, net tons	0.675
Kansas screenings, Kansas City, net tons	1.875
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.3
Weatherproof wire base, N.Y., cents per lb.	18.625
Cement, Chicago net prices, without bags	2 50
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10 5
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal	$0.5925

Track Projects in Dallas

Approval by the City Commission of the purchase of fifteen blocks of right-of-way on the Vickery car line by the Dallas Railway & Terminal Company, Dallas, Tex., from the Works-Coleman Land Company, for $10,000, opens the way for expenditure of $56,000 by the street car company in improving the line.

Under Everman plan No. 5, the street car company is to spend the $56,000 from reserves, in the year ahead, double-tracking and paving trackage on the Vickery line. Just when this work will begin has not been determined.

The next large project contemplated under the plan is the double-tracking and paving on Cole Avenue, from Lemmon Avenue to Knox Street — work which will cost the company $109,795. This probably will be delayed for six or eight months, until storm sewer and street structural work contemplated by the city street department is completed.

Detroit Car Order Restrained

The Cummings Car & Coach Company, Chicago, Ill., has obtained a temporary injunction restraining the city of Detroit, Mich., from contracting to purchase 100 street cars from the Perley A. Thomas Car Company, High Point, N. C., after the Council had unanimously decided to award the contract to the Thomas company. It is alleged that the charter had been violated when the Thomas company was permitted to change its bids after all bids had been opened. The circuit court has set the hearing on legality of contested bid for Oct. 27.

Weekly Business Conditions

The volume of business during the week ended Oct. 20, as seen from data on check payments, was greater than in the previous week but showed a small decline from the same period of last year, according to the weekly statement of the Department of Commerce. Activity in steel plants, though showing no change from the high level of the previous week was considerably higher than in the same period of last year. Prices for iron and steel continued to show further slight recovery, reaching for the first time this year, the level which prevailed a year earlier. Prices for copper were stronger than in either the previous week or the same period of last year.

The value of new building awards during the week showed a higher daily average than in the previous week, but was lower than in the same period of last year. Bond prices showed a slight gain over the previous week but were lower than last year. Interest rates for time funds showed a decline from the previous week but were higher than a year ago. Call loan rates, however, showed no change from the previous week, but were higher than last year. Stock prices averaged higher than in either the previous week or the same period of 1927.

The production of bituminous coal during the week ended Oct. 13 showed gains over both the previous week and the same week of last year. Petroleum production, though showing a decline from the previous week, was greater than in the same period a year earlier.

WEEKLY BUSINESS INDICATORS
(WEEKS ENDED SATURDAY. AVERAGE 1923–25 = 100)

	1928			1927		
	Oct. 20	Oct. 13	Oct. 6	Oct. 22	Oct. 15	Oct. 8
Steel operations	115.8	115.8	113.2	84.0	87.0	86.0
Bituminous-coal production	.....	115.7	*113.3	105.5	108.3	105.5
Lumber production	.....	90.9	90.9	105.5	106.4	108.6
Petroleum production (daily average)	.....	120.3	121.2	119.2	119.7	121.3
Building contracts 37 states (daily average)	135.7	134.3	180.6	152.0	115.1	117.6
Price iron and steel composite	85.9	85.6	85.3	85.9	85.9	87.1
Copper, electrolytic, price	.....	108.7	108.7	93.5	94.2	93.5
Interest rates, call money	157.6	157.6	178.8	93.9	97.0	100.0
Interest rates, time money	155.3	165.7	165.7	100.0	97.1	100.0
Federal reserve ratio	86.8	87.2	89.5	96.9	96.8	96.6

*Revised.

To Lecture on Welded Buildings

A lecture tour covering a large part of the United States is soon to be made by Professor Frank P. McKibben, well-known consulting structural and bridge engineer, in response to invitations from various societies throughout the country. The lectures, during the winter months, will be on the application of electric arc welding to the noiseless construction of buildings, based on the experience of the General Electric Company and other pioneers in this field who have erected a number of these structures.

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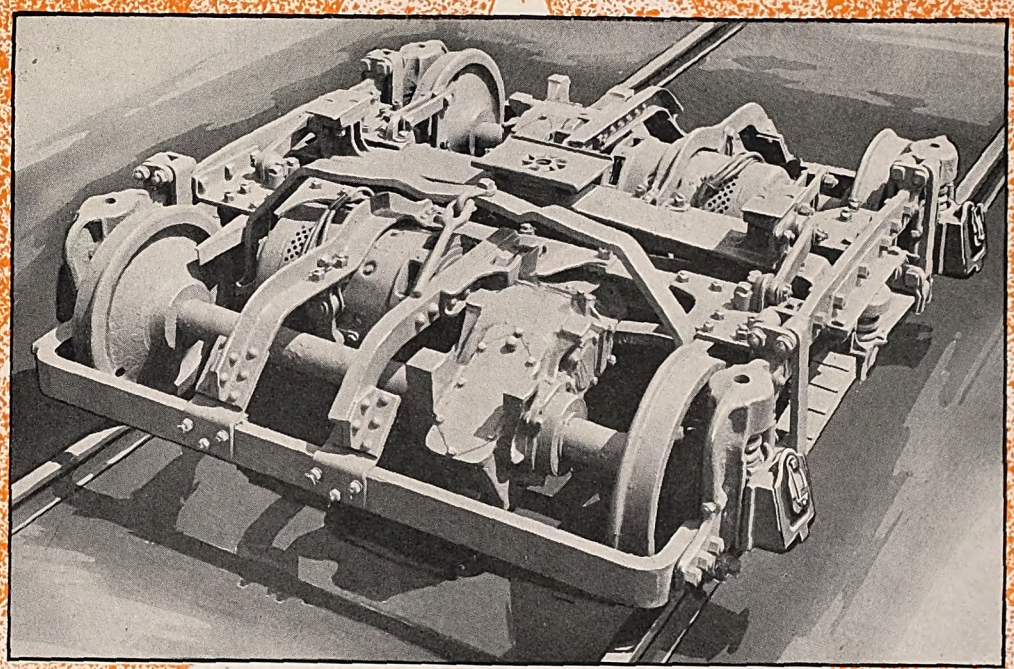

Brill 177-E Trucks Under the
Monongahela-West Penn Car

Wheel Diameter—22 Inches

The wheels of the Brill 177-E Trucks under the Monongahela-West Penn Car are twenty-two inches in diameter. This permits the car floor to be lowered to 29-5/16 inches above the rail and gives the car a lower and more attractive appearance.

As in the Brill 1928 Model, noise reduction is accomplished by the use of quadruple 35 Hp. high-speed motor equipment and the W-N gear drive units which operate in oil. The entire weight of the motors is spring supported.

Brill Twin Links convert this type truck to high speed service while Brill Automatic Mechanical Slack Adjusters provide greater braking efficiency.

Much of the enthusiasm created by the Monongahela-West Penn Car was due to the 177-E trucks on which the car is mounted.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.
Pacific Coast Representative: Rialto Bldg., San Francisco

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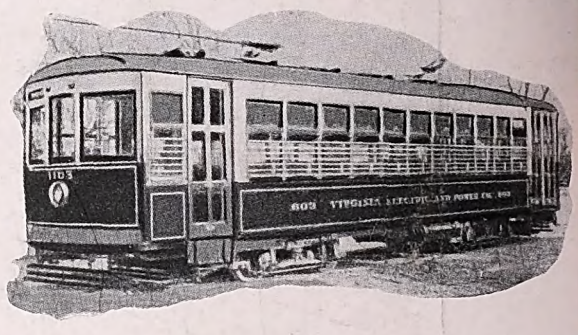
HASKELITE



An Unbroken Record

Another— HASKELITE user wins Coffin award

ALL of the electric railway companies that have won the Coffin Award since it was first offered in 1923 have been users of HASKELITE, or PLYMETL, or both.

That is to be expected, for the light weight, strength, and fine appearance of these materials contribute much toward the economies necessary to win the award.

Send for our valuable blue print booklet of street car and bus applications.

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Railway & Power Engineering Corp., Ltd.
Montreal, Toronto, Winnipeg, New Glasgow

PLYMETL

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ELECTRIC RAILWAY JOURNAL

Graw-Hill Publishing Company, Inc. NOVEMBER 3, 1928 Twenty Cents Per Copy

One of the Automotive Transportation Company's fleet of 81 White Busses, operated by Newport and Providence Railway.

"Our Revenue Increased Substantially"

—says William H. Vanderbilt

"When, in August, 1927, we put into operation six White six-cylinder busses," writes William H. Vanderbilt, president of the Automotive Transportation Company, Inc., New York, "the enthusiasm created was such that our revenue increased substantially and the riding public was so pleased with them that we found it necessary to obtain four more that same year and later, when it was necessary to render special de luxe service, we naturally purchased three more Model 54 Whites.

"We operate in various localities in New England, and the conditions are so different that it is a satisfaction to feel that it is possible to use our 54's anywhere and be assured that they will perform satisfactorily. We operate these coaches about 5,000 miles per month and to date, at an average of 45,000 miles, we have had no major repairs or replacements.

"Since operating the White Six we find it less difficult to maintain our schedules, as gear shifting on grades is practically eliminated and it is a very rare occasion when second speed is resorted to, thus allowing an even, steady speed.

"We have occasional reports from our operators to the effect that they frequently meet other sixes of other makes, and without exception they all agree that they can out-perform them under any conditions."

THE WHITE COMPANY, *Cleveland*

WHITE BUSSES

FOURS and SIXES

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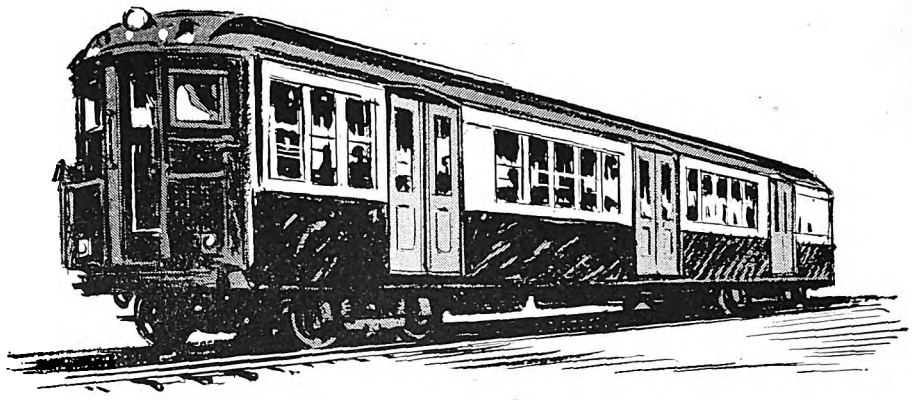
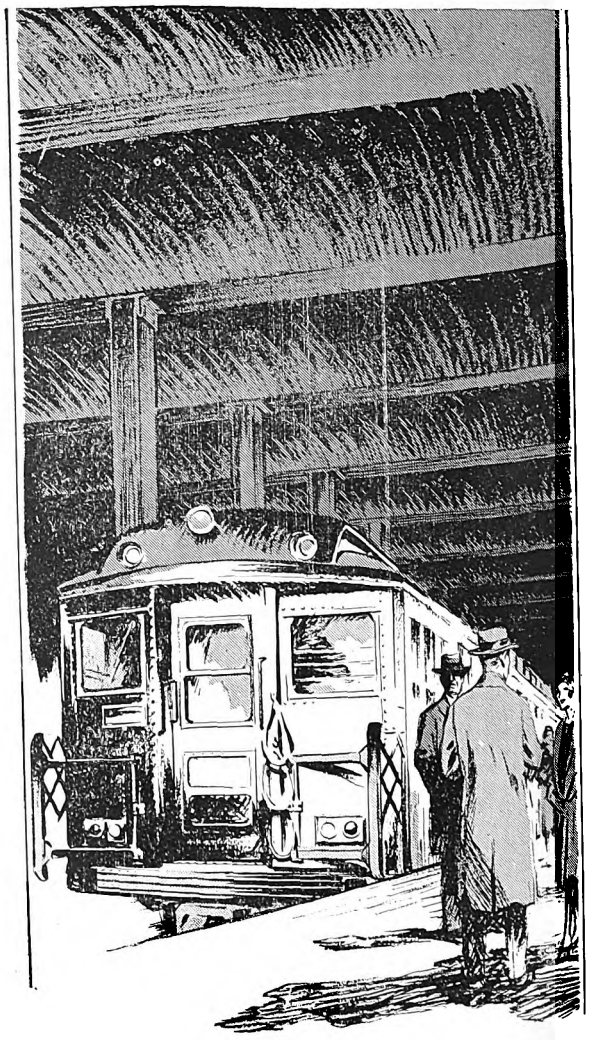


Home-
a half hour sooner via Broad Street Subway



WHEN the City of Philadelphia recently opened its new Broad Street Subway for revenue service, the northern limits of the City were virtually moved a half hour closer to the City Hall.

Commuters from this outlying section now reach their homes thirty minutes sooner by using this new subterranean avenue of transit.

Philadelphia's streets have been widened, by this surpassing facility, not by an actual increase in width, but through increased capacity to accommodate growing surface traffic requirements.

Westinghouse feels a pride in having supplied the 312 motors—64,000 horsepower, control equipment, switch panels, ventilating fans and battery-charging devices for the 150 cars that under the skillful and progressive Mitten Management are now saving many thousands of hours daily for Philadelphia's metropolitan population.

MEMBER AERA 1923

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, *President*

Consolidation of Street Railway Journal and Electric Railway Review
CHARLES GORDON, *Editor*

LOUIS F. STOLL,
General Manager

Volume 72 New York, Saturday, November 3, 1928 *Number 18*

Can the Public Understand the Facts?

IN THE Omaha newspapers last week there appeared full-page statements by the Omaha & Council Bluffs Street Railway outlining the company's position with reference to its toll bridge which links the two cities. Agitation for a free bridge is not a new thing in Omaha or in Council Bluffs, but its injection into the franchise negotiations can be credited largely to Senator Howell of Nebraska, who apparently would seize what appears to be a golden opportunity to wrest political advantage from an already difficult situation.

In President Shannahan's explanation of the intricate details of the bridge ownership by the Council Bluffs company and its leasing by the Omaha company, the complete story of the bridge lease, the financial set-up of the Council Bluffs company, the obligations of the Omaha company, the financial service performed by the toll bridge for both cities, and the effect upon Omaha and Council Bluffs of a competing non-toll bridge are clearly detailed. It is very frankly the intent of this message to enlist the sympathetic comprehension and support of the citizens of both cities in finding a satisfactory solution to a situation which is in no wise the creation of the present management, yet threatens now to jeopardize the granting of a new street railway franchise without which the Omaha & Council Bluffs Street Railway cannot continue to render efficient transportation service.

Threatened more or less seriously with a proposal by some citizens that Omaha and Council Bluffs co-operate to build a free bridge, the street railway officials are very wisely taking the public into their confidence, openly publishing the facts in the case, and asking for a square deal. The clear-cut, frank explanation of the position of the company and its attitude must commend it to every thinking citizen. The Omaha company has expressed clearly its willingness to co-operate to the fullest extent in effecting an arrangement which will be satisfactory to the public it serves. "We trust the public," declared Mr. Shannahan. "While we are aware of its desire for a non-toll bridge, we also have confidence in the public's intention to be fair with us. We believe that the public will be willing to pay for the bridge on its fair and just value. We likewise believe that the public will be willing to have this value determined in an impartial manner."

Here again is an expression of confidence in the attitude of the American public. Whether or not the public in Omaha will in this instance deal fairly with its railway, only time alone will tell. Usually the man on the street has been handicapped by lack of facts. Here, however, he has the facts; clearly, openly and succinctly stated. The question is not one of the fairness of the public. It is instead a question of whether the public is able and willing to deal with facts and to detect in the glittering promises of those who seek to strike a popular chord by promising something for nothing, the hidden motive of personal advancement at the taxpayer's expense.

Co-ordinating Building Development with Transit Facilities

LITERARY license is the right of Deems Taylor. Still it came as a surprise to discover the editor of *Musical America* and the composer of the music of "The King's Henchman" writing for *Vanity Fair* an article "The City That Died of Greatness." He is an alarmed New Yorker who discusses what the skyscrapers are doing to his home town. Imaginative artist that he is, Mr. Taylor closes by indicating that perhaps the best thing to do after all would be to wait ten years until New York is so hopelessly congested that no one can move at all. The population will then migrate in a body, and New York can be set aside by the government as a national park—the city that was so prosperous nobody could afford to buy real estate; that was such an ideal place of business, nobody could transact any business; the metropolis so greedy for population, it choked itself to death.

Mr. Taylor points out that however fast new subways may be built, the skyscrapers outstrip them so that a new line is jammed beyond its theoretical capacity almost as soon as it is opened. This, of course, is not a new observation. Best of all, Mr. Taylor takes a shot at the Babbittry which always supplies the optimistic note by proclaiming that a way will be found to solve this and other problems arising from the magical development of skyscraper districts such as that best or worst evidenced in New York, but with its counterpart in nearly every other city of first magnitude today. But the thing which Mr. Taylor fails to point out, and it was not to be expected that he would do so, is that no one has taken the trouble to find the basic economic laws that lie at the root of the whole traffic and transportation evil.

That the problem is primarily an economic one is almost self-evident. No one will dispute the possibility of providing sufficient transit facilities if the necessary money were available. And the sad part of the whole situation is that this lack of funds is more apparent than real. It is not attributable to lack of resources, but to failure to put the transit load where it belongs. Take for example the very problem presented by the transportation requirements of the skyscrapers referred to by Mr. Taylor. Why limit their height? In order that population density may be held down to the capacity of subways built with public funds? Let's examine that for a moment.

Why impose an artificial restriction on the development of property through an arbitrary building height

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limit when the same result can be accomplished with far better economic balance through permitting natural economic laws to exert their influence? An arbitrary building limit tends to hold down property value through limitation in the allowable intensity of use of the land upon which the building stands. There is nothing the matter with this as a point of equity, if it becomes necessary to the welfare of the community. But what is the proper allowable building height limit? There the controversy starts, and there the policy of limiting building heights breaks down at its weakest point. Would not the same ultimate result be achieved without a building restriction, by assessing as a property benefit the cost of providing sufficient rapid transit capacity, whether the requirement be one level, two levels or even more? If the construction cost of providing sufficient transit facilities to serve these modern skyscrapers were put where it belongs—on the property which makes these facilities necessary—would not this financial load serve as an automatic check on the height of buildings that would be erected? And is this method not preferable to that of arbitrarily limiting building heights, since it permits the free action of natural economic forces and thereby permits a proper economic balance to be reached between building heights and transit facilities?

Obviously, the subject is too involved to be exhaustively presented here. But engineers in every large city that have given serious thought to the fundamentals of rapid transit economics are almost a unit in agreeing that the special assessment principle is the only sound method of financing rapid transit. It is doubtful, however, if there is any general conception among those who have not studied the subject thoroughly, of how far-reaching would be the effect of the application of this principle in relieving many phases of the transit problem that clamor for solution in every metropolitan community.

To revert to Mr. Taylor, he sees the skyscraper as another proof of the fact that man's cleverness is generally far in advance of his intelligence; that his ingenuity in devising new instruments of civilization is by no means always accompanied by the resourcefulness or imagination needed to handle them intelligently. The quarrel is not with the skyscraper, but with the lack of vision displayed in co-ordinating building development with transit facilities.

Under the Pressure of Necessity a Broader Vision Is Born

SOME few months ago the attention of those who follow the sophisticated pages of the *American Mercury* was called to the plight of "The Troubled Trolley." With gentle irony the author poked a little harmless fun at the ballyhoo and the seeming loud whistling within the local transportation industry to keep up its courage. But he failed to point out that the troubles of the trolley are merely surface reflexes of the terrific struggle of the modern American community itself, to avoid strangulation from a simultaneous overdose of skyscrapers and automobiles.

To the credit of the trolley may it be said there is every evidence today that leaders of thought in the industry are looking for the solution of their troubles, not so much to palliatives and expedients to give temporary relief, but to a broad understanding of the relation between transportation service and community development. In that they are endeavoring to serve not only their own best interests, but the interests of American communities, with the welfare of which their own destinies are inseparably linked.

No thinking man can read the article by President J. P. Barnes, printed elsewhere in this issue, without being struck by the breadth of the approach which is being made to the transportation and traffic question by those who see in this outstanding problem of the community, an opportunity for the transportation man to play his part as a public servant in the highest sense of that term. To those immersed in the routine of daily detail who may be inclined to scoff at this as merely ballyhoo may it be said that the program of fundamental research outlined by President Barnes is already much further under way than may perhaps be realized by those who have not followed closely the course of the association's activities during the past few years. Mr. Barnes gives the reader merely a glimpse of what is going on in the minds of the men who are thinking beyond the present and looking toward the future. But in that mere glimpse there is unmistakable evidence that the pressure of necessity is leading transportation men to more fundamental thinking and a broader vision.

A Major Extension of Electrification

INTIMATIONS have not been lacking in the past that big things were in prospect on the Pennsylvania system in the realm of future electrification, but the public and the engineering fraternity were hardly prepared for a program of the magnitude indicated in the announcement made by the company on Thursday morning and outlined elsewhere in this issue. The extent of the work now authorized, covering more than 325 miles of line and 1,300 miles of track, and the fact that the single-phase system is to be used are the outstanding features of the announcement. The first of these makes the proposal the biggest of its kind so far to be attempted since the Milwaukee electrification. The second represents an extension of that form of propulsion used on the Pennsylvania's suburban lines operating out from Philadelphia as well as on the section of main line between Philadelphia and Wilmington, just recently completed.

Among the reasons given for the change is increase in track capacity through the more expeditious handling of trains. This is deeply significant. For passenger trains it means smoother and more comfortable operation and fewer switching movements. For freight trains it means higher speed, a most important gain in the case of perishable freight and one which under electric propulsion should open up new markets for fruitstuffs—a service that should gladden the South to the tips of the Florida Keys.

More than likely the intimate information about the project will soon be divulged and will be of the greatest interest to the railroad technician, both mechanical and electrical, but the facts so far made public are significant in the light of what they portend generally. In that the proposal is intended among many other things to anticipate the service requirements of a metropolitan community of 30,000,000 people extending into Pennsylvania Railroad territory from New York as far south as New Brunswick, it reflects the discounting of time by a management that has been unusually wide awake to its opportunities and obligations.

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Practical Planning for the Future

IT IS just as important for the management of every large business corporation to plan for the future as to carry on current operations. Community transportation is no exception to this rule. Fortunately, it is much easier to do this now than it was a few years ago, because the place of the bus is much better defined. The principles governing the determination of a proper fare are also more thoroughly understood. Experience has shown in the first place the necessity of co-ordinated service. In the second place, it has taught the need of a flexible fare—one which will change with the cost of producing the transportation.

On many properties the present is a period of readjustment, during which both of these matters can well be considered. The present, then, is pre-eminently the time for preparing for the future. An example of such constructive planning is shown by the San Antonio property, in an article in this issue. Before the advent of the bus this company's trolley lines gave both a city and suburban service on a flat fare, but left considerable areas within the city unserved. Then came the bus with its potential danger as a competitor but with great possibilities if co-ordinated with the electric car service. It was to the latter usage that it was applied in San Antonio, i.e., to supplement the local electric cars and also to give a special suburban express service. To carry out this plan some electric track was abandoned, and car operation was confined to the area within a 3-mile radius from the center of the business section. Within this district a flat fare is charged. The higher fares for the longer rides on the buses are collected on the zone system. This means that as the length of run increases with the growth of the city, the fare can keep pace with the longer rides given.

In too many cities in this country transportation has had a haphazard growth. Definite city planning, particularly as to transportation, has been almost unknown. As a result development and expansion have frequently brought an increasing burden in the form of rising costs, with no corresponding provision for added revenue. In a growing community there is a constant pressure for the extension of transportation lines, sometimes into comparatively thinly populated areas. The very flexibility of the bus, which constitutes perhaps its greatest advantage as a transportation tool, opens wide the door to this pressure for extensions to thin territory. Only through the establishment of broad policies which will anticipate the future as well as provide for the present, can there be assurance of orderly growth and permanent stability.

Uniform Interpretation of Accidents Needed

WITH the increased traffic which our city streets are being called upon to handle there has developed, as was inevitable, a constantly increasing liability to accidents involving street cars, vehicles and pedestrians. Concurrently, these accidents have become more and more diversified in character—with more elements of the unusual entering into their happening.

Many companies are undertaking to keep extensive accident records, including the assigned causes, with a view to developing preventive measures from an analysis of these data. Much good work has been accomplished by this process. The interest and co-operation of platform men on many properties have been enlisted in the cause of safety. Electric railways have established a record that has earned the street car the right to be called the safest place on the street. But despite all of this, the hazards of constantly growing congestion and higher-powered motor cars demand still greater alertness and attention to accident prevention measures on the part of those charged with the management of public transportation systems.

Comparison of the performance of several electric railways of the same general characteristics and size offers a means of directing attention to the need for still further reducing accidents on some properties. But to accomplish this there is need for a more uniform plan of reporting and recording accident statistics. The fault does not lie with a lack of a standard classification for accidents. Such a classification, with fourteen main heads and many subheads, was adopted in 1916 at a joint meeting of the Claims and the Accountants' associations. But occurrences which would be considered accidents on some properties are not so designated on others. Furthermore, the determination of chargeable and non-chargeable accidents for the purpose of classification and record keeping is subject to wide variations in interpretation.

"Wanted—A Horse Car"

"WANTED, a horse car of former days, with or without running gear, with clock and stove, if possible." Thus read an advertisement in the Oct. 6 issue of ELECTRIC RAILWAY JOURNAL. The purpose to which the old car, if acquired, is to be put was not disclosed, but a guess may be hazarded. As the running gear is not considered essential, it is evident that the car is not to be used for the transportation of passengers, or even for exhibition. The proposed purchaser is not inspired to preserve this relic in its pristine condition for the benefit of posterity. He is not a Henry Ford. For either of these purposes, wheels are essential. Evidently this chariot of former days is to be still for the remainder of its life, after the new owner comes into possession of it.

However, the latter part of the advertisement offers a clue to the purpose of the advertiser. "With clock and stove, if possible." These would not be needed unless the car is to be used as a habitation of some kind, though not necessarily one for human beings. Fancy can easily picture it mounted on sturdy posts, some distance from the residence of its owner, and used perhaps as a playhouse for his children or grandchildren. Then again, it would make an excellent watchman's shanty, and both the stove and clock would be useful. As a kennel or chicken house one might find reasons for the stove but would be at a loss to explain the specified clock.

Old cars are very well suited for such uses, as the timber of which they are constructed is usually of a very durable nature, the posts often being of oak. Many old electric cars still in operation could well be dedicated to a similar purpose. They have long outgrown their value in attracting traffic. They are too heavy to be operated economically. They are of a design too obsolete to warrant rebuilding. Their day has passed; their sun has set, and they should be replaced by more modern equipment. As was the practice with the horses of the old horse railway they can well be sent to the farm after they had outlived their usefulness. Let them end their life amid pastoral surroundings, still being serviceable as playrooms for children or as chicken houses. There they would be economically useful, but for passenger carrying service they are a decided liability.

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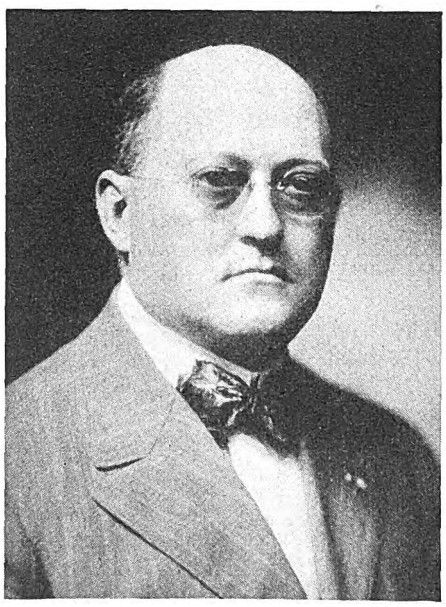
Expedients Have No Place in Solution of

Modern Transportation Problems

By J. P. Barnes
President American Electric Railway Association

A strong appeal for more fundamental thinking and a broadened conception of the problems of community transportation and traffic congestion is made by President Barnes in this article, which is based upon an address delivered before the Public Utilities Association of West Virginia

TO CONSIDER the history of the development of mass transportation in the light of present-day conditions is to note a strong tenacity of purpose, a high degree of devotion to public duty, and a great courage in performance. Ours is an industry of enormous vitality. Were this not true, it would have been an utter impossibility for the street railways of the country to have survived the tremendous economic strain to which they have been subjected by the changed and changing conditions of modern times. The public carriers of people in the city streets have doggedly fought an up-hill fight and have in the main fulfilled their obligation to the public, though in many instances at the price of appalling sacrifices. In that fight they have not had the needed sympathetic understanding and co-operation from the public.



J. P. Barnes

Ours has been the problem of how to do, without new money and without the assistance of enlightened public support, the tremendous job of revision which has been and largely still is necessary to meet the shifting needs of a rapidly developing civilization. Beset by obstacles and lacking the very sinews of war in the form of adequate credit, with a fixed investment in fixed forms of physical facilities, our industry has maintained its integrity in the midst of a world economically and physically changing with greater rapidity than any earlier civilization has experienced. Change is the order of the day—change in habit, change in ideals. Novelty is popular and stability is no longer static, but is achieved only by continuous development. Automobiles, telephone, radio have so broadened man's horizon that the measuring sticks of a generation past are good today to measure nought but failures.

C. F. Kettering, vice-president of General Motors, said at the recent Cleveland convention that the business of the advertiser today is based upon keeping people dissatisfied with what they have. The cry of mankind today is for something better, something bigger, something different. The world has stepped on the accelerator and is going somewhere. Are we in the procession?

Inertia Is a Powerful Force

It has been said that inertia plays a large part in governing human affairs. Physical inertia is the tendency of a body to continue in its state of rest or motion. The human mind is likewise subject to mental inertia which follows closely this same physical law. Inertia resists a change of direction as positively, if not as powerfully, as it resists change in speed. To correct an error in direction, however, it is not necessary to follow the heroic process of completely stopping one line of development and starting all over. When an adjustment becomes necessary, shouldering from one direction toward a more constructive direction often is the quickest and safest method of correction.

In our industry there has been little rest for the past decade or so, but it seems wise to wonder whether we have always moved in the right direction. Perhaps the most important change which is affecting the inertia of the public transportation industry is the increase which has taken place in the use of the private automobile. In the last ten years the number of private automobiles has increased from 35 to 170 per 1,000 of population—an increase of nearly fivefold in ten years. In the same period rides per capita on public transportation vehicles have remained practically constant. Surely all of these automobiles go somewhere and someone rides in them. Enormously more transportation is being used by the public year after year. The effect of inertia has been the increase in the use of the private automobile while the riding in public transportation vehicles remains prac-

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tically constant. Our problem is one of diverting the direction of our development to coincide with changing public preference. We must get back into the line of advance.

Broader Conception Needed

Transportation is more in demand today than ever. Transportation is our business. Yet we're marketing no more than formerly. We have fought to maintain our place on the public streets and in the public heart; we have fought to obtain a fare at least as large as that we had before the war. In neither battle have we been wholly successful. We enjoy no such freedom from physical interference as in the past. Measured by the 60 per cent increase of commodity prices the nickel of yesterday is 8 cents of today. Measured by the 120 per cent increase in labor costs, it is 11 cents of today. The demand for a 10-cent fare is not a demand for increase in fare, but for maintenance of fare.

We have seen the development of the automobile as a private transportation agency. We have seen this agency move toward and into the field of public transportation. Yet with the single exception of the automotive bus, which is after all merely one particular type of automobile, there has been no general adoption, and in fact no general discussion of adoption or adaptation, of these new agencies into the field of public transportation. It is true that a few of the most progressive street railways have with trepidation entered the field of taxicab operation. But, in the main, we have insisted upon the efficiency and sufficiency of the services hallowed in our minds by tradition and have not followed the public urge toward newer, faster and more convenient transportation by amplifying our basic service.

Our discussions of merchandising transportation have centered too much about the merchandising of the type of transportation we have been offering, and not enough about the changing or amplifying of local transportation service to meet the broader requirements of modern cities. We have tried to market tallow candles in a world which has learned to use electricity.

Security of Industry Rests on Meeting Public Need

We have insisted upon the preservation of the integrity of our investment devoted to public transportation. In this we are justified if we render and continue to render a needed public service. If our service should ever cease to meet a public need our claim to co-operation and conservation of our physical assets would be vain. If, on the other hand, we found the security of our properties upon the principle of continued advance and improvement to meet changing conditions, then our effort to maintain the integrity of our assets will be successful to the extent that we meet the public need and win public approval and support. These things cannot be accomplished superficially or on the basis of expediency. We must think fundamentally, we must get to the basic economics of our problems, in order that we may anticipate successfully future trends and requirements.

One of the speakers at our recent convention, N. D. Cochran, editor-in-chief of the *Scripps-Howard News,* flung a fair challenge to us when he said, "Perhaps you've been trying to win a battle, not to solve a problem." Yes, we have battled—to hold our place. And in a measure Mr. Cochran is right in intimating that perhaps we have not fully understood the public's point of view in our attempt to improve the condition of our industry. But the problem is not simple nor single. Permanent improvement in transit conditions is dependent upon the interest and co-operation of many groups in the modern community which have as yet failed to grasp the causes and the nature of the malady that is producing acute congestion of traffic and impotence on the part of public transportation. A thorough organic examination is needed to prescribe a permanent cure. Temporary remedies fail to reach the root of the trouble.

Take the single difficulty of traffic congestion, for example. The enormously increased use of the automobile has brought with it the conspicuous increase in congestion in our city streets. This is attributable to use of existing highways for a new and essentially modern vehicle in the same way and under the same general plan as for the older, slower and much smaller number of vehicles of the past generation. Present street space may have been entirely adequate for movement and storage of the buggy and wagon of the past generation. This was due entirely to the smaller population in the streets. Three and four-story buildings were the rule, for the simple reason that people would not climb more than two or three flights of stairs. Streets were accordingly designed for the accommodation of traffic based upon the population of such buildings. But with the development of vertical transportation through the perfection of the elevator came a tenfold multiplication of population within a given area, and with it a straining of the facilities for horizontal transportation. Traffic has become a problem in three dimensions, and, for those who care to follow Mr. Einstein, its effect upon the fourth dimension, time, can be readily observed in the course of an attempt to pilot a vehicle through the high building section of any American city.

Traffic Problem Not Faced Squarely

Inertia on the part of the public has operated here, and there has been little effective effort to meet the changed conditions. Branch stores, branch banks and neighborhood shopping centers have spread rapidly with little or no recognition by business men or by the public that these things have been largely necessitated by outgrown downtown streets or the out-of-date practice of wasting, instead of using, the capacity of downtown streets. This is no wail against the so-called parking evil. Even a moron knows that automobiles cannot stand and run upon the same space simultaneously. The choice is deliberate and the merchant can blame no one but himself, if his insistence upon the parking privilege sends more customers to outlying centers than it brings to his own door.

My point is that the traffic and transportation situation is affecting the fundamental character of city growth, of population distribution, of business development and social habits. (I do not say whether for better or for worse.) It is a distinct credit to our industry and our association that our leaders of thought have the vision to see beyond the limits of immediate operating problems to the greater and broader factors which are vitally important, not alone to transportation men but to every constructive agency in modern cities. We are trying to win a battle to conserve our investments. But we also are endeavoring to take a leading part in solving a vital community problem and in fulfilling the broadest possible interpretation of public service. The transportation problem before American cities today is not a problem of one agency or one group, but of all the people. It is obvious that whatever measures will expedite the movement of street cars will expedite the movement of all

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traffic, for street cars cannot move faster than vehicular traffic in busy streets, nor can vehicular traffic move faster than street cars.

Association Undertaking Broad Study of Fundamentals

Last year a committee of the American Electric Railway Association, appointed to study "street traffic and mass transportation," found from its preliminary discussion the need for a broader study than its original assignment, and that committee is now engaged in a broad investigation of the fundamental subject of "street traffic economics."

This represents a transition from the superficial study of symptoms to the fundamental study of underlying causes. Constructive and effective treatment of transportation and traffic congestion demands the discovery, interpretation and intelligent application of the basic economic principles which govern the use of available street facilities. We must construct a suitable foundation before we can erect a proper and stable superstructure.

Additional committees are being appointed this year for a study of the economics of fare structure and for an analysis of transportation research. The organization of economic studies in other fields directly affecting the broad problem of community transportation is under discussion. As an association and an industry today we are endeavoring to cut through superficial expediencies in an attempt to find fundamental remedies for present-day difficulties. Engaged as we are, in a business for which there is a continued and continuing need, we have too often sought the easy and temporary solution, and too seldom insisted upon the fundamental remedy. We are engaged in the business of public transportation, and the type of transportation demanded has changed and is changing from day to day. We must follow that change if we would build our business upon that permanence which is continuous improvement.

Need to Improve Load Factor

Turn for a moment to the topic of one of this year's new committees, that on "fare structure." May I suggest that in all parallel public utilities, in the electric power, light, gas, telephone and telegraph services, there has been a recognition in the rate structures of the importance to those industries of satisfactory load factor. In every one of these industries off-peak service is obtainable at such rates as are calculated to attract additional volume of business and thereby improve the load factor and the gross revenues of the business.

How many fundamental attempts have been made to improve the load factor of the public transportation industry? The weekly pass, the daily pass, the nickel card, the reduced-rate ticket, have all been tried, usually in some combination dictated by expediency or a compromise in public hearing rather than by any basic study of the economics involved. We are almost wholly ignorant of the effect upon load factor, and hence upon gross earnings, of the many possible modifications of rate structure. We are almost wholly ignorant of the effect upon load factor, of varying or alternative forms of service at various hours of the day, or of variations in the public's use of our service.

We do not see deeply into the psychology of the traveling public. We can guess, but we cannot demonstrate the considerations which urge vast numbers of individuals to use a private vehicle at greater expense, and in some respects at greater inconvenience to themselves than would be occasioned even by our present services. We need more of the psychology of the small boy who, when asked how he succeeded in finding the lost horse, said, "Why, I just thought what I would do and where I would go if I were a horse, and I did, and went, and there he was." We must get at the ruling motives which determine the character of transportation chosen by the public of today. We must put ourselves in a position to offer that type of transportation which the public wants. This is a problem of research, if you please. It is a problem of sales psychology. It involves the study of a mental attitude whose self-analysis and self-expression is neither candid nor correct.

All these things, in one form or another, have been expressed in the addresses, articles and committee reports presented to the industry in the last few years. The 47th convention of the American Electric Railway Association at Cleveland in September was a high spot in the history of the association and the industry, not because it was the largest convention ever held, but because in the course of its meetings there were expressed more conclusions based on courageous, independent and fundamental thought than in any other similar meeting of the association.

Must Get Rid of Inhibitions

What I am trying to say is that our association and the individual companies engaged in the public transportation business must rid themselves of those inhibitions which are based upon precedent, habit or inertia. We must take inspiration from our potential customers who are today our competitors. We must step on the gas and go somewhere. But we must know where we are headed. We must base our program firmly on the fundamentals of public transportation. We must study and understand the economics which underlie the growth, development, habits and movements of the modern community. Everything, in short, which bears directly or indirectly upon the public transportation of a community must be weighed, analyzed, and properly fitted into the structure of the public transportation business, if that business is to continue and is to render a maximum of public service.

We must view the problem in perspective. We must regard as the tools of our trade every vehicle which rolls, or slides, or can be pushed or pulled, or driven, on the surface, under the surface, or above the surface. And, we must fit these various elements into the composite public transportation system, which will serve, as nearly as may be, the entire public transportation requirement of the modern community, with maximum public convenience, with minimum expense, and with a true spirit of public service. This accomplished, public recognition and public reward will surely follow.

Toward this program of fundamental thinking the industry has for the past several years been steadily progressing. To this program of fundamental thinking it stands today committed. It is no over-night or week-end program. Earnest, untiring, patient and undiscouraged effort must, and will, be brought to its accomplishment.

It is said that the three hardest words of the English language to pronounce are "I was wrong." These words we will learn to pronounce whenever we find ourselves to have been in the wrong. An error admitted is half corrected. By the correction of errors, by the comprehension of fundamentals and by the courageous application of ideals, we propose, as an industry, to push forward toward the fulfillment of our inherited destiny.

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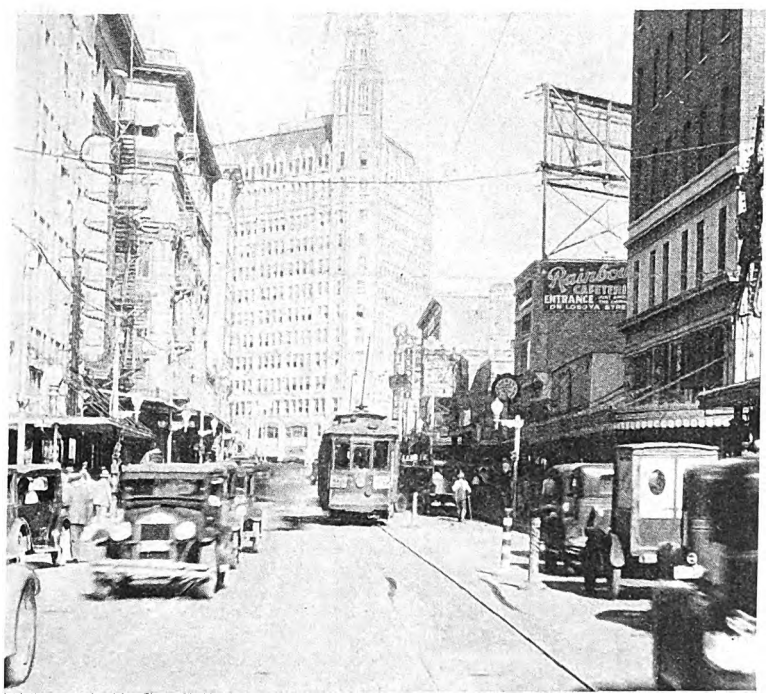
San Antonio

Plans for the Future

as Well as for the Present



Houston Street is one of the principal business thoroughfares of San Antonio

Electric cars supply transportation for the greater part of the area 3 miles from the business center. Buses furnish all service beyond this limit. The company has developed its system so as to be in a position to provide for future expansion of the community which it serves

SAN ANTONIO occupies an area 6 miles square in extent, with its business district practically at the center of this rectangle. With the addition of the suburbs, which also must be served by local transportation, the actual district involved is approximately 65 square miles. The population of this entire area is about 265,000 inhabitants. Home sites are relatively cheap and practically every family lives in a single house. Even in sections where people of moderate means are living, the lots are comparatively large. There is only one apartment house in the city, and it has 28 apartments. The climate is almost ideal for automobiles. These facts place a handicap on public transportation systems in that more lines of public transportation are required to cover the city, and less frequent service on each line is justifiable.

The manner in which this problem was approached and solved by the Public Service Company, the operating company in San Antonio, is told in its Coffin prize brief for 1928. The solution is notable because of its comprehensiveness. It involved the adoption of a system of fares which would not only be satisfactory at the time but which would remain so in the future with the probable expansion of the city in area and population. It comprised changes in car routing and an application of the bus to give a necessary supplementary but not competitive service. It included provisions by which extensions of bus and car service could be made in the future without material change in the existing arrangement. The statements in the brief are summarized in what follows.

Combines Electric, Gas and Railway Property

The Public Service Company in San Antonio operates the gas and electric utilities also. So far as the transportation department is concerned, this has been a mixed blessing. It has enabled the transportation department to continue in business for a longer time without drastic action, and the public good will brought about by efficient service in the gas and electric departments have been of help to the railway. On the other hand, transportation policies have had to be determined for the good of the company as a whole, and only the most conservative methods could be used. It has therefore taken the railway longer to accomplish results than might have been possible if more drastic action had been open to the transportation department.

The transportation policy is based on a principle that applies in all merchandising, i.e., that to make a sale the article must not only be of value to the customer but of greater value than similar articles that can be obtained elsewhere. It must also be convenient for the customer to obtain the article. In the company's study of its own situation it has been gratifying to find that in most cases the actual desires of the public for transportation are best served by the most economical practice. Thus the principal desire of patrons of public transportation probably is to save time. It is true that comfort and safety are also essential, but as the length of a ride in urban transportation is relatively short, comfort may be given second place, and as safety has become accepted as an axiom in public transportation, it may not be made a

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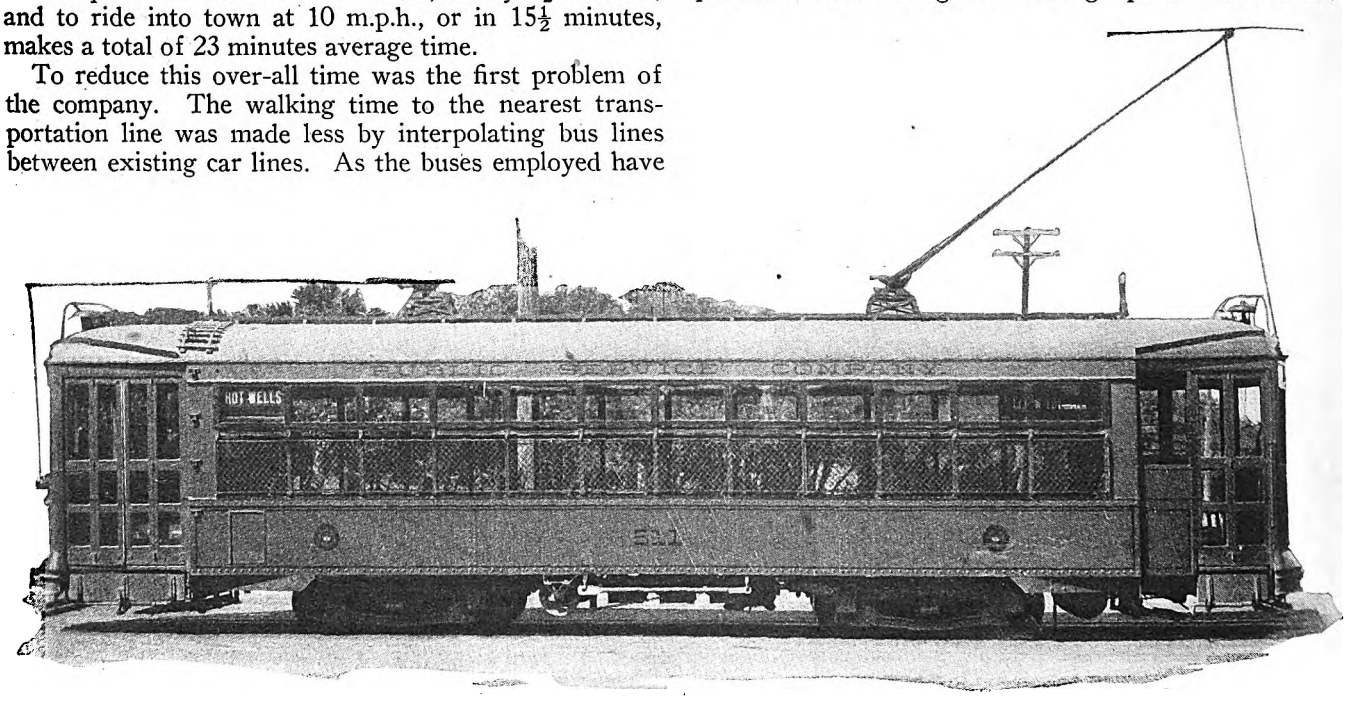
paramount thought because it may be taken for granted.

An analysis of the time required by a patron in his use of public transportation may be divided into three parts: that required in going to and from a transportation route, the time spent in waiting for a vehicle, and the time spent in transit. Each of these receive attention in San Antonio, with the object of making the total elapsed time for individuals between their homes and the downtown section on the average less than that which would be required if the same patrons used private automobiles between these points. For instance, the car lines in San Antonio, at a distance of 2¾ miles from the business center, average 0.88 mile apart, and the average walk to the nearest route from the residences in this section is approximately a quarter of a mile, requiring about four minutes. To this should be added the average time required to wait for a street car, or say 2½ minutes, and to ride into town at 10 m.p.h., or in 15½ minutes, makes a total of 23 minutes average time.

To reduce this over-all time was the first problem of the company. The walking time to the nearest transportation line was made less by interpolating bus lines between existing car lines. As the buses employed have less capacity than the cars, and consequently require fewer stops, a faster operating speed was possible.

The second item, that required in waiting for public transportation vehicles, is dependent upon the headways, the reliability with which the schedule is maintained, and the knowledge had of the schedule by those using the transportation provided. Headways in practice are dependent upon the volume of traffic and the size of the vehicle used. Where there is sufficient traffic, even large cars may be scheduled on such close headways that there will always be a car in sight, but where the business is relatively light it is desirable to use smaller units with more frequent headways. In either case the service given is unsatisfactory unless there is the most exact adherence to schedule. It is to this point that the San Antonio Public Service Company devoted a great deal of attention. In fact, to those who think that the "car in sight" basis of operation is necessary to compete successfully with private automobiles, it will be a revelation to learn the extent to which the public in San Antonio will use a service with relatively long headways where it knows the schedules and has found by experience that the schedules are maintained with clock-like precision.

The third item—time required in transit—is affected by several factors. They include the distance traveled, the conditions of the track, the equipment used, the number of people carried and stops made, the schedule speed and the ability of the crew to maintain the schedules. Each of these has its angle of approach. The route should be as direct as possible. Roundabout routings raise a greater psychological objection in the minds of passengers than the actual loss of time, because the time thus lost becomes exaggerated in their minds. Track well maintained not only adds to the comfort of the ride and is more economical in energy used and in cost of maintainence, but it permits faster schedule speed. New equipment should be selected and old equipment improved on the basis of its ability to accelerate rapidly and give rapid braking, because in city service with frequent stops, good acceleration and braking are most important factors of good running speed. In addition, good acceleration is needful in competition for street space, and good braking is essential in the matter of accident prevention.



Latest type of street car in use in San Antonio

The number of passengers carried on a given trip also usually has a close relation to the number of stops required. While it is possible to carry some standing passengers without seriously increasing the time of passenger interchange, when aisles become congested with standing passengers, the time taken for stops is out of proportion to the additional number of passengers carried.

Running time can often also be appreciably reduced by the establishment of an express service, supplementing a local service.

Comfort and Safety Also Considered

The factor in transportation above mentioned, coming next to speed, is comfort. There are many ways of contributing to this end, but the outstanding desire of the passenger is for a seat. This is especially true of off-peak passengers, and the desire for a seat increases with the length of the ride. Fortunately for transportation companies, however, this desire is not uppermost during peak hours, when it is economically impossible for an

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TABLE I—FARE STATISTICS AND RUNNING TIME SAN ANTONIO

	Central Zone — Street Car	Central Zone — Bus	Second Zone Bus	Third Zone Bus	Fourth Zone Bus
Distance of outside limit of route from business center, miles	3	3	1½	1½	....
Running time, minutes.	20	15	20	25	30
Fares, cents					
Cash	10	10	15	20	25
Tickets	3 for 25	3 for 25	5 for 50	5 for 75	5 for $1
With 25c. weekly pass.	5	5	7	10	15
Average per seated passenger	6.5	6.5	9.3	12.7	17.9
Fares, cents per mile:					
Cash	3.33 2.67 w.t.	3.33 2.67 w.t.	3.33	3.33	3.33
Tickets	2.78 2.22 w.t.	2.78 2.22 w.t.	2.22	2.50	2.67
With 25c. weekly pass.	2.33 1.87 w.t.	2.33 1.87 w.t.	2.00	2.00	2.27

Central zone bus fares, as listed above, apply also to rides within any zone; for each additional zone 5 cents extra is charged, *i.e.*, the fare from any zone to the next zone may be paid by 15 cents cash or by a three for 25-cent token, plus 5 cents, or by one five for 50-cent ticket. In the same way the fare through three zones, or say zone 2 to zone 4, may be paid by 20 cents cash or a three for 25-cent token plus 10 cents or by one five for 75-cent ticket.
w.t. = with transfer.

electric railway to give a seat to every passenger. However, the fact should not be overlooked that many automobile riders do not use public transportation at any time because of the usually crowded condition in cars at rush hours. Hence, a high standard of service in this respect during peak hours should be adopted, and of greater importance is the maintenance of schedules to provide an even distribution of loads in the cars that are operated.

Safety, the third item mentioned, is one of the chief sales points with the public in the use of public transportation. Any doubt on this subject will be dispelled when the reluctance with which most people consider the use of air transport is considered. Yet in competition with private automobiles, the acknowledged safety of public transport does not seem to count for so much because everyone feels competent of his own ability to drive an automobile with an equal degree of safety. Nevertheless, the safety of car riding is a sales point which should be continuously emphasized by railways.

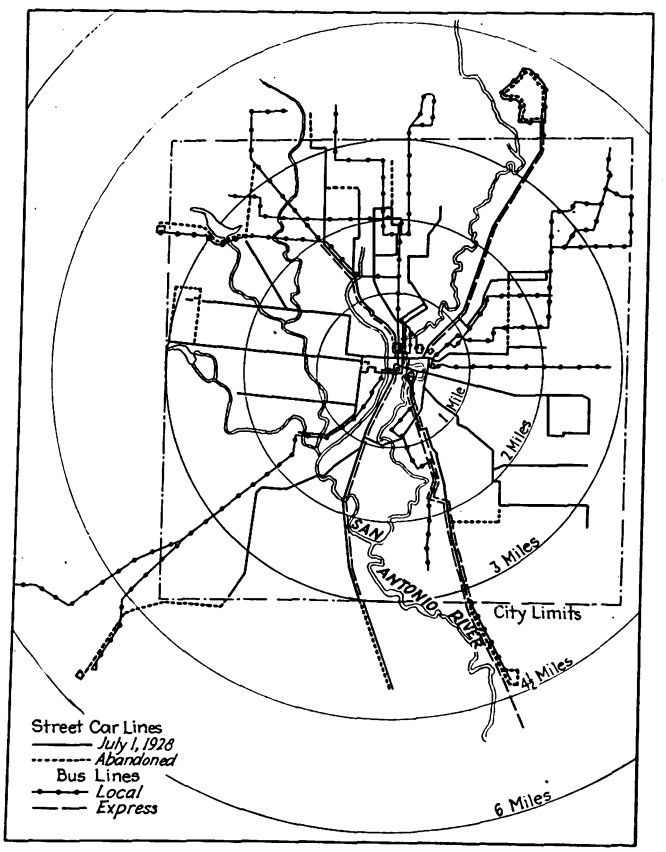
Need for Emphasizing Modernization

The general requirements of a good ride, just explained, are fundamental, just as the basis of sterling is with silver. But like that, they are not new or sensational, and some other means may be necessary to induce habitual automobile users to give public transportation a trial. This is the reason of many of the things which street railways are doing under the slogan of modernization. It does not matter a great deal whether it is bright paint, upholstered seats, white caps on the crews, or many of the things which are being tried, so long as some of them are done. All show the public that public transportation is abreast of the times and they give a reason to those who have not been using the service to try it. But unless the service is excellent in the fundamental principles enumerated, the trial will confirm the automobile rider more strongly in his habit of using his own transportation.

With this in view, a plan of service has been adopted in San Antonio by which the public is receiving what it wants in public transportation as nearly as it is possible to give it.

The next step was the establishment of a rate of fare which would be satisfactory to the public, and at the same time adequate to cover the cost of furnishing this transportation.

To meet the conditions in its territory the San Antonio Public Service Company adopted what may be called a zone service plan. The central zone is the area approximately 3 miles from the business center of the city. Additional zones are approximately 1½ miles each. Local service is furnished in the first zone, and it is planned to furnish express service to each of the succeeding zones. The advantages to the passenger are apparent. The time required for a street car to make the 3-mile local trip in densely settled sections is approximately twenty minutes, yet the same twenty minutes is sufficient for a bus to give express service to the beginning of the second zone and local service through it. Corresponding time savings are available for each succeeding zone. Another advantage to the passengers is that they



Electric railways serve the population within the 3-mile limit at a flat fare. Buses at a higher fare operate beyond these limits

are segregated into groups of neighbors with a considerable degree of personal and community interest. The value of this, while intangible, is very real.

From the economic standpoint, the value of the time saved in furnishing the service is also self-evident. In segregating the passengers into distinct groups, the complications of collecting different rates of fare for different distances is greatly reduced. Again, passengers are willing to pay an additional fare for the increased convenience of the more nearly personal express service. Finally, a schedule of fares has been worked out which allows a rate charge approximately proportional to the distance traveled. This permits future extensions to be made on an economical basis. A certain number of through local buses care for travel between the outside zones, such as between 2 and 3 or 2 and 4.

The lowest payment for fare, as shown in Table I, is a nickel, good only when used with a 25-cent weekly

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pass. This form of pass has an especial flexibility in connection with varying zone charges, as shown in the table. For instance, for the central zone passenger, it may be considered as requiring 7 cents for each peak hour ride, and 5 cents for each additional ride during periods of light traffic. For the other zones a somewhat higher rate.

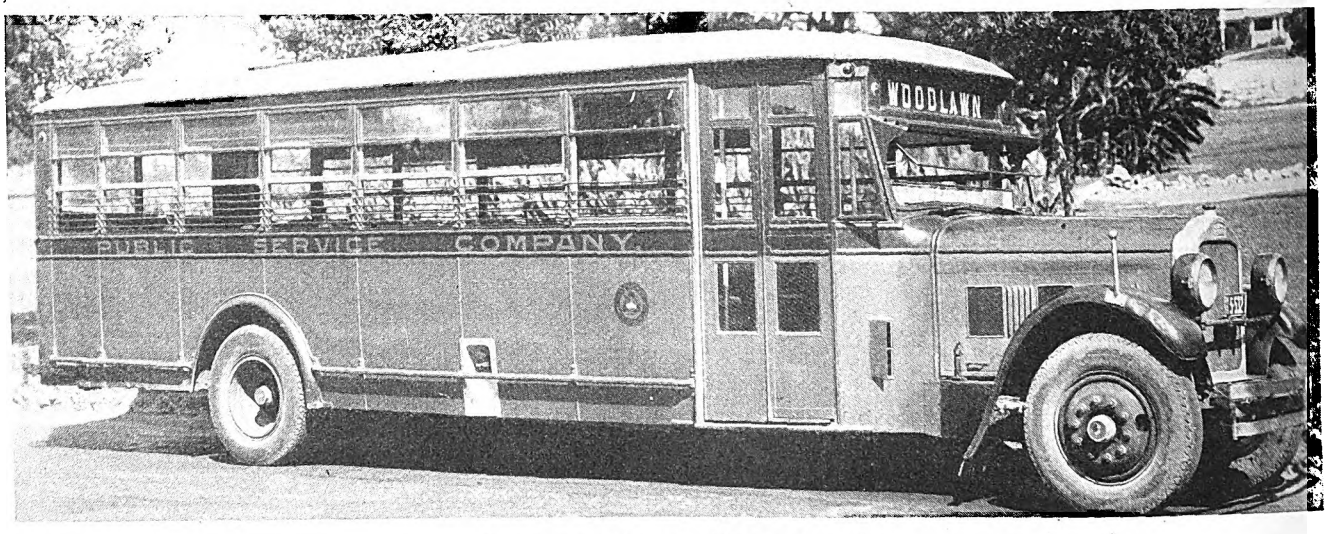
It will be noted from the table that all fares are on a sliding scale, not only as to the distance but also with respect to the frequency with which the passenger uses the service. It will also be noted that although there are twelve rates of fare, only one of the twelve requires the use of any odd cents. Finally, where passengers are segregated into vehicles where only one scale of rate is in effect, only three rates are applicable in that vehicle. A footnote to the table gives the fares between zones other than the central zone.

From the figures in the lower part of the table, it will be seen that all riders paying cash fares are charged $3\frac{1}{3}$ cents per mile. It will also be noted that both the ticket and cash rate in the central zone are somewhat higher when reduced to a mileage basis than in the other zones where transfers are not used, but that they are no higher, and sometimes less, when the passenger uses a transfer.

TABLE II—REQUIRED LOAD FACTOR IN DIFFERENT ZONES IN SAN ANTONIO

	Seat Trips per Hour Furnished	Pass. Required per Hour	Per Cent Required Load Factor
Central Zone			
48-passenger street car	144	65.5	45.5
32-passenger street car	96	46.2	48.2
33-passenger bus	132	50.0	38.0
21-passenger bus	84	36.0	43.0
Second Zone			
33-passenger bus	99	35	35.5
21-passenger bus	63	25	39.7
Third Zone			
33-passenger bus	79.2	25.7	32.6
21-passenger bus	50.4	18.4	36.6
Fourth Zone			
33-passenger bus	66	18.2	27.6
21-passenger bus	42	13	30.9

One bus line express for 2 miles in central zone and local for the rest in that zone and in the second zone.
Three bus lines express in central zone and local in second zone.
One bus line local in three zones.
One bus line local in four zones.
One bus line express in the central and second zones and local in third and fourth zones.



Latest type of bus used in San Antonio

Determination of Necessary Load Factor

With the figures given in Table I and the cost per hour of the various services, the company has determined the load factor necessary to keep the service financially self-sustaining. For this purpose, the cost per hour, including all investment charges, may be assumed as follows:

48 passenger street car with two men	$4.25 per hour
32 passenger street car with one man	3.00 per hour
33 passenger bus	3.25 per hour
21 passenger bus	2.33 per hour

From these figures the required load factors as given in Table II have been determined.

This table shows that the required load factor becomes less for the outer zone, where the need for seating passengers becomes greater. For this reason it is economically possible more nearly to approach the standard of a seat per passenger for the longer rides to the outer zones.

Division of Business Between Car and Bus

There are now in operation in San Antonio:

Eighteen street car lines in the central zone.
Six bus lines in the central zone.
Two bus lines local in both central and second zone.

From this it is seen that there are eighteen street car lines and ten bus lines serving the central zone. Of the total number of revenue passengers on the system, 82 per cent are carried on street cars in the central zone and 12 per cent of the total number are carried by buses in this zone. The nine bus lines going into the outer zone carry in the outer zone only 6 per cent of the total revenue passengers. From this, the averages shown in Table III may be obtained.

TABLE III—PASSENGERS CARRIED PER LINE

Lines	Percentage of Passengers Carried per Line
Eighteen street car lines in central zone	4.56
Ten bus lines in central zone	1.20
Nine bus lines in outer zones (four also local in central zone)	0.67

It is apparent from Table III that the street cars are being used on the lines where the volume of traffic is greatest. This is carrying into effect the established principle that street cars furnish the best and most economical transportation where great numbers of passengers are to be carried.

Some Track Abandoned

To rearrange the transportation lines in accordance with the zone service plan and to straighten out some of the indirect routing, it was necessary for the company to

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abandon more than 15 miles of track on fourteen different lines. The completeness with which this policy has been carried out is shown by the fact that only five of the eighteen car lines now cross the 3-mile circle, and these lines average less than ½ mile outside this circle. This distance is so small that second zone fares are not collected on any of them. It is further expected that the overlapping will be eliminated on three of these lines.

It is naturally impossible to have all routes so direct that only 3 miles of route from the downtown district is necessary to reach the circumference of the 3-mile circle. But it is worthy of note that only one car line is longer than 4 miles, and this line is a combination of two light traffic lines.

The schedule speeds which have been obtained with this plan of operation have been relatively high. In connection with this fact it must be remembered that schedule speed is affected by three factors, the speed between stops, the number of stops and the average length of the stops. On a short line where the cars are filled, there are naturally more stops per mile and the stops are of longer duration, so that short lines cannot make as high schedule speed as longer ones.

Table IV shows the schedule speed of the various kinds of line, in elapsed time, which includes running time, stopping time and layover time.

TABLE IV—SCHEDULE SPEEDS IN MILES PER HOUR

	Minimum	Maximum	Average
Single-track lines	8.49	9.32	9.00
Double-track lines	9.44	11.55	10.00
Bus lines	9.57	14.62	12.38

TABLE V—PERCENTAGE OF VARIOUS FARES PAID BY REVENUE PASSENGERS

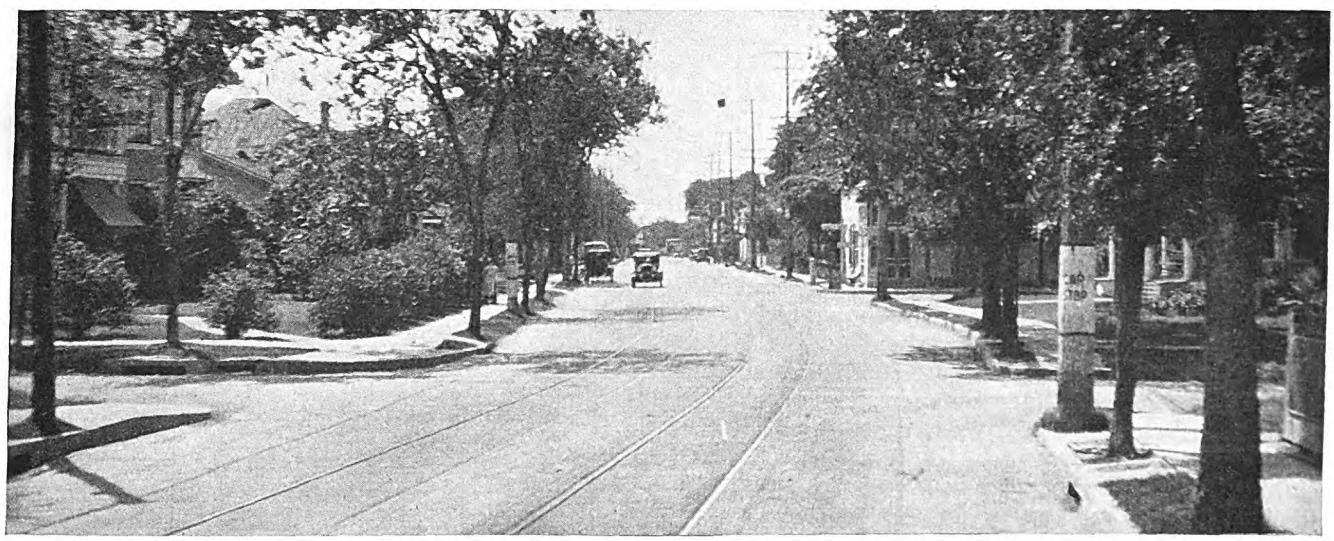
10-cent cash fare	33.0
Three for 25 cent token fare	23.8
Nickel fares on passes	39.4
School rates	3.8
Total revenue passengers	100.0

Percentages of Kinds of Fare Paid

The revenue passengers represent 80 per cent of the total passengers. The average rate of fare in the central zone for revenue passengers is slightly in excess of 8 cents, and for all pasesngers it is approximately 6.5 cents. Nickel passes are sold at an average rate of 12,250 each week, and they are being used for an average number of rides of fifteen per pass per week. For purpose of comparison with the other form of weekly pass, this is the equivalent of eighteen rides per week when transfers are taken into account. At fifteen rides per week the average income from nickel pass riders is $1 per week per pass.

Traffic Checked Constantly

Continuous checks are made of traffic to guide the schedule maker. Conductors' trip sheets give the maximum inbound and outbound riders. These figures are supplemented by street checks taken along the entire route. Three weekdays are selected in each month on which to make a street check for each line. The results are then charted so that characteristic curves for each month are obtained. The curves for the three months in each of the four seasons are then put on a single chart to show the general characteristics for that season.



Present condition of track laid in 1914

It has been found in San Antonio that this season division is very satisfactory, due in part to the fact that the schools are not in session during the greater part of the three summer months. From these charts the traffic demands for succeeding seasons are estimated.

Changes necessary in the basic schedules are made through "special service" cars or buses.

Cars and Car Equipment

The maximum number of cars required in basic service in San Antonio during 1927 was 120 cars. To have these cars available, 135 were kept in good operating condition. Of this number, 35, or 26 per cent, were purchased within the last five years. A number of the older cars are retained for circus days and other special events. They are kept well painted but are not of the same standard as the cars used in regular service.

The last ten cars received in 1925 were equipped with an air-operated register ringing device, electric signal between the conductor and the motorman, brass side sash, and center lighting fixture. Since they were put in service, brass side sash have been installed in eight additional cars, and brass vestibule sashes in one car for trial. Semi-flush center lights with oval shades have been installed in 74 cars, air-operated register equipment in 70, electric signals from conductor to motorman in 40, Feralun safety treads in 74 and Faraday burners on 70.

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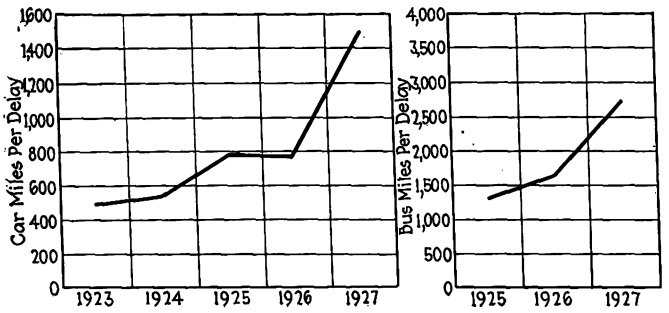
The company has now 62 buses in use, of which 30 were purchased between 1923 and 1928 and sixteen in the latter year. Before a new bus is accepted it is run over a test course on paved streets, making complete stops at alternate street intersections, to determine its ability to maintain fast schedules. All buses are also tested for riding comfort by a device developed in the shops and known, for want of a better name, as a bump



These graphs show the increase in miles run from better maintenance

meter. It is a spring-arm carrying small equalizing weights and a pen for making a graphical record on a strip of paper which is wound about a slowly revolving drum. It may be placed either on the floor or upon one of the seats.

Tests with this meter have shown very plainly that balloon tires afford so much easier riding that they are now specified on all new buses and have been installed on a number of the older buses. The former high pressure tires were 32x6 and cost in operation about 1 cent per bus-mile. The balloon tires are 34x7½ in. and their cost is approximately 50 per cent more.

The first buses purchased were equipped with rattan seats, but the later buses were furnished with leather-cushioned, double spring-edge double seats. Tests with the bump meter on both types of seats did not show as much difference in riding quality as was expected. However, the appearance of comfort and luxury gave so much satisfaction to passengers that all rattan seats in the 23 buses so equipped have been replaced with leather cushion type seats at a cost of more than $7,000. Not only are leather upholstered seats specified in purchases of all new buses, but they must have either two complete layers of springs, or an air cushion supplementing the springs.

Overhauling Practice in San Antonio

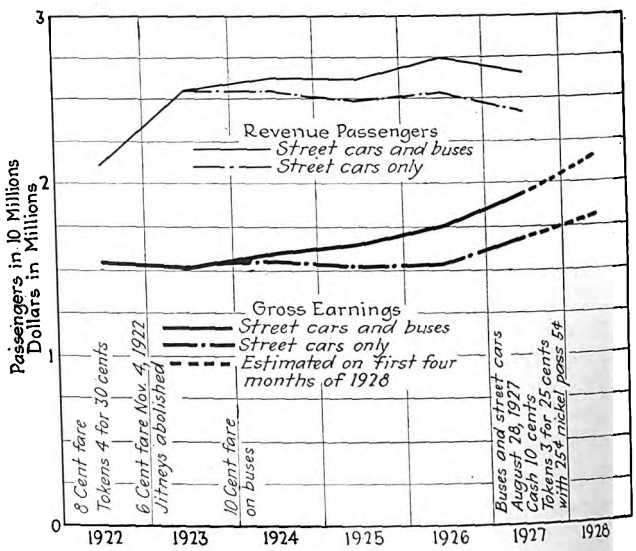
Several years ago cars were repainted at intervals of from four to five years, a period based on the ultimate life of paint. There was considerable fading, but as long as the paint was in good physical condition that was considered satisfactory. For many years the standard color scheme was orange below and lemon above the belt rail, with roof trim and lettering in Indian red. To improve the appearance of the cars it was decided to reduce the period of repainting to two years, and when this standard was attained, the period was reduced to one year, the present standard. All buses have been on this standard from the beginning.

The present standard of coloring for cars, after some experimentation, is lemon below and green above the belt rail with the company emblem on each side of all equipment. For the interior, natural wood finish and two shades of some harmonizing light colors are used to suggest roominess, cheerfulness and restfulness. Circuit breakers, meters, switches, piping, etc., are painted in the same shade as the rest of the interior to make them less conspicuous.

The one year interval for painting is also the standard of overhaul for both cars and buses.

The overhaul on buses is as follows: The engine, including clutch and transmission, is removed and left in the garage for overhaul. The body is left on the chassis and moved into the carpenter-paint shop bay where the body receives a complete overhauling and painting. While this is being done, the frame of the engine is either changed for a new one of standard bore or ground to over-size and new sleeves are installed, depending on the type of engine, and new pistons and rings are fitted. The crankshaft is either ground or replaced, according to conditions. The carburetor, generator, starter, clutch and other parts are thoroughly cleaned and inspected, the valves and seats are reconditioned and any necessary repairs or adjustments are made. After these operations are completed, the engine is reinstalled and the bus is returned to service.

The overhauling of the street cars follows the same general system used for buses. One of the outstanding operations done on the street cars is the building up by welding and reboring to standard size, or boring to oversize, of the axle and armature bearing housings of the motors, thus correcting the gear centers. All mechanical parts are thoroughly gone over, cleaned, inspected, adjusted, tested and repaired, and the electrical equipment is tested. The armatures and fields are dipped and baked and again tested. On the strength of the reports of the noise reduction committee of the A.E.R.E.A. helical gearing is being installed on the smaller types of motor.



This chart shows the development in earnings and passengers carried

While this shorter period for overhaul has temporarily increased the cost of maintenance, the management feels that when the first overhaul cycle is completed the costs will fall considerably below even those of 1923. Already there has been a noticeable decrease in run-ins.

Approximately half the street cars have been through the shop on the first cycle of overhauling. The miles per chargeable run-in averaged 25,508, in 1927, compared with 13,214 in 1926, and for buses 2,800 miles in 1927, compared with 2,200 in 1926.

With the higher bus and car maintenance mentioned, corresponding higher standards have been established in track maintenance. Perhaps the most important develop-

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ment has been in the extension of the use of welded joints. Welded joints have always been used in track in concrete on paved streets, this form of construction constituting 77 per cent of all of the track. In 1924 an experiment was made of welding joints in gravel ballasted tracks. The experimental section was 1.43 miles in length, and it proved so satisfactory that additional gravel ballasted track has been improved by welding the joints. The method is now being extended to all track, so that at the present time 87 per cent of all the track has welded joints. This is not only effecting a great improvement in riding quality of the cars and in noise reduction, but it is also materially reducing the cost of track maintenance.

Financial Results

A very satisfactory measure of success in any kind of transportation is the result on the company's finances and the growth of its business. Both are shown approximately in an accompanying chart. The year 1923 was the first of operation after the elimination of jitneys and with a 6-cent fare. The gross earnings in that year were $1,528,946. These earnings increased in 1926, when they were $1,761,422. It is felt that this increase is largely due to the supply of local service to the public. The willingness with which the public granted the company a higher rate of fare in 1927 is considered a further tribute to the satisfaction which the service is giving. This increase became effective only during the latter part of 1927, but it enabled the gross earnings to be further increased to $1,953,696 in that year. Based on the first four months operation in 1928, it is estimated that the gross earnings will be in excess of $2,200,000 in 1928, corresponding to an increase of 44 per cent for four years. The accompanying curve shows graphically the history of the gross earnings during the past six years.

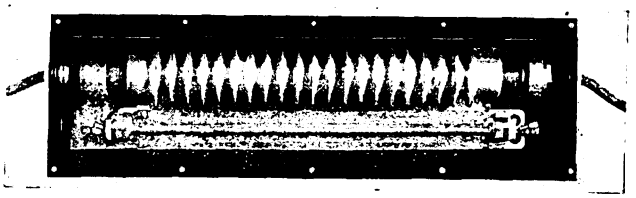
Telephone Dispatching

A feature of railway and bus operation in San Antonio is the method of dispatching by telephone, but an account of this will have to be reserved for a later issue.

Resistor Heaters Used in Cleveland Articulated Cars

Each duplex unit has 45 motor resistor heaters arranged to give the same resistance values on the different controller notches as regular resistors

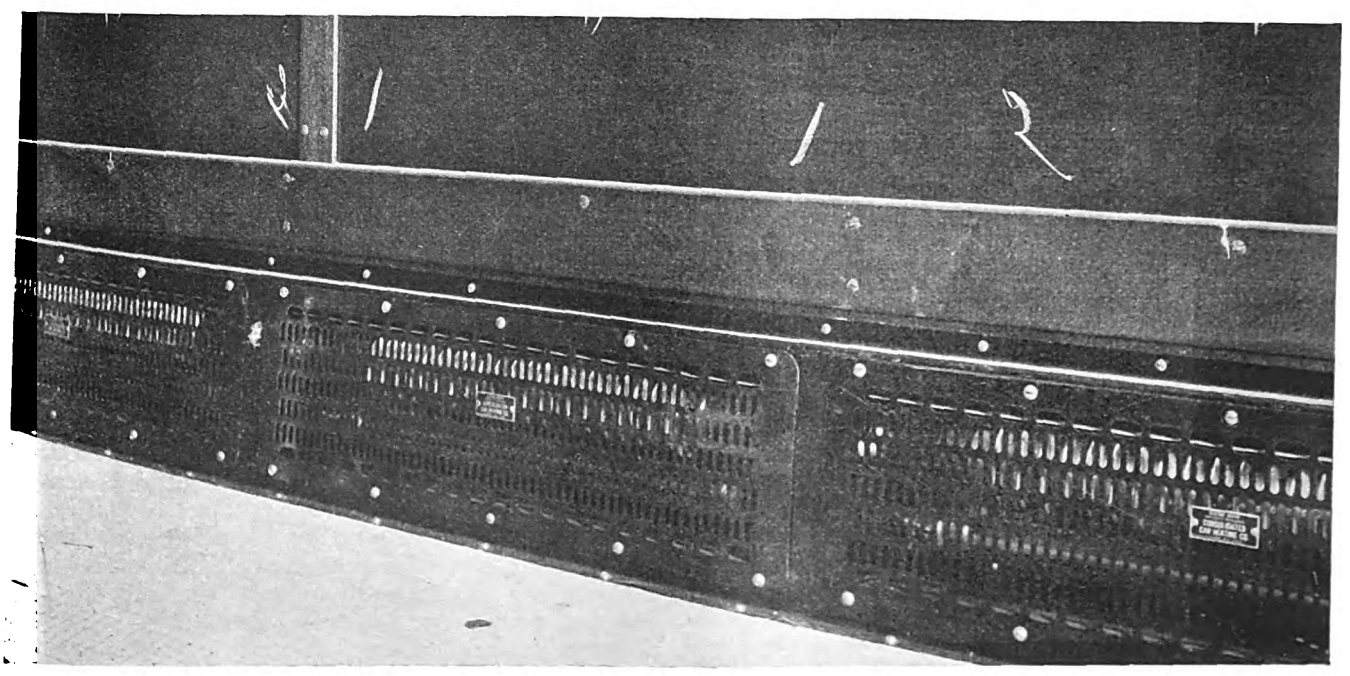
RESISTANCE losses are converted into useful energy for heating the new duplex cars of the Cleveland Railway, through use of motor resistor heater equipment. The heating apparatus includes eighteen Consolidated Car Heating Company double unit panel heaters in the rear section of the car and 27 heaters in the front section. Of these 27 heaters 24 are duplex heaters, each having one motor resistor heater unit and one regular



The duplex heater has one motor resistor unit and one regular inclosed-type heater unit

inclosed type heater unit, and three having motor resistor heater units only. The motor resistor heater units are divided between the various resistance steps so that all units are subjected to approximately the same energy input. They are arranged to give the same resistance values on the different controller notches as the regular motor resistors under the car.

All heaters are of the panel type and are installed in a continuous duct along both sides of the car. In addition there is also a 1,200-watt, 600-volt vestibule heater for the motorman. The motor resistor heater unit is of extremely rugged construction. It was designed to



Panel type heaters are installed in a continuous duct along the sides of the car

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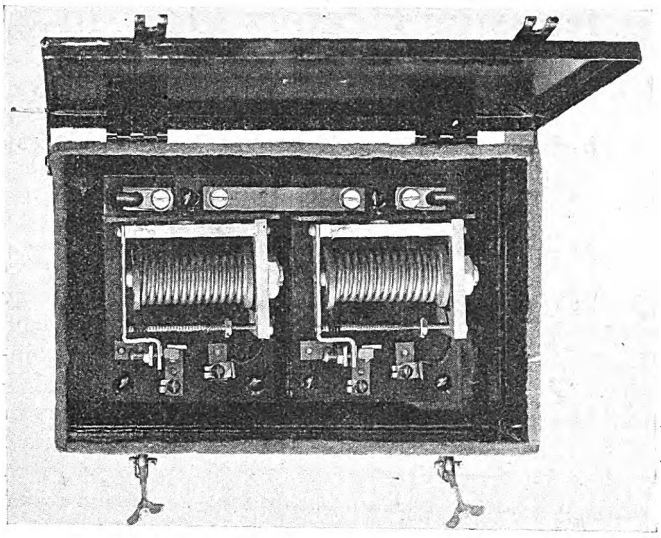
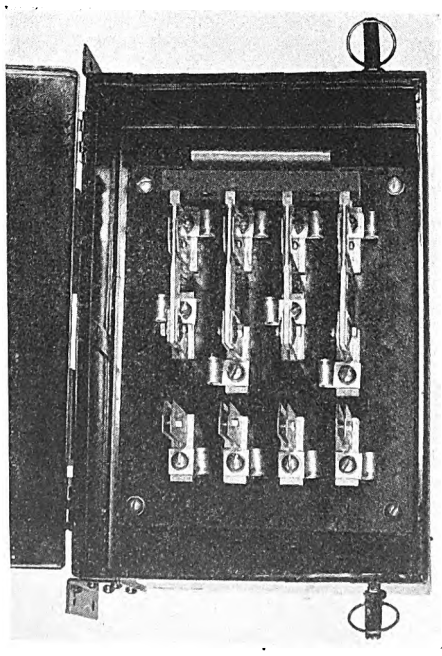


Two peak load relays are mounted side by side in a steel box with hinged cover

obtain the necessary mechanical and electrical strength and thermal capacity to insure the unit standing up under severe service conditions. The resistance element of the unit is a nichrome wire coiled in a helix. This resistance element, with terminals swaged on both ends, is placed in a steel tube, the terminals extending out through suitable insulating bushings placed in each end of the steel tube. After the resistance element is placed in the tube with ample clearance between the element and the wall, the tube is filled with a specially treated insulating powder and is then put through a swaging operation which reduces the diameter of the tube and compacts the insulating powder inside the tube. The result is that the resistance element, although self-supporting under normal conditions is held firmly in the center of the tube and cannot come in contact with the steel wall under any condition.

Lead wires of approximately 18 in. length are swaged into the terminals and to protect these connections a short length of steel tube of larger diameter than the main tube extends approximately 2½ in. beyond the end of the latter and is welded on each end of the tube. This forms a junction space which later is filled with a high temperature compound. In order to obtain thermal capacity and radiating surface an aluminum casting surrounds the steel tube. A four-pole double-throw change-over switch is used for connecting the motor resistor heaters in the motor control circuit or for using the regular resistors under the car.



A four-pole, double throw switch is used for changing over the circuit from the motor resistor heaters to the standard car resistors

Another feature of the heater equipment is the use of a peak load relay which cuts out the regular heaters while the car is using maximum power—that is, during the acceleration period. This relay is in circuit with the heaters in both sections of the car so that during the time the motors are taking the heavy accelerating current no current is taken by the regular heaters. The operating coil of the relay is of heavy bare copper wire and is connected in series in the motor circuit. The relay is provided with means for adjustment so that it can be set to operate at the desired current value. The contacts of the relays are in parallel with the thermostat of the regular heater equipment and therefore carry only a very small current.

The regular heating elements in both the front and rear sections of the car are under thermostatic control, each section having its own thermostat equipment. It is estimated that the accelerating resistance losses, which will be converted into heat in the car when the motor resistor heater units are being used for acceleration, will average approximately 6.6 kw. during the time the car is in service.

Noise Reduction Efforts in London

EFFORTS of the London Underground Electric Railways to reduce noise on its underground lines were pointed out recently by one of the company officials. The statement was inspired by a somewhat sweeping indictment on noise in the tube railways, contained in an article by Prof. Henry J. Spooner in *The Nineteenth Century and After* for September.

The statement in defense of the railways points out that the noise in underground lines is caused primarily by the contact of steel upon steel but is intensified by the limited space to which the noise is confined. The paramount need for minimizing any risk of fire necessitates the employment of metal in some instances where wood or other sound absorbing material would be utilized on an ordinary railway.

A number of steps, however, have been taken and have already been mentioned in ELECTRIC RAILWAY JOURNAL for Oct. 1, 1927, page 567.

The statement goes on to point out that noise can be kept out of the cars to a large extent if the windows are kept closed, but this makes the cars uncomfortable to ride in. Noises arising from the wheels and other parts of the truck can be kept from entering the car by a skirt surrounding the truck and wheels, but this cannot be very low, because it would then hinder free access to the brake gear, and other mechanism. Various forms of gears are now being tested to reduce noise but as improvement in this direction is made there is a call for higher speeds, and higher speeds cause increased noise.

Efforts to reduce the noise by changes in the track have been confined largely to keeping the rails smooth and using resilient material under the rails. Rail grinding, particularly of rails on curves, has helped, but the rubber and composition pads inserted between the rails and the ties do not seem to have had any effect in reducing noise. The ties are of jarrah, an exceedingly hard fire-resisting wood. Part of the Piccadilly tube has been provided with ballast between the ties. This seems to have had an alleviating effect on noise reduction.

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Future Rolling Stock

From Viewpoints of Operator and Manufacturer

Growing demand by the American public for greater comfort and increased speed in transportation is leading to improved car designs. Low first cost and maintenance are nevertheless important factors in dictating types of future rolling stock

AN ANALYSIS of the factors which affect the development of future rolling stock was made in an article in last week's issue of ELECTRIC RAILWAY JOURNAL by Charles Gordon, editor. The following three articles present a further discussion of this subject, one by an operating executive who has had a leading part in the present movement toward the improvement of electric railway rolling stock, and two by representatives of leading car building companies. This material was prepared originally for presentation before the equipment division of the American Electric Railway Engineering Association at the Cleveland convention. Because of the great interest throughout the industry in the car situation this discussion of Mr. Gordon's article is printed here as a symposium.

Car Purchases Should Not Wait for Final Verdict on New Equipment

BY L. J. DE LAMARTER
Vice-President and General Manager
Grand Rapids Railroad

AS I ANALYZE Mr. Gordon's article, it is in the nature of a plea for co-operation and co-ordination of efforts to produce a proper design for future rolling stock. I agree that it should be within the province of the manufacturers to initiate the design and to build the cars, but in doing this they must consider the problems of the transportation industry and not merely the manufacturers' problems. In addition to the need of improved appearance, easy riding, quietness, fast acceleration and light weight for future equipment, other general requirements from the transportation department's viewpoint are covered by the report of the committee on service betterment which should be considered carefully in connection with this subject.

One point which I believe needs to be supplemented is the statement that "during the past eighteen months there has been a sudden further drop in new car orders which is now generally attributed to the fact that many properties are holding off needed purchases, while awaiting the outcome of recent experiments in design and construction."

As I see it, there are other governing factors which are also responsible for the reduction in cars sold during the past eighteen months. Some of these are as follows: (a) The volume of business during that period did not warrant the increase in investment which would be occasioned by the purchase of new cars; (b) Uncertainty during the past eighteen months as to when the gradual and continuing decrease in passengers carried throughout the country will stop, and (c) Uncertainty as to when the much-discussed privately-owned automobile saturation point will have been reached.

I feel that it is the combination of these factors with the one mentioned by Mr. Gordon that has caused the transportation executives to postpone the purchase of new equipment until the public riding habit becomes more stabilized. It is my belief, however, that if the car builders had undertaken the development cost and had been prepared to offer to the transportation industry fully developed, standardized cars which would meet present-day requirements, together with a satisfactory financial purchase plan, the sale of cars during this eighteen months period might have been greater.

A favorable sign that we are getting somewhere was indicated to me in an editorial I read recently in a Cleveland newspaper, which, in covering the convention, mentioned the fine exhibit of cars and buses, saying the street car designers were making their cars look like buses and the bus designers were building some of their buses to look like street cars. There is at least evidence here of an open mind on the part of some of the car builders, which promises ultimate success of the effort to develop cars that will actually attract passengers.

Regarding future rolling stock, I do not believe that we need to hold up car purchases now for further drastic change in design over the cars in the Cleveland exhibit. Refinements, pleasing color combinations and attractive lines will continue to be the aim of the car builders, which is in keeping with the order of the day, and improved trucks and other essentials to a modern car may be expected to come along gradually as experience increases with some of the new designs that are being tried.

Low First Cost and Maintenance Must Be Combined With Attractiveness

BY JAMES A. BROOKS
Chief Engineer The J. G. Brill Company

VERY strenuous efforts are being made to solve the rolling stock problem and produce more modern and attractive cars, but of the many innovations that are being tried, only those that measure up to the requirements of actual service, over a reasonable length of time, may be considered practical.

There has grown with the industry many variations

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in fundamental forms and dimensions for cars. It was thought a few years ago that the time had arrived when common fundamentals could be adopted to suit most of the conditions and thereby enable the car builder more nearly to approach mass production, with an ultimate saving to the purchaser.

A committee was appointed by the association to study the matter and determine upon these fundamentals, and immediately upon the completion of this work the demand arose for something radical and different. For this reason the co-ordination work failed of its purpose.

Previous to this, at the most critical period in the history of the industry, the Birney car, thousands of which were built and thousands of which are still in satisfactory operation, was manufactured in mass production due to standardization of fundamentals; and this car was the most outstanding car of all time, for it accomplished most of the things to be desired in rolling stock, which were: Economy in first cost and in maintenance, low operating cost due to exceptionally light weight, rapid acceleration, and one-man operation. As soon as this type of equipment had met the immediate crisis with which the industry had been faced, the desire for larger equipment became prevalent, and for the past several years modern double-truck light-weight cars have been used—almost to the exclusion of the four-wheel car.

The newly-developed types of motor buses, which appealed both in appearance and comfort, unquestionably placed the electric rail car at a disadvantage in the minds of the traveling public, particularly on lines operating cars that were very old, or on which maintenance had been deferred; and comparisons were made between the improved type of motor bus and antiquated car equipment. This brought about a trend in design of the electric rail car toward the motor bus and with it the introduction of comfortable seats and other improvements, and these alone, in many cases, have been responsible for improved service and increased riding. It is a fact that what the electric railways need most are new cars which will be inexpensive both to purchase and maintain.

The design and arrangement of the bodies of recent cars have been materially improved, and various types of propulsion are being experimented with. These, at the present time, can be considered only as experimental and will, most likely, remain in this state for some time to come.

It is unfortunate that in these new methods, which embody a combination of automotive and electric railway practice, the cost in many instances is greatly increased, without showing any particular advantage of the newer type. It may be, however, that from these will develop something that will accomplish many of the improvements for which the industry is seeking. In such an event, however, a simplification will undoubtedly have to be made, for the various equipments being experimented with have added complications and increased cost.

The car of the future must be of adequate size to meet the requirements of mass transportation and yet not be too large or too heavy to operate during the dull periods. In the matter of light-weight equipment care must be exercised that strength is not sacrificed beyond the point where there is a reasonable assurance that excessive maintenance will not offset the savings.

It appears that there may be two classes of rolling stock; one, where the passenger traffic is necessarily heavy and in which the quick movement of passengers is of more importance than luxury, and the other on lines where bus and automobile competition are more prevalent and where luxurious refinements must be provided to invite car riding.

Future rolling stock must be attractive in appearance, probably of the streamline sedan type, with particular attention devoted to exterior and interior decoration. It must be economical to purchase and maintain, including only those advanced ideas in design which offer definite and practical value. Designers are seeking simplification of control and braking, with sufficient power to develop an acceleration of approximately 5 m.p.h.p.s. and with brakes that will accomplish equally as fast retardation.

Co-operation Between Manufacturers and Operators Essential

By A. L. Kasemeier
Vice-President in Charge of Sales
Cincinnati Car Company

BEFORE we consider the type of future rolling stock, the reasons for advocacy of the replacement of existing equipment at this time should be determined. Both operators and car builders were on solid ground when the so-called obsolete equipment of yesterday was built and put in operation, for the universal 5-cent fare seemed unchangeable and the durability of rolling stock was of greater importance from the standpoint of operating costs than was that of luxury for the purpose of attracting additional patronage. There are today, however, two distinct reasons why a change in the type of rolling stock is desirable, if not absolutely necessary, if we are to maintain our position in the field of urban and interurban transportation. The first is the growing demand on the part of the American people for a greater display of luxury in transportation vehicles than for even the comforts of home. The second reason is that the electric railway car now has a real and formidable competitor in the cheap automobile.

I do not regard the bus or the expensive automobile as menaces to existing electric railway lines if we look with care to the future development of these properties. First thought should be given to the adoption of a car which will effect an increase in the net earnings of our properties, and, naturally, operating costs and passenger appeal are considerations of major importance. The passenger of today is in a position to change his means of transportation unless we offer a type of service that will attract and satisfy him.

I do not agree with Mr. Gordon that car builders have been trailing, rather than leading, in developing improved rolling stock, although I will admit that if we were consulted more freely and frequently before specifications are prepared by the equipment and operating officials, greater economy would result in original costs, and cars would be built more nearly to a standard which would be accepted and, in fact, welcomed by the bankers to whom we look for assistance in the marketing of securities. Electric railway credit and, consequently, operating costs would be vastly improved if we could get the investment banker to regard electric railway car trust securities as equal in security to those of steam roads; and this is possible of accomplishment if we would so standardize rolling stock that the banker could think of the value and mobility of the security (the car) rather than of the credit of the particular lines to which cars are leased.

There should be no rivalry between the builders of railway equipment and operating officials for leadership

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in designing cars, but rather the closest kind of co-operation. The car builder, by reason of his constant contact with market conditions and equipment and with operating officials of railways, is often in position to advise against the adoption of certain sizes of structural material, plates and even screws and bolts, because many of the old sizes of these things are not now standard with mills and jobbers and are, consequently, both difficult and expensive to obtain; and while he may be unwilling to criticize other features of railway specifications, he is in excellent position to do so for he hears complaints and often is blamed for appearance and unsatisfactory service of parts of the finished car for which he is in no wise responsible.

This question of closer co-operation between the operator and car builder is one of great importance to the industry, and the observations made and pointed out by Mr. Gordon of the growing tendency on the part of railway officials to vie with each other in an effort to become not only car designers but builders also should be considered with alarm. I do not question the ability of the equipment and operating officials to design and build electric cars, but two things will result if the practice continues. The first is that maintenance of the property now intrusted to their care will surely be neglected, and the second is that talent and capital now devoted to car manufacturing purposes will seek other fields of activity, and in either case the interests of the industry will suffer.

As modestly intimated in his address, Mr. Gordon has been most active in urging manufacturers to get busy in the development of cars to meet today's demands, but at the same time he very wisely has stated that: "Right now the manufacturers need active suggestions and co-operation." We have, naturally, always depended upon equipment men and operating officials for advice, and to them in a large measure is due credit for what has been accomplished in the present development. Much thought is being given by us to further improvements, and we will welcome any suggestions.

Mr. Gordon calls attention to the desirability of developing a distinctive car which could be sold as other manufactured products are sold. Our company has what might be termed a ready-made car, designed more than eight years ago, but flexible as to size, which we consider suitable for a wide range of operating conditions. This car embraces what we term the four features of balanced design, namely: Speed with safety, capacity with comfort, light weight with strength and beauty with low cost. The same construction and general design is used for both city and interurban service. The unit is built for speeds up to 60 m.p.h. and can be operated safely at the higher speeds by the installation of Duplex air-magnetic braking equipment. By the use of alloy steels and aluminum, and by careful balancing of all the elements of the structure, the weight has been reduced to a safe minimum.

I do not wish to be understood as saying there will be no further developments in car design, but I feel safe in asserting that future rolling stock will not depart radically in design from that which was exhibited at the Cleveland convention, and that further developments will be gradual and along lines to be determined by both operator and car builder. In the meantime, however, if a railway's equipment needs replacing because of excessive weight, low speed or lack of attractiveness, it should not wait for the seer to tell what the characteristics will be of cars five years hence.

Company and Department Awards in New Contest

ELECTRIC RAILWAY JOURNAL'S New Maintenance Contest includes several important features:

An attractive trophy will be awarded to the company making the greatest contribution to the improvement of maintenance practices through participation in the contest.

Special certificates of merit will be presented to each department making the best individual showing.

An individual cash prize of $200 will go to the person submitting the best maintenance idea during the contest.

A series of twelve individual prizes of $25 each will be divided equally between the following four maintenance divisions: (1) Rolling stock and shops; (2) way and structures; (3) electrical and line; (4) buses and garage, including shop equipment for bus maintenance.

A cash payment of $5 will be made for each item published.

Start at once and help your department and company to win the recognition they deserve for improved maintenance work. In addition you can win one or more of the valuable individual prizes.

See ELECTRIC RAILWAY JOURNAL for Oct. 20, pages 724-725, for complete details. An attractive folder giving full instructions and suggestions for preparing entries in the contest is available and will be mailed to those interested upon request.

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Pennsylvania Railroad To Be

from New York

$100,000,000 project will cover 1,300 miles of track and will require 365 new electric locomotives. Said to be largest electrification in world

Principal Facts

about Pennsylvania Railroad Electrification from New York to Wilmington, Del., and from Philadelphia to Columbia and Atglen, Pa.

Miles of railroad to be electrified	325
Miles of track to be electrified	1,300
Electric locomotives required for new operation:	
Passenger	165
Freight	200
Total new electric locomotives required	365
Electric locomotives now in operation	84
Number of passenger trains:	
To be operated by electric locomotives	318
To be operated as multiple-unit trains	218
Estimated cost to complete program	$100,000,000
Estimated time to complete program	6 to 7 years
Saving in number of freight trains operated	Approximately 50 per cent
Size of freight trains to be operated	125 cars
Speed of freight trains under electrified operation	25 m.p.h.
Miles of railroad already electrified (includes 140 miles Long Island Railroad)	333
Miles of track already electrified (includes 418 miles Long Island Railroad)	960
Total P.R.R. line mileage which will be operated electrically on completion of new program	658
Total P.R.R. track mileage to be operated on completion of new program	2,260

ELECTRIFICATION of the entire Pennsylvania Railroad between New York and Wilmington, Del., including both passenger and freight service, has been authorized by the board of directors of the Pennsylvania Railroad, according to an announcement by General W. W. Atterbury, president.

This project will require an estimated expenditure of $100,000,000 to be spread over a period of the next seven or eight years, at the rate of about $15,000,000 per year. Approximately 60 per cent of the total amount will be spent for catenary, transmission lines and substation construction and 40 per cent for rolling stock. This will be a normal percentage of Pennsylvania Railroad's improvement expenditures which have been averaging $70,000,000 a year. The proposed capital expenditures for electrification will make unnecessary certain other capital expenditures on this section of the railroad which would have to be made if electrification plans were not carried out.

The new project covers 325 miles of line and 1,300 miles of track. This authorization is part of a plan which includes also the electrification of the grades between the Susquehanna, Schuylkill and Delaware River valleys and Eastern terminals. According to present plans the first section to be electrified will be between North Philadelphia and Trenton, the next step between Newark and New Brunswick and the final section between New Brunswick and Trenton. At present the system is electrified between Long Island City and Newark and from Philadelphia to Wilmington. The latter section has just been completed.

Overhead construction and not third rail power supply will be used on this installation. Alternating current at 11,000 volts, single phase, similar to that now in use in the Philadelphia suburban service, will be adopted. Decision to use this type of system was made after a study of the systems now used extensively in Germany, Switzerland and Sweden and in this country on the New York, New Haven & Hartford, Norfolk & Western and the Virginian Railways.

In view of the fact that the suburban sections of the railroad will be electrified first, the purchase of cars will probably precede that of the locomotives. In the suburban service multiple-unit cars similar to those now in use on the Paoli division at Philadelphia will be used.

The through freight and passenger service will be handled by electric locomotives of a type recently developed by the electric railway manufacturers. Three types of these locomotives have been developed, one for high-speed passenger service, one for high-speed freight service and one for switching. When used singly or in multiple, as required, these locomotives will provide any power demanded by the weight or speed of a train. They will be so designed as to permit the maximum interchangeability of parts, the minimum cost of maintenance and the simplest and most direct method of manufacture. By the method of operation proposed it is expected eventually to reduce the number of freight trains 50 per cent for a given car movement and to increase the speed to any reasonable extent required. This of itself provides for a 100 per cent increase in capacity in so far as freight movement is concerned. In the case of passenger trains it is expected to eliminate all double-heading and most if not all of the second sections of trains, and to avoid the possibility of rough handling due to limited

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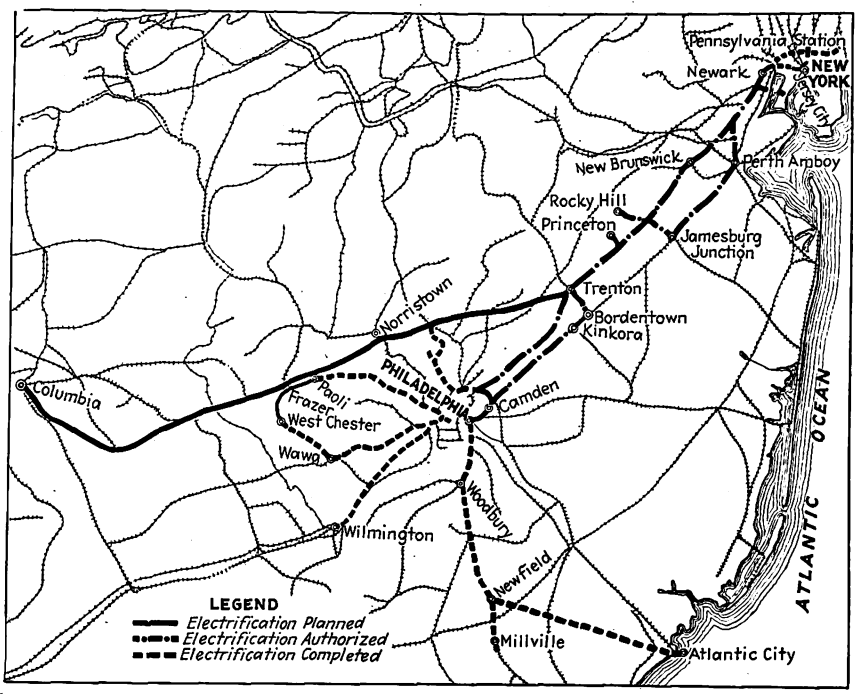
Electrified

to Wilmington



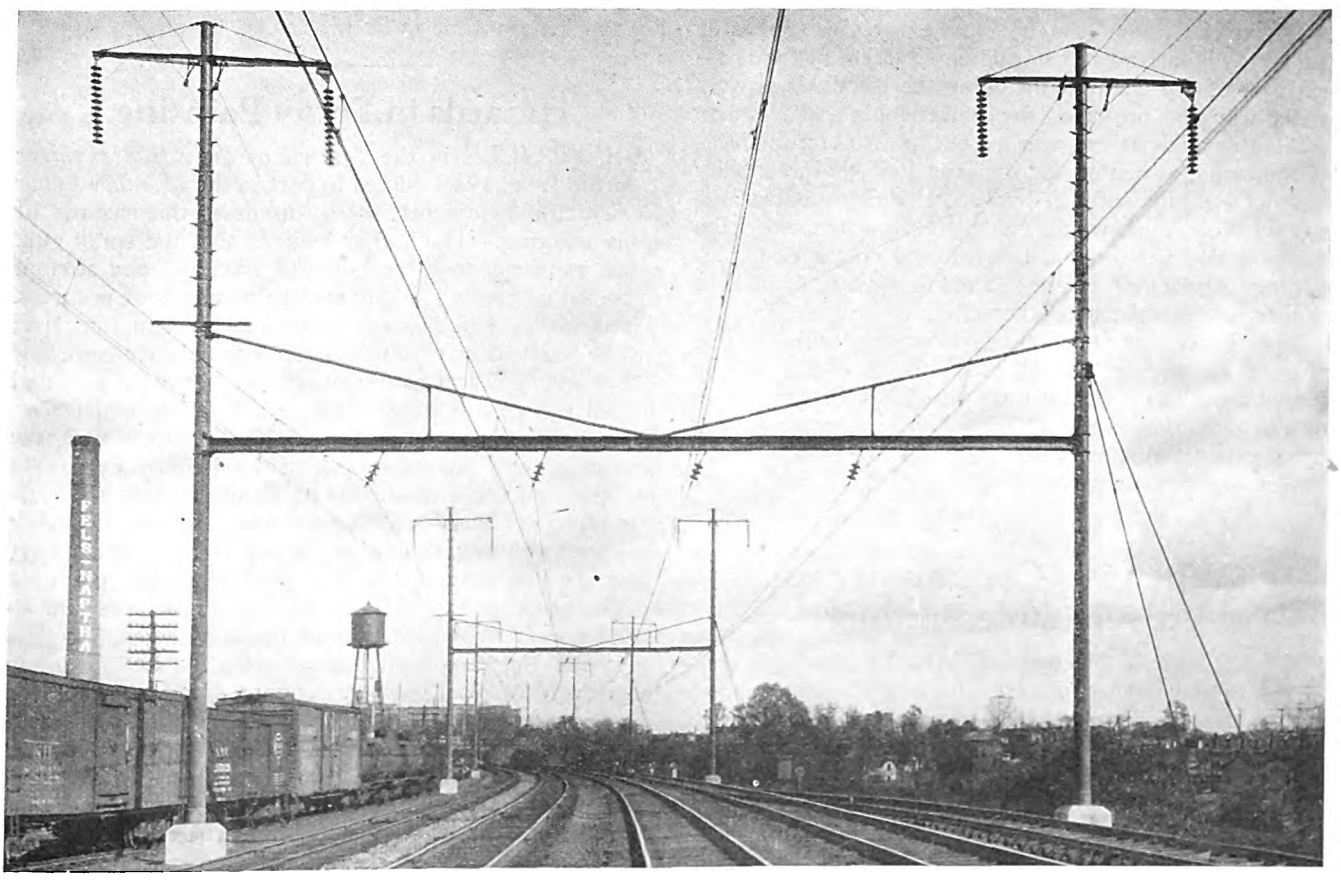
Map of proposed, authorized and completed electrification of Pennsylvania Railroad. This does not include the Long Island Railroad

starting capacity, all of which makes for greater comfort, better service and increased capacity of lines.

Immediate Factors Which Influenced the Decision

The immediate factors which influenced the decision to proceed with electrification at this time were as follows: greater economy of electric operation as compared with steam operation in dense traffic territories; the growth of the southern passenger business; the increasing density of both freight and passenger business on the Eastern lines of the railroad and the probability that in the future more rapid movement will be required; the desirability of utilizing the advantages of electric operation in connection with the construction of the new passenger terminals at Philadelphia and Newark; the desirability of providing motive power that would meet the growing requirements from the standpoint of weight of trains, speed and reliability. The probability that the project, if started now, would be completed with a less total expenditure, all matters considered, than if started at a later date, was another factor in the present move.

Of the 365 electric locomotives required eventually for this electrification, from 250 to 300 will be purchased within the next five years. Arrangements have been made for the Pennsylvania Railroad to purchase power from the Public Service Corporation of New Jersey and the Philadelphia Electric Company.



Catenary bridge spanning five tracks on the Wilmington section

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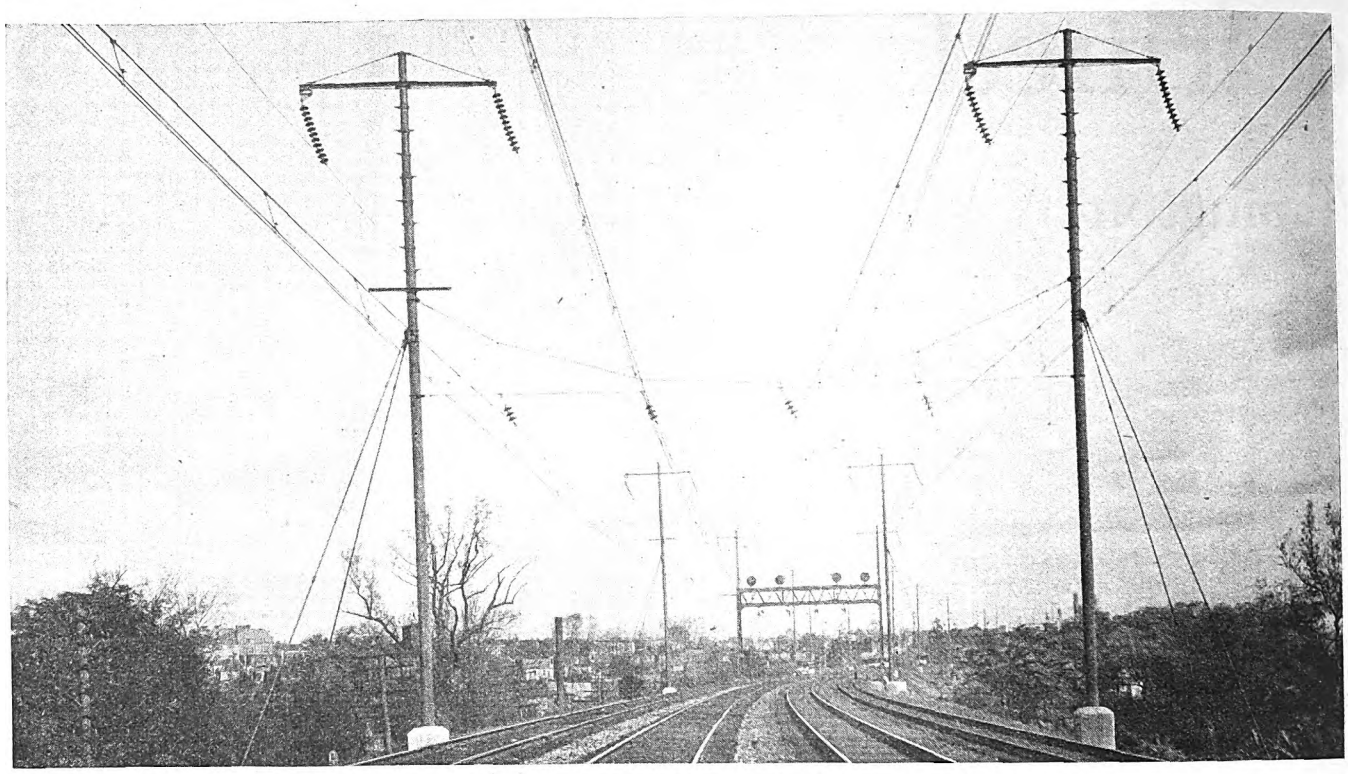

View along the Wilmington line, electrification of which was completed recently

This electrification is claimed by the railroad officials to be far greater in magnitude and importance than that of any other railroad in the world in miles of track to be electrified, in volume and density of passenger and freight business handled, in size and amount of equipment required, in the number of trains affected, and in terminal operations involved.

The authorization resulted from exhaustive studies of the whole industrial transportation situation in the Eastern part of the country, including the terminals already under way and projected for Philadelphia and Newark. While this analysis was worked out in detail on the basis of the traffic estimated for the year 1935 the probability was not lost sight of that by 1950 the metropolitan area around New York would extend to New Brunswick on the west and well out on Long Island on the east, containing 30,000,000 people; and that there would be similar developments in other cities.

The next electrification development will be that already planned on the Philadelphia division, Trenton branch, to Pomeroy, and thence to Columbia, as shown on the map on page 807. This will probably be followed by electrical equipment of lines in and around Pittsburgh, eventually to be connected with the Eastern lines.

When is a Community an Advertisable Product?

"WITHOUT adequate public utility service a community is not a successful advertisable commodity, in the same sense that food without flavor is not a successful advertisable commodity. As a community's public utility service is good or bad, so in like degree is that community a comfortable, convenient and satisfactory (or the contrary) place in which to live and do business." In these words A. H. Herrmann, publicity director of the Virginia Electric & Power Company, Richmond, Va., addressed the Richmond Advertising Club at a weekly meeting held recently. He stressed the newspaper as the most effective medium for public utility advertising.

After giving a résumé of the advertising budget of the electric railway industry, Mr. Herrmann stated that his company was spending more money today for advertising than at any time in its history.

Hazards in Spray Painting

AN ARTICLE in the *Journal of Industrial Hygiene* for June, 1928, quoted in part in the *Monthly Labor Review* for September, 1928, discusses the hazards of spray painting. The author believes that the spray gun, as an industrial tool, has come to stay, and any attempt to forbid its use will simply arrest the wheels of progress. There are certain hazards in its employment, but they can be lessened or eliminated with comparative ease.

Periodic physical examinations are regarded essential for all workers in spray painting within inclosed places. Where the compound used contains lead or benzol, the person should be examined at least once every six months, and these examinations should include the various blood cell counts. Persons using siliceous materials in spray painting should be examined and should have X-rays of their chests made at least every two years.

The principal faults found in commercial spray installations were in the location of the spray booth, method of use of the equipment, lack of cleanliness, poor design and inadequate air supply. Indoor spraying should be done in a properly constructed booth with exhaust ventilation. The face area of the booth should be from four to eight times the area of the object being sprayed, and wide booths should have multiple fan installations or a large exhaust fan. The booth should be cleaned periodically, and walls and ceilings should be greased or papered, or both. Fans should be located in the rear or sides of

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the booth and preferably low, as most of the harmful substances in the paint give off heavy vapors or heavy solids. The air to supply the fan should be fresh, and preferably from the outside.

Transportation Prominent at West Virginia Meeting

In a stirring address, J. P. Barnes, president of the American Electric Railway Association, bespoke a new trend of thought for the industry. A. C. Spurr new president

SEVERAL subjects of interest to electric railway representatives were included in the program of the eleventh annual convention of the Public Utilities Association of West Virginia, held at Huntington, W. Va., Oct. 24-25, 1928. Among these were "The Utility's Responsibility to the Public," "The Trend of Transportation," "Public Utility Safety," "Improving Foremanship" and "Structural Rate Making."

The keynote for electric railway men was struck by J. P. Barnes, president of the A.E.R.A., who urged that all agencies of local transportation be considered a part of one system, serving one public, but giving the various classes of service demanded by the public of today. He made an appeal for more fundamental thinking and a broadened conception of the important problems of community transportation and traffic congestion, to conform to changed conditions in modern cities.

"The world has stepped on the gas and is going somewhere. Are we going too?" With these words, Mr. Barnes issued a bold challenge to the industry. The paper is published, in full, elsewhere in this issue.

"The Utility's Responsibility To the Public," was the subject of an address by G. M. Alexander, president Monongahela-West Penn Public Service Company. Because the public has granted franchises to operate and in many instances is a part owner of the business, Mr. Alexander asserted, it has the right to expect that the utility officials be men of good conduct in private life. Speaking of return he said, "I don't believe the public is so seriously concerned with rates and fares as we think, if we satisfy the demands of service. The rates must be just to the public and to ourselves in order to give the public the service expected."

"Honesty, absolute and scrupulous, not merely legal honesty," was listed by the speaker with other requirements for successful utility operation. Another was the caution against making any promises that cannot be fulfilled within the expected time.

Man Power Important Weapon

C. I. Weaver, vice-president of the Ohio Edison Company, Springfield, Ohio, speaking on "Man Power," said that this is by far the most important available tool or weapon of the utilities. Courage, intelligence and ambition are among the qualities to be sought in new employees. "If we are to guard our man power we must watch the office boy."

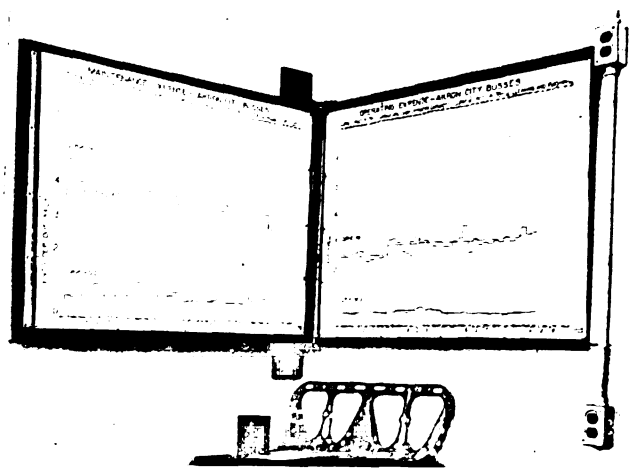
An address on "Public Utility Safety" by Fred A. Lange, Ohio Department of Safety, dealt principally with the light and power industry. He said that the iron and steel industry is inherently more hazardous than the light and power industry yet by personal effort on the part of high officials one concern, the Lorain Steel Company, has completed 3,000,000 man-hours without an accident, as compared with an average of 48 accidents per 1,000,000 man-hours in the light and power industry. To officials he addressed this final remark, "You men who are the managers—it is not sufficient to put someone in charge of safety, you must take a personal interest."

N. M. Argabrite, vice-president American Gas & Electric Company, dealt with fundamentals of "Structural Rate Making." He showed that because readiness-to-serve and per-customer costs may total to ten times or more the actual manufacturing cost, energy may be sold to one customer for 1 cent at a profit and to another for 10 cents but at a loss.

Arthur M. Hill, president of the association, presided at the meetings. He is vice-president of the Charleston Interurban Railway and president of the Blue & Gray Transit Company. Officers for the ensuing year are: president, A. C. Spurr, general manager Wheeling Traction Company; vice-presidents, W. F. Ficklen, manager Appalachian Power Company; C. H. Hardesty, assistant to president Monongahela-West Penn Public Service Company; Fred M. Hawley, treasurer Bluefield Telephone Company; executive secretary, A. Bliss Crum, Charleston; treasurer, G. B. Moir of the Appalachian Power Company, Charleston; and assistant treasurer, J. W. Cummins, assistant treasurer Charleston Interurban Company.

Hinged Wall Charts An Aid To Meetings

LARGE wall charts that are clearly visible from any point in the conference room are being found invaluable for reference purposes during foremen's meetings of the Northern Ohio Power & Light Company in Akron, Ohio. These charts have been made 30 in. high and 40 in. long, and have been mounted on sheets of veneer boarding which are hinged to a wall holder by means of rods running through metal loops at top and bottom of the frame.



The charts on this rack can be removed readily for current additions

Charts showing pertinent information such as mileage maintenance or operating expenses can be plainly displayed. By removing the thumb tacks the sheets can be removed for replacement or changes.

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nance Man

The idea of cutting out the bent section of the pole and welding in a new piece of tubing seemed to be the logical way of performing the job.

The strain on the pole was in three directions, the main messenger running north and south, and a span wire and pull-off wire to the west. To distribute the strain evenly all around the pole, a temporary strain guy was installed to the east. Then, of course, the strain was only a down thrust.

First one of the company's standard crossarm brackets was put around the pole so that the load, when the bent section was cut out, would rest on top of a temporary wooden pole lashed to the steel pole. The bent section was then cut out and a new piece of tubing 5 ft. long was welded in place. The accompanying illustrations show various stages of the work. The sleeves used are the same as the standard sleeve used in pole reclamation by the railway. The total cost of labor and material for the job was $67.87.

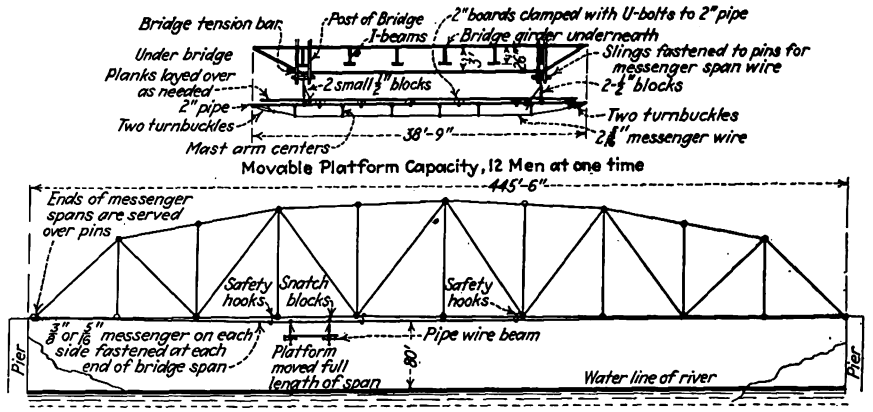
Cleaning and Painting Underside of Railway Bridge*

By Thomas O. Smith
Superintendent of Overhead Charleston Interurban Railroad, Charleston, W. Va.

CLEANING and painting the understructure of a bridge on a line of the Charleston Interurban Railroad, Charleston, W. Va., was done successfully by constructing a movable platform and attaching it to two messenger wires running the length of the bridge underneath. The platform was moved from one position to the next by sliding the snatch blocks, to which ropes fastened to the scaffolding were attached, along the messenger wire. When located, the platform was pulled up to working position and safety slings were attached to the bridge beams as found most convenient.

The side members of the platform were constructed of 2-in. wrought-iron pipe with mast arms hanging down. A $\frac{5}{16}$-in. wire attached to either end of the wrought-iron pipe passed through the ends of the mast arms and was tightened by turnbuckles. There were two of these structures, one on either side. The mast arms were spaced 5 ft. apart and 2-in. boards were used for the flooring of the platform and were fastened to the 2-in. pipes by U-bolts. The size of the platform was 38 ft. 9 in. x 42 ft. 9 in. and had a capacity of twelve men.

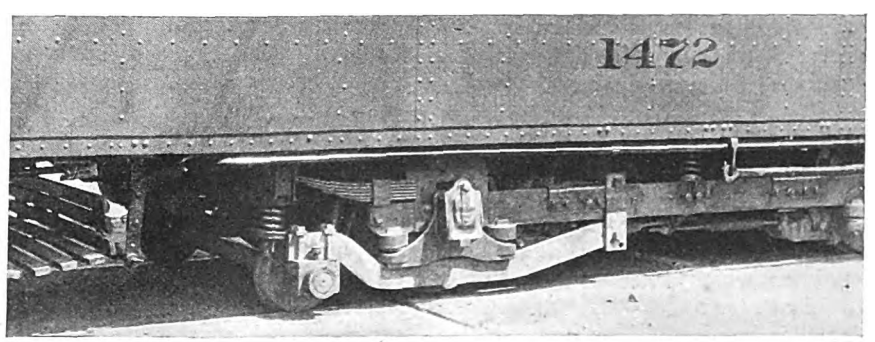
The messenger wire that supported the platform was run underneath the bridge from end to end and was tied to bridge pins. Other safety slings were tied to the bridge arms as found most convenient and safety hooks were fastened to the messenger wires at either side of the platform. By

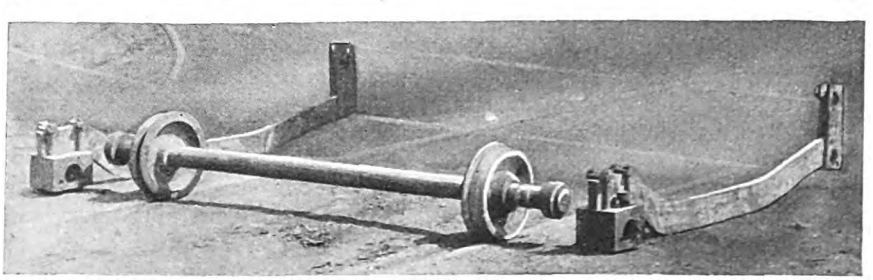


Above, crosswise view of the platform and attachment. Below, longitudinal view showing how messenger wire was attached to provide easy movement of the platform

Dolly Truck for Broken Axle

FOR bringing in crippled cars of the single-truck type when an axle is broken, the Virginia Electric & Power Company has developed the so-called "dolly truck," shown in the accompanying illustrations. It consists of nothing more than two side bars and an axle fitted with a pair of small wheels, and can very easily be attached to the end of the truck frame. The two side bars fit underneath the journal box pedestals, being bolted at one end to the side frame of the truck. The other ends rest on a pair of bearings on the outside ends of the dolly axle. The two pictures tell the story.





Above, the dolly truck under a car. Below, the truck dismantled.

Submitted in Electric Railway Journal Prize Contest.

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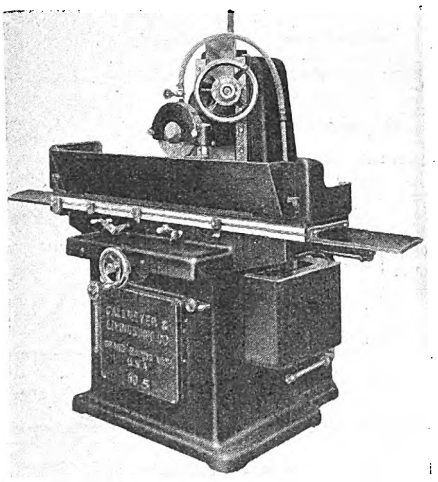
Improved Equipment Suggestions

Hydraulic Feed Surface Grinders

DESIGNED for more rapid grinding and higher capacity are two hydraulic feed surface grinders, equipped with oil gear, products of the Gallmeyer & Livingston Company, Grand Rapids, Mich. The oil gear mechanism makes possible any longitudinal table speed up to 55 ft. per minute. The feeds may be set slow enough to require nine



No. 5 hydraulic feed surface grinder

hours to cover the working surface of the table or they may be set to enable the operator to cover the entire working surface of the table in 3½ minutes. The oil gear hydraulic feed reciprocates the table at a variable rate of travel and is connected to a cross-feed engine mounted under the saddle, arranged so that at each reversal of the reciprocating table it actuates the cross-feed mechanism.

For raising and lowering the wheel head a large hand wheel is used. This gives a direct action through a worm gear to the elevating screw. The wheel is graduated in one-quarter thousandths with a movable pointer which can be set for convenient readings. By turning the smaller hand wheel or knurled hand knob in the center of the large wheel, a back-geared action to the elevating mechanism is provided. The disk in the center of the hand wheel has a graduated dial ring which can be set at zero in relation to the pointer mounted on the spoke of the large hand wheel. Both inner and outer wheels turn but the graduations on the inner wheel are arranged to read on this moving pointer, giving a Vernier effect. By this it is easy to get readings of adjustments in ten-thousandths. With this sort of graduation and an accuracy in the machine that makes this available in service it is possible to increase greatly the accuracy of work turned out by surface grinding.

Operating Conditions Affect Spark Plugs

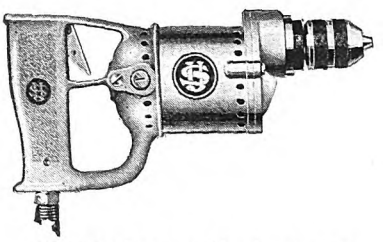
SOME reasons why one bus or truck can operate a greater mileage without spark plug trouble than another are explained in a service bulletin recently issued by the A. C. Spark Plug Company. It states that some buses operate at low speeds in towns, stopping frequently and with the engine idling for long intervals, while others are used for intercity highway transportation and carry heavy loads and operate at high speed.

The compression in an engine varies with the opening of the throttle and the speed attained. So in the case of a bus or truck driven in town, there will be little chance to open the throttle wide for any length of time, to get the full benefit of the high compression of the engine. If the same vehicle is run in the open country at a sustained high speed, the explosive temperature will be far higher than in the previous case and the revolutions of the engine will double or treble. For such service spark plugs have to withstand a higher combustion gas temperature and dissipate several times more calories, due to the increased number of explosions per minute resulting from the higher speed.

If a bus or a truck operating on long runs at fast speed is equipped with the same type spark plug as a bus or truck in city service, it will be difficult for the plugs to stay cold enough to prevent pre-ignition. A cooler constructed type of plug which will withstand more heat should be used in such a case. Weather temperatures have an important bearing on spark plug service. Spark plug recommendations as shown on specification charts are based on average operating conditions but to get maximum service from abnormal driving conditions, a spark plug must be obtained that is suitable for the particular condition involved.

High-Speed Portable Electric Drill

TO MEET a growing demand for a higher speed light-weight ¼-in. portable electric drill the United States Electrical Tool Company, Cincinnati, Ohio, has two in regular production. One of these, known as the ¼-in. special direct drive drill, operates directly on the armature shaft at a speed of 10,000 r.p.m. and weighs only 4 lb. The other, known as the ¼-in. special gear reduction drill, operates at 2,000 r.p.m. and is only ⅛-lb. heavier.



New ¼-in. portable electric drill

New features on these drills include keyless chucks and easy accessibility to close places. Both have universal motors that operate on either alternating or direct current.

Light-Weight Headlining

A NEW headlining with an aluminum face is announced by the Haskelite Manufacturing Corporation, Grand Rapids, Mich. The new product is made of Haskelite plywood faced with aluminum and results in a much stronger headlining with less weight than the usual materials employed.

The new lining consists of No. 27 gage aluminum sheet glued to a three-ply back of Haskelite plywood. The plywood recently developed has two faces of $\frac{1}{32}$-in. spruce and a $\frac{1}{32}$-in. poplar core, but walnut and mahogany can also be used for backs. The total thickness of the aluminum-Plymetl, including the aluminum, is 0.108 in. and the weight factor is 0.510 as compared with 0.715 for No. 16 gage aluminum which is ordinarily used. The stiffness of the new headlining is also much greater.

With No. 16 gage aluminum, the stiffness factor is 109.6 while that of the aluminum-Plymetl is 375 longitudinally and 145 transversely.

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American Association News

Engineering Standing Committees Complete

STANDING committees of the power, purchases and stores, rolling stock and the way and structures divisions of the Engineering Association have been completed. These are the continuing groups which have charge of the committee work of the four principal divisions of the association. The personnel follows:

Power

W. E. Bryan, superintendent of power St. Louis Public Service Company, St. Louis, Mo., chairman.
W. H. Bassett, Waterbury, Conn.
L. W. Birch, Mansfield, Ohio.
C. A. Butcher, East Pittsburgh, Pa.
H. A. Kidder, New York, N. Y.
John Leisenring, Springfield, Ill.
J. F. Neild, Toronto, Ont., Canada.
F. W. Peters, Schenectady, N. Y.
W. J. Quinn, New York, N. Y.
J. L. Ross, Pittsburgh, Pa.
Dwight L. Smith, Chicago, Ill.
L. J. Turley, Los Angeles, Cal.

Purchases and Stores

A. A. Ordway, Boston Elevated Railway, Boston, Mass., chairman.
John Y. Bayliss, Richmond, Va.
A. S. Duncan, East Pittsburgh, Pa.
A. L. Fischer, Cincinnati, Ohio.
J. Fleming, Washington, D. C.
B. W. Forkner, Mansfield, Ohio.
A. E. Hatton, Pittsburgh, Pa.
F. A. Jordan, Atlanta, Ga.
E. A. Murphy, Indianapolis, Ind.
W. E. Scott, Philadelphia, Pa.
C. Thorburn, Los Angeles, Cal.
W. J. Walker, Schenectady, N. Y.

Rolling Stock

A. T. Clark, superintendent of rolling stock and shops United Railways & Electric Company of Baltimore, Baltimore, Md., chairman.
R. S. Bull, Pittsburgh, Pa.
V. W. Berry, Richmond, Va.
C. Bethel, East Pittsburgh, Pa.
W. C. Bolt, Chelsea, Mass.
J. M. Bosenbury, Springfield, Ill.
James A. Brooks, Philadelphia, Pa.
M. R. Hanna, Erie, Pa.
J. S. McWhirter, New York, N. Y.
A. D. McWhorter, Memphis, Tenn.
T. H. Nicholl, Anderson, Ind.
R. B. Smyth, Boston, Mass.

Way and Structures

E. M. T. Ryder, way engineer Third Avenue Railway, New York, N. Y., chairman.
C. A. Alden, Steelton, Pa.
C. H. Clark, Cleveland, Ohio.
E. B. Entwisle, Johnstown, Pa.
C. L. Hawkins, St. Louis, Mo.
William G. Hulbert, Easton, Pa.
John R. McKay, Fort Wayne, Ind.
C. A. Smith, Atlanta, Ga.
A. T. Spencer, Montreal, Que., Canada.
J. H. Sundmaker, Cincinnati, Ohio.
F. B. Walker, Boston, Mass.
Oscar Williams, Pittsburgh, Pa.

Aluminum and Its Alloys in Car Construction

Material saving in weight and no indication of corrosion have been shown in 368 cars built for steam railroads and 108 for electric railways, largely of aluminum or its alloys

ONE of the features of the meeting of the metropolitan section of the American Electric Railway Association, held in the Engineering Societies Building in New York, on Oct. 5, was an address on "Aluminum and Its Use in the Transportation Industry." The speaker was Dr. Paul V. Faragher of the Aluminum Company of America. After giving an account of the methods of producing aluminum and its alloys, particularly duralumin, he gave a list of the cars for steam and electric railroads in which these materials had been used extensively. The list follows:

Illinois Central Railroad has 25 cars that were built in 1923 for its Chicago Terminal. The outside roof sheets, doors, interior finish sheets, conduit and junction boxes are of aluminum. The total weight of each car is 87,500 lb. and the weight saved, 4,700 lb. The service given has been suburban, three years with steam and two years with electricity. The condition of the aluminum is satisfactory, with no indication of corrosion. In addition, the same company has 215 cars that were built in 1926, the same parts as before being of aluminum. The total weight of the motor cars is 140,000 lb. and the weight saved, 10,150 lb. The total weight of the trailer cars is 88,700 lb. and weight saved, 7,763 lb. These cars have been in electric suburban service for two years. Here also the condition of the aluminum is satisfactory.

Pennsylvania Railroad has eight cars built in 1926 for its Paoli suburban branch. Here the entire superstructure except the belt rail is of aluminum. The total weight of each car is 111,270 lb., and the weight saved, 16,100 lb. These cars have been in electric suburban service for two years. Here the condition of the aluminum is satisfactory, the only corrosion being due to the welding flux left on after the roof sheets were welded. There is no indication of atmospheric corrosion.

Chicago & Northwestern Railroad had 120 cars built in 1927 for its Chicago suburban service. The exterior roof sheets, side girder and letterboard sheets, interior finish, bulkheads, doors and all miscellaneous sheets are of aluminum. The total weight of each car is 98,300 lb. and the weight that was saved 7,000 lb. These cars have been one year in steam suburban service. The condition of the aluminum is satisfactory, and there is no corrosion.

Cleveland Railway had one car built in 1926. All metal in the car with the exception of the side sills, wheels, axles, springs, bolts, rivets and similar material is of aluminum. The total weight of the car is 30,300 lb. and the weight saved is 12,901 lb. This car has been in city service for two years, covering during that time approximately 80,000 miles. Part of the time it has drawn a trailer. The condition of the aluminum is satisfactory.

Chicago & Joliet Electric Railway has one car, built in 1927. All metal in the car body and equipment is of aluminum with the exception of the bolts, rivets and similar parts. No aluminum was used in the trucks. The total weight of the car is 23,722 lb. and the weight saved, 11,500 lb. This car has been one year in city service, covering approximately 40,000 miles. The condition of the aluminum is satisfactory, with no corrosion.

United Railways of St. Louis has one car, built in 1927. Aluminum is substituted in the underframe and car body for steel, with the exception of the bolsters and miscellaneous minor parts such as bolts, rivets, etc. The weight of the car is 32,000 lb. and the weight saved, 5,332 lb. This car has been in service for one year, covering approximately 30,000 miles. The condition of the aluminum is satisfactory with no corrosion of any kind.

Montreal Tramways has ten cars, built in 1927, using aluminum in place of steel for all underframe members and metal work in the car with the exception of bolts and rivets. There is no aluminum in the trucks. The weight of the car is 37,100 lb. and the weight saved, 3,700 lb. This car has been in normal street car service in Montreal for one year. The condition of the aluminum is satisfactory, with no corrosion. The company also had 40 cars built at the same time as the one mentioned, in which aluminum replaced sheet steel in the body only. The total weight of each of these cars is 35,900 lb. and the weight saved was 1,200 lb. Here the condition of the aluminum is satisfactory. The same company had 30 cars built in 1928 with the same aluminum as in the above 40 cars.

Twin City Rapid Transit Company, Minneapolis, Minn., had 25 cars built in 1927 in which aluminum was used for all metal work except the underframes. The total weight of the car is 27,670 lb. and the weight saved was 2,618 lb. These cars have been in city operation for one year in Minneapolis and St. Paul. The condition of the aluminum is satisfactory with no indication of corrosion.

Pittsburgh Railways has two trucks, built in 1927, with aluminum used for all parts except the arch bars. The total weight of each truck is 1,100 lb. and the weight saved was 856 lb. These trucks have been in service for one year under street cars in Pittsburgh. The condition of the aluminum is satisfactory with no indication of corrosion.

Commenting on the future possibilities of light metals, the speaker said that the only means of producing structural sections in aluminum and its alloys up to the present time has been by the exclusion process, by which only small sections have been available. It is expected, however, that in a mill now under construction it will be possible to produce large structural plates by rolling, and in the not too distant future to be able to roll a channel 85 ft. long.

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News of the Industry

Buffalo Fares Before Court

Federal Judge John R. Hazel in United States District Court at Buffalo has reserved decision on the application of the International Railway, Buffalo, for permission to amend its bill of complaint filed in 1926 to increase its fares in Buffalo, Niagara Falls and Lancaster. The court also reserved decision on the counter motion of the city of Buffalo to dismiss the original complaint on the grounds that it is not within the jurisdiction of the federal courts and should be referred to the New York State Public Service Commission.

Henry W. Killeen, appearing as counsel for the railway, told the court that the action was brought into the Federal District Court mainly because the Public Service Commission had previously refused to make a valuation of the company's property. He charged that the utilities board had done this in face of adverse decisions of the Supreme Court. The company also contended that the present rates of fare are confiscatory and under the constitution it has a right to bring its case before the federal court rather than before a regulatory body like the Public Service Commission.

The International Railway seeks to charge a 10-cent fare on local lines within the city of Buffalo instead of the present fare of three tokens for 25 cents, and to increase local fares in Niagara Falls and Lancaster from the present rate of 5 to 8 cents, with two tokens for 15 cents.

Russell B. Burnsides, representing the Public Service Commission, opposed the efforts of the railway to bring the fare case into the Federal District Court. He pointed out that since the original complaint was filed with the utilities board, fare increases have been granted in Tonawanda, North Tonawanda and Lockport. He said that as far as Buffalo is concerned the commission has granted the company an increase and this higher fare has been acceptable to the company and that no application has been filed by the company with the commission to review the need for another fare increase.

Hearings on Electrification in Atlanta Expected

One hearing has been held in Atlanta, Ga., on the proposed electrification of main trunk line railroads now operating into that city and others are to be held in the near future by the bridge committee of the Atlanta City Council. Representatives of railroads and interested citizens are to be permitted to present their views on the ordinance intended to eliminate the smoke nuisance in the downtown section. Electrification of the roads in the downtown section has been under consideration for some time. It is hoped that some tentative plan will result from the present conferences.

Rochester Line Reduces Price of Books

The Rochester & Eastern Lines of the New York State Railways, Rochester, N. Y., has announced reductions on the suburban line. The reductions concern both the 54-trip commutation books, which are good for 32 days, and the 46-trip school ticket books, which are good until used except during the months of July and August. The proposed reduction will effect a saving of from $1 to $20 per book. The change in commuters' rates is an experiment and the volume of traffic under the reduced fare will be checked to see if commuters actually take advantage of the cheaper rates.

Without Jurisdiction to Approve Purchases

The item was in error which was published in ELECTRIC RAILWAY JOURNAL for Oct. 27, page 778, to the effect that the Ohio Public Utilities Commission had ruled that no contracts involving the lines of the Youngstown Municipal Railway may be entered into without the approval of the local city street railway commissioner. As a matter of fact, the issue did not come before the commission, and it has no jurisdiction over such matters, which under the home rule situation in Ohio come under the jurisdiction of the City Council. Neither was such decision made by any court, commission or official of competent jurisdiction.

The issue was raised by the local street railway commissioner at Youngstown before the City Council and was referred by that body to the City Law Director and the Council's railway committee. The Law Director at the meeting of the Council on Oct. 29 rendered a written opinion in which he ruled that the city street railway commissioner did not have authority to approve purchases.

The Youngstown Municipal Railway franchise in Youngstown does not give the commissioner any such right to approve purchases and the commissioner has never exercised any such prerogative. To do so would, of course, place the commissioner, a political appointee, in the position of purchasing agent of the company without any responsibility to the management or to the owners.

Final Plea for Approval of Omaha Franchise

The proposed franchise for the Omaha & Council Bluffs Street Railway, Omaha, Neb., will be voted upon at the general election on Nov. 6. The terms of the franchise were agreed upon after long study by the city commissioners and the city's corporation counsel. The franchise in full is being published as a paid advertisement in the newspapers so that every phrase and every clause and every sentence can be studied at leisure. In a final word on the matter the company says:

> In every way, the people of Omaha have been safeguarded and their rights preserved. The company is content with the terms, provided the franchise is approved, for approval is needed if the railway of Omaha is to be permitted to extend its financing and develop its property.
>
> We have been told by many people that our efforts to make the service suit the needs of the city, our efforts to give courteous, efficient, regular tramway service, are appreciated. We believe that an efficient railway system is one of the biggest assets a city can have.
>
> We know that traffic and transportation engineers agree that trolleys cars propelled on fixed routes over steel rails must ever be the backbone of any city's transportation system. We know nothing comes so near the daily routine of the worker and the shopper as the street car.
>
> We ask Omaha to approve the proposed franchise. We pledge Omaha, at all times, the very best street car system it is possible to give; the best, the safest, the most courteous, the most efficient.

Reference is made elsewhere in this issue to the free bridge proposal before the voters.

Riding Holds Up in Hamilton

Three months' experience with a higher fare in Hamilton, Ontario, has shown no decrease in patronage, according to the Canadian *Financial Post*, which recently described the fare and jitney situation in the city. The railway, operated by a subsidiary of the Dominion Power & Transmission Company, was authorized in a recent finding of the Ontario Railway & Municipal Board to provide for a cash fare of 7 cents, four tickets for 25 cents and children's fares at ten tickets for 25 cents and to provide a new wage scale. Reference was made in these pages at that time to another live topic, the jitney. A lower court had declared that the jitneys were operating illegally and that pending the findings of this court on an appeal they continued to operate. The Dominion Power is contending that it has an exclusive franchise for carrying passengers, other than in taxicabs, within the city limits. Meanwhile the jitneys continue to operate.

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New Fare Schedules on Schenectady Line

A new joint passenger tariff for the Schenectady Railway in connection with United Traction Company and Capitol District Transportation Company, Inc., provides for sale and use of a twenty-coupon school ticket good between Schenectady and Albany, N. Y., and between Schenectady and Troy for $5. It also provides joint ticket fares of 50 cents one way and 84 cents round trip, between Schenectady and Albany and between Schenectady and Troy.

At the same time the Schenectady Railway has had cancelled its joint 50-trip commutation ticket fare in connection with the United Traction Company and Capitol District Transportation Company, Inc., between Albany and Schenectady, Stanford and Van Heusen and between Troy and Schenectady, Morgan Avenue and Niskayuna. These changes are effective Nov. 18, 1928.

Provision has also been made on the Schenectady Railway line for sale and use of a twenty-coupon school ticket book, good between Schenectady and Ballston Spa for $5, and a like book between Schenectady and Saratoga for $7. New ticket fares effecting reductions from cash fares are in force between Schenectady and Ballston Spa, and between Schenectady and Saratoga. The time limit on commutation tickets (50-rides) has been changed from 30 to 60 days from and including date of sale.

San Francisco Protests Trade Commission's Act

The Federal Trade Commission, through its local representatives in San Francisco, Cal., has requested the Citizens' Transportation Committee to open its campaign receipts and expenditures to their inspection. This request has been denied. Furthermore, President Coolidge has been requested by the San Francisco Chamber of Commerce to direct the Federal Trade Commission to confine itself to matters over which it has jurisdiction and not to interfere with the local political battles. The president of the chamber declared that the commission's action in directing its local agents to inquire into the activities of the Citizens' Transportation Committee and the various organizations sponsoring charter amendment No. 24 is "strongly and widely resented." The president, Mr. Fay, said:

This demand of the Federal Trade Commission has been given wide newspaper publicity here for purely propaganda purposes. We wish to protest to you this interference by an agency of the federal government in a matter of a local election on a question of purely local concern to San Francisco. The attempted interference by the Federal Trade Commission in a matter that does not concern the federal government in any way is strongly and widely resented. We accordingly request that appropriate action be taken to direct the representatives of the Federal Trade Commission to confine themselves to matters over which the Federal Trade Commission has jurisdiction.

Vice-President Burt Hamerstrom of the Market Street Railway, in answer to Supervisor Havenner's statement that the company's expenditures for advertising and publicity had jumped from approximately $5,000 in 1925 to $70,000 in the last year, freely admitted the figures. He said:

When the present régime took over the direction of the Market Street Railway, it was agreed that the receipts must be increased. Two ways naturally suggested themselves. The first, to raise fares, was rejected as it might have resulted in a decrease because of public resentment. The other method was adopted. This plan is simply to sell our service. We realized that to get satisfied patrons we must give good service, so considerable money was expended on improvements, elimination of rough crossings, new easy riding cars and other things. Then we used the newspapers to tell the people about it. We also advertised in our cars. The results have proved that we adopted the right method to sell our service to the public. Not one word of politics has been printed in our advertisements.

Popular Selling Appeal in San Francisco

Approximately 11,000 persons are now using the Sunday pass

Commission Receives Demands of Indianapolis Men

Union employees of the Indianapolis Street Railway, Indianapolis, Ind., carried their demands for increased pay and changed working conditions to the Indiana Public Service Commission on Oct. 24, through their attorney Frank P. Baker. The employees, members of the Amalgamated Association, ask for a basic wage of 56 cents an hour, instead of the present 40 cents an hour. Under the present agreement the carmen receive the base pay for the first year and and increase of 1 cent an hour each year for five years, when the maximum pay of 45 cents is attained. The demands are for 56 cents for the first six months, 58 cents an hour the next six months and 60 cents an hour for all periods over one year of service.

The demands were presented first to James P. Tretton, superintendent of the company, and then to Joseph A. McGowan, acting president, both of whom rejected them. Mr. McGowan informed the representatives that the company's earnings did not justify a salary increase at this time.

Taxi War in Muskegon

Muskegon has been added to Cleveland, Columbus, Louisville, Washington and other cities in which taxi companies have warred among themselves or cut prices and sometimes done both. Three weeks ago a local company appeared on the field to contest with the Yellow cab, formerly the only servce in the city. The new company announced a unit price of 25 cents anywhere in Muskegon, 50 cents to Mukegon Heights or North Muskegon, and 75 cents to Lake Michigan Park. The Yellow cab was forced to meet the competition, coming down to 20 cents for Muskegon and cutting to the competitor's scale to other points. On Oct. 25 the Checker Cab Company entered the fray at 20 cents for Muskegon and 5 cents lower to the other cities than the scale above. There is no charge for extra passengers, so workmen band together, call a cab and are driven to work for about 5 cents each. Mothers send children to school via cab, and one company is using the cabs for errand service.

Indiana Commission Starts Its Stand on Mergers

The Indiana Public Service Commission issued a statement recently seeking to justify its stand against the merger of certain utility properties during the last few months. The statement said:

The commission has no hesitancy in saying that if the public is to be protected against undue and unreasonable rates, greater scrutiny must be given in the future to purchase and sales and consolidations. The commission believes that the present tendency toward consolidation of purely local utilities into larger corporations in many instances is adverse to public interest. The commission believes that close local contact with the controlling authorities of utilities is more conducive to good service and reasonable rates.

The commission is of the opinion that utility rates generally are too high. It is determined to remedy this situation. The commission insists on its lawful right to approve or disapprove matters that come before it for sanction in the light of all evidence which it has, bearing on such matters.

Speculation in utility properties within this state has been very pronounced in the last few years. It is very clear to the commission that the tendency to inflate purchase and sales prices of utilities is a result of undue speculative activity. Purchase and sale price is used as a basis of security issues and becomes a factor in establishing fair value, which in turn determines rates. The commission cannot hope successfully to control rate making or the issue of securities if the present speculative activity among utilities is not more effectively controlled.

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Oftentimes unreasonable prices are paid for utilities. So long as valuations, security issues and rates keep pace with advancing purchase and sale prices, this practice will continue. A process of this kind is clearly adverse to public interest. The control of such matters is delegated by law to this commission. This commission feels it to be its duty to curb undue speculation in utilities within this state.

Committee on Unification in New York

The first concrete action on the transit unification plans proposed by Samuel Untermyer, special counsel for the New York Transit Commission, and Comptroller Charles W. Berry was taken on Oct. 23 by the Board of Estimate when Mayor Walker announced the appointment of a committee to study the projects and report to the board in four weeks. The committee consists of the Mayor, Joseph V. McKee, president of the Board of Aldermen, and Mr. Berry.

The Untermyer plan was submitted to the Board of Estimate last July. The Berry plan was made known in January.

Following are the main features of the Untermyer proposal:

Municipal ownership, with 5 cents as the "basic" fare.

Operation of the unified lines by a public corporation to be organized and owned by the city.

Existing lines to be acquired and new lines to be built with the bonds of this corporation, to be tax exempt and to be secured by a requirement that the fare must be raised if no other way of earning carrying charges can be found.

Existing lines to be acquired either by purchase or recapture, but probably by purchase of the B.-M.T. and recapture of the I. R. T.

No surface lines or buses included.

The directors of the corporation to be four city officials ex-officio and fifteen members appointed for ten-year terms, to escape political influence.

By use of corporation bonds instead of city bonds, the debt limit would be freed of the subway burden and the city left free to use its credit for building schools, etc.

The feature of the Berry plan which aroused greatest interest at the time of its proposal is the provision for a three-year trial of the 5-cent fare, with a referendum on the question after that period, if necessary. The plan would abolish the present Transit Commission and would set up a new transit authority similar to the Port of New York Authority to take over the unified system and lease it to an operator.

The plan provides that the transit authority shall consist of five or six commissioners to be appointed by the Mayor with the approval of the Board of Estimate. The new Authortiy would be expected to bring about the unification within a year. The plan provides also for limitation of the profits of the operating company and for ultimate ownership of the transit lines by the city when the securities listed in payment of the properties of the B.-M.T. and the Interborough, in case they shall have been purchased, have been retired.

Division of McGraw-Hill Executive Leadership

James H. McGraw continues as chairman of the board. Malcolm Muir elected president. Changes, in line with current expansion, take effect at once

RECENT growth and expansion of the McGraw-Hill Publishing Company have led to action by the board of directors, it was announced on Nov. 1, separating the offices of chairman of the board and president of the company, both of which have hitherto been held by James H. McGraw. Under the new plan of organization Mr. McGraw will continue as chairman of the board. Malcolm Muir, formerly vice-president, has been elected president of the company and chairman of its executive committee. James H. McGraw, Jr., vice-president and treasurer, has been elected vice-chairman of the board and chairman of the company's newly-created publishing committee.

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Malcolm Muir

Through merger and purchase in recent months the McGraw-Hill Publishing Company now comprises nine subsidiary and associated companies publishing business and industrial magazines, engineering books, catalogs and directories. Twenty-four magazines serving ten fundamental industries and covering business broadly are published at such widely distant points as New York City, Chicago, San Francisco and London. The direct effect of this coordination of related publishing interests will be to enhance publishing facilities for the group as a whole beyond those which any single paper or lesser group might enjoy. At the same time, the official announcement of the board of directors points out, these developments have greatly multiplied executive responsibilities and have necessitated a readjustment of the administrative duties of the company's principal officers.

Mr. Muir will be the chief executive of the McGraw-Hill Publishing Company, with full authority and responsibility for the operation of the company's business. He has been with the organization for the past 23 years and has been identified with many phases of its activities. During the past ten years particularly he has taken an active part in each step of the company's growth. He has been a leader in the work of the Associated Business Papers, serving as president in 1925-1926, and has been an important factor in raising the publishing standards of the business papers.

$1,200,000 Duboce Tunnel Opened in San Francisco

A celebration marked the official opening of the Duboce Tunnel on Oct. 22 and the inauguration through it of street car service over the new "N" line of the San Francisco Municipal Railway. Construction on the project had been under way since June, 1926.

To Mayor James Rolph fell the honor of piloting the first car. The motorman's cap he wore was more than a decoration. It was a badge of performance, for he actually piloted the car without assistance for 1½ hours—down Market Street from Duboce Avenue to the ferry, back through the tunnel and down to the ocean. His conductor, also garbed in regulation carman's attire, was Mrs. Minnie White.

The tunnel is approximately 4,200 ft. long, is double tracked and has a width of 25 ft. It was built at a cost of $1,200,000, while the car line cost an additional $600,000.

Eight Cents Authorized in Shreveport

In a decision handed down on Oct. 19 the Louisiana Public Service Commission denied the 10-cent fare rate requested by the Shreveport Railways, Shreveport, La., but authorized an 8-cent rate which is an increase of 1 cent over the present rate. The new ruling requires the company to sell books at the rate of eight for 60 cents, or 7½ cents each. Fares for children are retained at 3½ cents instead of the 4-cent rate requested.

The order terminates an issue which dates back to February, 1928, when the company applied to the commission for a 10-cent cash fare with a weekly permit card, three tickets for 25 cents and 4 cents for school children. After

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several months characterized by inaction, injunction hearing, adjournment and continuation the attorneys requested the United States Court to grant a further extension until Sept. 17 to give the commission sufficient time to consider the petition.

Capt. H. B. Hearn, president of the company, announced some time ago that the company's net earnings last year were $69,634 "on a property investment valued by eminent utilities engineers to be $2,804,884 at a minimum." After noting deductions of $51,037 for interest on borrowed money, the statement continues, the company had $18,597 left for improvements or to apply to dividends.

The various steps in this situation have been covered previously in these pages.

Jitneys Driven Off Detroit Streets

Jitney operation on streets in Detroit, conducted for the past six years under the protection of a series of injunctions, has been terminated by the police department acting under a decision of the Michigan Supreme Court. The jitney ordinance was signed by Mayor Couzens on May 29, 1922. It became effective the following October. On Oct. 24 the Michigan Supreme Court, in a majority opinion, upheld the validity of the ordinance and indicated that further legislation aimed to delay enforcement would not be tolerated. The ordinance in question prohibits the operation of jitneys on Fort Street East and West, Michigan Avenue, Grand River, Woodward Avenue, Jefferson Avenue, Cass Avenue, John R. Street and the parks and boulevards.

In order to provide transportation for passengers who formerly used the jitneys all available street cars and buses belonging to the municipal system have been thrown into service and buses and cars have been rented from the Eastern Michigan Railways, formerly the Detroit United Railway. Moreover, 30 street cars and trailers have been rented from the Cleveland Railway. They were run to Detroit over the connecting interurban lines.

The Supreme Court's opinion was handed down on the city's motion to dismiss the bill of complaint of the Red Star and the Blue Ribbon Jitney Drivers' associations. The court also took up the city's appeal asking for a writ of mandamus to compel Circuit Judge Clyde Webster to dismiss his injunction under the protection of which the jitneys were operating. The court opinion stated that with the dismissal of the bill, the injunction based upon the bill goes down with it. The order dismissing the writ was signed by Judge Webster when presented by the Corporation Counsel, leaving the city free to enforce the ordinance.

Edward N. Barnard, counsel for the jitney drivers throughout the long fight against the city, stated that the members of the jitney associations were willing to submit to any reasonable regulation, to operate under the direction and control of city authorities, to furnish any bond or surety and to comply with all requests of the city.

Del A. Smith, general manager of the municipal system, said there may be places in the city where supplemental service will be necessary. It is expected that within a week or so surveys will be completed indicating just where help is needed.

The first of the 50 new street car type buses which are being purchased from the American Car & Foundry Company, Detroit, will be delivered within a week and will be put into service immediately.

A de luxe bus service is being planned for Grand River and Woodward Avenues by the Street Railway Commission. It is expected that the first of a fleet of 30 16-passenger Graham-Paige buses, will soon appear on these lines. These buses were ordered by the commission after the jitneys were driven off the streets. No standing passengers will be permitted. The rate of fare to be charged on these buses has not been determined.

More Moves in Chicago Negotiations

City and company engineers disagree over financial set-up in proposed ordinance. Another suggestion made by Lisman group

REPRESENTATIVES of the Chicago Surface Lines and the Chicago Rapid Transit Company, meeting during the week ended Nov. 3 with the City Council's local transportation sub-committee, agreed to revise the financial estimates recently submitted by company engineers in the negotiations for a new unified transit ordinance. The estimates of the engineers were interpreted by the Aldermen as making necessary a fare of 11½ cents on surface and elevated lines by 1948 in order to yield the companies the return which they are asking.

As estimated by Major R. F. Kelker, Jr., the subcommittee's engineer, in the tentative draft submitted to the companies a few weeks ago, the fare in 1948 would be 7 cents on both surface and elevated lines, under the operation of the proposed ordinance.

New Financial Estimate Promised

When, after hearing the results of Major Kelker's conference with the traction engineers regarding a financial basis for the new ordinance, several Aldermen moved that the city break off all further negotiations with the companies and call in outside capital. Officials of the two systems contended that their engineers had no authority to decide the provisions desired by the companies and promised to furnish a new financial estimate.

The fares which the company engineers held to be essential to meet the desired return and the fares as incorporated in the committee's tentative ordinance, compare as follows:

RATES OF FARE

	Company Plan		City Plan	
	Surface Cents	Elevated Cents	Surface Cents	Elevated Cents
1929	7½	10	7	8½
1935	9½	10	7	8½
1937	10	10	7	8½
1944-48...	11½	11½	7	7

While it is now believed that the companies will accept virtually all of the financial arrangements upon which the committee's franchise plan is based, they will insist, however, in their demand that the return on the capital values of the present companies and on new capital, shall not fall below 6½ per cent, plus one mill for every revenue passenger carried. This stand, Major Kelker pointed out, accounts for the wide difference between the financial plan evolved by the committee and that of the companies. In the committee's set-up the return allowed to the company is 5½ per cent and only upon the initial capital value of the company. A camparison of the two estimates follows:

	Company Plan	City Plan
GROSS RECEIPTS		
20th year	$194,700,000	$119,100,000
40th year .....not estimated		155,850,000
COST PER PASS CARRIED		
20th year	9.15 Cents	5.45 Cents
40th year .....not estimated		5.45 Cents
RENEWALS		
Contemplated Expenditure (20 years)	$331,129,000	$129,742,000
Per Cent of present value of property ($258,000,000)	128 per cent	50 per cent
COMPANY'S RETURN		
Total	$566,299,000	$336,946,000
Average per year.	28,314,950	16,847,300
CITY'S RETURN		
Total	$48,266,000	$196,675,000
Average per year.	2,411,300	9,833,750
Portion of city's share used for reduction of fares	4,137,000	27,754,000
CAPITAL INVESTMENT		
Initial capital value	$258,000,000	$258,000,000
Extensions	235,000,000	235,000,000
Renewals	98,600,000	.....
Totals	$591,600,000	$493,000,000

John M. Harlan, attorney for the Lisman group of New York bankers which submitted a plan for a 20-year franchise nearly two years ago, suggested to the local transit sub-committee during the discussion of the respective financial plans that both his clients and the present traction systems be asked to submit in detail the best ordinance that they can on the same day, pointing out that if the Aldermen made it clear that no other plan would be considered after that date each bidder would make every effort to submit a better ordinance than the other. Both of these plans then could be passed on to the City Council and submitted to the voters.

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Bridge Line Bought by City

New York to substitute buses for present Manhattan Bridge service. Through service on Williamsburg span

ACQUISITION of the Manhattan Bridge Three-Cent Line by the city of New York was approved by the Board of Estimate on Oct. 25. The price to be paid is $206,760. This is $21,340 more than the franchise and the equipment of the company could have been bought for two months ago, when the outfit was offered to the city at $184,420.

While the board was thinking about the proposition, prompt acceptance of which was urged by Borough President Byrne of Brooklyn, the transit commission ordered improvements to be made on the 3-cent line. The cost of these improvements must now be borne by the city, but they will be removed along with the rest of the equipment to make room for additional vehicular traffic lanes on the bridge.

Representatives of the Brooklyn Chamber of Commerce and the East Side Chamber of Commerce in Manhattan, appeared to oppose discontinuance of the 3-cent line unless buses were to be substituted as soon as trolley operation ceased. The 3-cent line is operated between the Flatbush Avenue Extension in Brooklyn and lower Manhattan over the Manhattan Bridge. It has been indicated that the bridge runway now occupied exclusively by tracks of the railway will be converted to a roadway for motor vehicles thus increasing the vehicular capacity of the bridge, long since exceeded at certain hours of the day.

Mayor Walker promised that buses would succeed the cars, but no action in the matter was taken by the board. The bridge commissioner said he could put on emergency buses until a franchise can be granted for the permanent right-of-way to replace the railway.

Another development of considerable interest was the indication by Bridge Commissioner Goldman that he would soon be in a position to recommend to the Board of Estimate abolition of the local line on the Williamsburg Bridge and the restoration of through service by the Brooklyn-Manhattan Transit Corporation. This through service over the Williamsburg Bridge was discontinued on the day early in Mayor Hylan's administration when the city took over the local bridge line for municipal operation.

Mr. Goldman explained that the Brooklyn-Manhattan Transit Corporation wanted the city to advance $180,000 to meet the expense of a rearrangement of the tracks which would be necessary before through service could be restored, but that thus far he had not been able to agree with President Menden of the railway on that point. Mr. Goldman indicated that he expected some sort of compromise would be effected. For more than five years the East Side Chamber of Commerce has kept up its fight for the restoration of through service over the Williamsburg Bridge. Bankers, merchants and manufacturers were in the group that appeared before the Board of Estimate to urge the Mayor and his associates not to delay the installation of through service.

Mr. Young's Speech Distributed in Baltimore

Copies of the address made by Owen D. Young before the American Electric Railway Association in Cleveland on Sept. 25 have been printed in pamphlet form by the United Railways & Electric Company, Baltimore, and are being distributed by that company. The pamphlets are accompanied by a letter signed by C. D. Emmons, president of the company, who states that in Baltimore the street cars carry 75 per cent. of the people going to and from business. Mr. Emmons says:

Charging the company with the cost of repairing and repaving streets, relics of days when horse cars destroyed pavements, the 9 per cent tax designed to support the parks, once most frequently used by our car riders now used principally by motorists, who pay no park tax—these and other items now charged to the company are of the character of "special charges" which Mr. Young protests should be abolished. They simply increase carfare and prejudice the people against the company, which must collect it.

Mr. Young's general conclusion was that without a proper carfare, cities will have to raise money for transportation indirectly but more expensively—namely, through taxation under public ownership.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Nov. 8-9—**Iowa Electric Railway Association, operating meeting, Roosevelt Hotel, Cedar Rapids, Iowa.**

Nov. 13-16—**National Association of Railroad and Utilities Commissioners, New Orleans, La.**

Nov. 14—**Association of Electric Railway Equipment Men, Middle Atlantic States, semi-annual meeting, Hampton, Va.**

Nov. 21-22—**Public Utilities Association of Virginia, Hotel Roanoke, Roanoke, Va.**

Nov. 21-22—**Central Electric Traffic Association meeting, Auditorium Hotel, Cleveland, Ohio.**

Dec. 10—**National Highway Traffic Association, annual meeting, Automobile Club of America, New York, N. Y.**

Jan. 14-18, 1929—**American Road Builders' Association, convention and road show, Cleveland, Ohio.**

Jan. 23-25, 1929—**Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.**

Bridge Controversy in Omaha

The Omaha & Council Bluffs Street Railway appears to be menaced by the action of the courts in Council Bluffs requiring the county board to submit a $400,000 bond proposition to join with Omaha in building a no-toll bridge across the Missouri River connecting both cities. Previously the board had refused. The county board in Omaha had already voted to submit an $800,000 bond issue as its contribution to the cost of the bridge.

In a full-page advertisement in the Omaha newspapers President Shannahan of the Omaha & Council Bluffs Street Railway has offered to sell the company's bridge to the public. He explains what will happen to street car service if the people of the two communities vote bonds to build a free toll bridge. He points out that the Council Bluffs line is merely under lease to the Omaha company. For thirteen years the bridge company was supported by revenues from the Omaha company, and during the last year the deficit in operation of the Council Bluffs company, counting taxes and bond interest, was $111,623. A similar situation now exists with reference to the Omaha company. The net revenues from the bridge alone the first nine months of this year were $231,539, while the deficit from the operation of the lines in Omaha was $100,650, that much less than enough to pay bond interest, without any dividends. The Omaha company pays $60,000 a year rental, and there is a $2,000,000 mortgage on the Bluffs property and bridge.

Mr. Shannahan says that the company recognizes the existence of a strong sentiment in favor of a free bridge, and that it will sell the bridge at its just and fair value. It suggests that the proposition can be handled in one of two ways, mortgaging the bridge tolls and allowing these tolls to pay for the structure until it is made a free bridge. The other would be to have the cities or counties issue bonds. This is objectionable because this would increase taxes on the railway.

He also makes it plain that the Omaha company is merely a tenant and that any sale made must be by the Council Bluffs company, which cannot pass a clear title without the consent of the Omaha corporation. He thinks that if the bridge is bought on a fair price basis bankruptcy can be avoided, but that this contingency is inescapable if a competing non-toll bridge is built. The money from the sale will be divided and used to reduce the interest charges of each company.

Objects to New Service in Ohio

The Lake Shore Electric Railway, Sandusky, Ohio, has protested to the Ohio State Utilities Commission against application of the Moor Trucking Company for permission to operate trucks across Ohio from Detroit to Pittsburg. The railway says it is giving adequate service and that a motor line is unnecessary.

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Recent Bus Developments

Ohio Bus Company Restrained by Court

Inter-terminal bus service between Alliance and Sebring, Ohio, a distance of 4 miles, served by the Sebring-Alliance Bus Company, has been terminated since the United States Supreme Court at Washington, D. C., has dismissed a plea from the bus company in its fight for an unrestricted certificate of operation. In this ruling the court sustained the Ohio Supreme Court. The Ohio court has issued its order to the Ohio Public Utilities Commission to revoke the old bus certificate and order operation under the new restricted permit.

Action of the courts and the utilities board is the result of charges made by the Stark Electric Railroad, Alliance, which operates between Alliance and Sebring. The electric railway contended the bus line was operating under an illegal certificate. Investigation resulted in the old certificate being revoked, but immediately the Ohio Public Utilities Commission issued a new certificate without restrictions. The case was carried by the Stark Electric to the Ohio Supreme Court, which ordered the Ohio utilities commission to grant a new certificate which would prohibit inter-terminal service.

The new permit allows the bus company to take on passengers at either the Alliance or Sebring terminals, but they must be discharged before the bus crosses the corporation limits of the other city. Passengers who board buses between the two places can ride to either terminal.

This restriction was opposed by the owners of the bus line. The plea for an unrestricted certificate was carried to the United States Supreme Court, but that request has been dismissed and the state court ordered to enforce its ruling.

Fifteen-Year Franchise for Tulsa Operation

The City Commission of Tulsa, Okla., has adopted an ordinance making effective a fifteen-year franchise voted by the citizens Oct. 17, to the Union Transportation Company and the Berry Bus Line Company. The Union Transportation Company is under the same ownership and management as the Oklahoma Union Railway and these companies and the Tulsa Street Railway furnish street car and bus service in Tulsa. The Berry Bus Line Company supplies bus transportation to sections of the city that are tenanted largely by colored people.

The Union Transportation Company has a total investment of $500,000 in bus equipment. The company operates 80 buses wholly for city service, of which 55 are continually in use. An average of 22,000 persons ride the buses every day.

Buses Will Not Solve Seattle Problem, Says Mr. Avery

Arrangement by the City Council of Seattle, Wash., of another loan of approximately $700,000 from the city light or city water department for the Seattle Municipal Street Railway system has been suggested by Councilman E. L. Blaine, chairman of the finance committee, as virtually the only means of enabling the railway department to meet bond interest and redemption payments due next March. Even this, it is declared, will afford only a temporary solution of the railway system's financial problem, leaving the city confronted by the necessity of working out, within the next few months, a complete refinancing and rehabilitation program for the entire car system.

George B. Avery, superintendent of public utilities, at the invitation of the Council, is now working upon detailed suggestions and proposals for the major program, which members of the Council estimate may entail the expenditure of approximately $5,000,000, and which may involve an extensive reorganization within the railway department as well as in operation of the service.

Mr. Avery said that buses would not and could not solve Seattle's transportation problem. Bus operation in Seattle had proved a poor but very expensive substitute for extended street car lines. The buses already operating in Laurelhurst were paying half the cost of their operation. Not one of the city's bus routes is paying. He saw the problem solved by various extensions to the railway lines, replacement of old rolling stock with new equipment, and general improvement of tracks.

Councilman Blaine said that of a loan of $650,000 made to the street railway department by the city light department about a year ago, all but about $100,000 will have been repaid before March 1, at which time the railway system must be prepared to pay $1,125,025 on bonds and interest. It is figured that current revenues of the system, averaging about $475,000 a month, together with a small reserve now on hand, will take care of operating expenses and provide the amount of money needed in addition to the $700,000 loan which is being contemplated.

Meantime, the City Council utilities committee has denied the petition of Beacon Hill residents for an extension of car service into their district. The Council will hold another hearing in about three weeks on the proposal, but before the time for that meeting it hopes to figure out a way to improve the service.

Indiana Cities May Regulate Buses

Right of the city of Muncie, Ind., to control bus operation within its corporate limits has been upheld by the Indiana Supreme Court in a recent decision. The case was sponsored by Sumner B. Denny and a group of independent bus operators, with Arthur W. Brady, president and receiver for the Union Traction Company of Indiana, as defendant. The decision ends a protracted controversy between the railway and the independent bus operators and city officials of Muncie. The railway operates a bus line in the city under a certificate of convenience and necessity issued by the Indiana Public Service Commission.

The railway contended that it had the sole right to operate buses in Muncie, but the independent operators asserted that Muncie came within the purview of section 5 of the 1925 bus regulation law, which provides that cities already having bus service at the time the law went into effect retained control of the buses. Muncie regulatory laws were passed by the City Council there in 1926.

The Union Traction Company obtained an injunction at Muncie to prevent the independents from operating. The Supreme Court decision reversed the lower court's rulings in the matter, which had been decidedly in favor of the railway.

Buys Stock of Pacific Coast Motor Coach

The Pacific Electric Railway, Los Angeles, Cal., has been authorized by the Railroad Commission to purchase all of the outstanding stock of the Pacific Coast Motor Coach Company, amounting to $45,000, and to take over the operation of that company.

Express Car and Local Bus Working Out in Louisville

G. B. Powell, head of the bus department of the Louisville Railway, Louisville, Ky., in commenting on the combination bus and railway service on the Broadway line, by which the street cars became express cars, with local stops made by the buses, stated that the plan had worked out smoothly and was proving successful.

Prior to the recent installation of the bus service 28 motors and 14 trailers were used in handling the peak loads. Today the peak load is handled with 24 motors and 12 trailers, and normal day loads with 14 cars and no trailers. Fourteen buses carrying 29 passengers each are used on the line in making the local stops. The street cars seat 42 passengers.

Fare on buses or street cars is 7 cents, with single or double transfers made, as usual, plus the transfers to and from the buses, and the street cars of the same line.

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Financial *and* Corporate

Broad Street Operation Results in Loss of $304,431

Analysis of the revenue statistics by the city, Philadelphia Rapid Transit Company, and commission experts comprising the Broad Street Subway Conference Board disclosed that the net income of the P. R. T. system had decreased $304,431 during September because of the subway operation. Of that total $200,000 represents the sum paid monthly by the P. R. T. to the city for operating privileges. Added passenger revenue brought into the P. R. T. system through the tube operation amounted to $24,000 plus $1,000 revenue from other sources. Also about $7,500 was saved in operating expenses on the surface system because of riding traffic diverted to the subway. Against the total gross revenue of $136,556 for the line during September, paid by 2,519,356 riders, there stands the $400,000 which the city and P. R. T. meet on an equal basis for fixed charges on the city bonds sold for construction of the line.

The report given out on Oct. 29 states in part:

It is obvious that the brief term of a 90-day lease makes impractical the expenditure necessary and the disturbance to the car-riding public attendant on such a general rerouting as would develop the maximum possible use of the subway, since such rerouting might be entirely reversed if the lease were not extended.

Broad Street subway carried during September 2,519,359 passengers. It operated 361,510 car miles and 27,569 car-hours. The normal week-day service provides a headway of five minutes during the middle of the day and four minutes during the peak hours, morning and evening. During the middle of the day three-car trains are operated, and during peak hours six-car trains are operated. During the present operation when City Hall station is used to somewhat greater proportional extent than will be the case when the subway is extended to South Street, one track has been planked over to supply additional platform space, and operation into and out of the station must be by single track.

Since this condition exists it may not be possible materially to reduce the intervals between trains below that stated. Present timetables call for the operation of 78 of the 150 cars supplied by the city. The reserve is obviously adequate for some time to come. Of the northbound passengers 769,727, or 61.2 per cent of passengers originated at the City Hall station, and 411,414 passengers, or 32.6 per cent, of the southbound passengers originated at the Olney Avenue station, indicating the large preponderance of long riders and through traffic.

The Engineering Committee of the Board was assigned the task of determining the passenger revenues which were brought into the P. R. T. system by reason of the operation of the Broad Street subway. Excerpts from this committee's report have been accepted by the board as expressing with substantial accuracy the passenger revenues which have been brought into the P. R. T. system by reason of the operation of the Broad Street subway.

Mayor Mackey said that the program he has in mind is to continue for two years the experimental operation of the Broad Street subway under lease to the Philadelphia Rapid Transit Company. The present lease dates from Sept. 1, is for three months, at a rental to be paid the city by the P. R. T. of $200,000 per month, plus the operating cost. Provision is made in this temporary lease for its extension beyond Nov. 30 from month to month. Some time in December, it is expected, a new lease for two years will be drafted, based upon the revenue received by the system during the three-months' experimental operation.

Before the expiration of the two-year agreement the South Broad Street section of the subway will have been in operation for almost a year, so that such data as to fares, operating cost and other expenditures will have been more definitely determined for the completed system in Broad Street. The Mayor has fixed Jan. 1, 1930, as the date for opening and operation of the tube south of City Hall to South Street.

Roger Babson Buys Into Boston & Worcester

Roger W. Babson and associates are understood to have acquired control of the Boston, Worcester & New York Street Railway, the successor following foreclosure to the Boston & Worcester Street Railway. At the first meeting of the new board, which was held recently, it was voted to pay the 2½ per cent interest coupon on the 5 per cent reorganization mortgage bonds, which was deferred last May. The company is doing a little better than breaking even and is understood to be earning the interest charges on the funded debt. The outlook for the company's coach line is regarded as favorable.

Loss on San Francisco Municipal $290,326

Total passengers carried 85,281,171. Profit of $44,558 shown before allowing charter comparison charges that put system on a basis similar to private enterprise

FOR the fiscal year ended June 30, 1928, the Municipal Railway of San Francisco, San Francisco, Cal., reports a loss of $290,326 compared with a loss for the year ended June 30, 1927, of $240,228. As in a comparison of 1927 with 1926, most items of expense in 1928 increased over those of the previous year, the total being $3,012,641 against $2,897,905 for 1927. These facts were disclosed in the financial report prepared for and approved by the finance committee of the Board of Supervisors.

STATEMENT OF BUS LINE OPERATIONS OF THE MUNICIPAL RAILWAY OF SAN FRANCISCO

	1928 Total
Revenues:	
Passenger revenue	$109,938
Miscellaneous revenue	29,424
Total revenues	$139,363
Expenses of operation:	
Repairs and painting	$24,857
Tires, including repairs	16,876
Gasoline and oils	21,012
Cleaning, washing and servicing	17,572
Conductors' and chauffeurs' salaries and wages	67,762
Depreciation of buses	27,502
Proportion of general expenses—	
Insurance	17,907
Administrative salaries	8,400
Pension fund payments	4,200
Equipment rental	3,294
Garage rental	3,000
Store room expense	4,787
Stationery and printing	300
Total expenses	$217,472
Loss from operations	$78,109
Add:	
Interest on investment	5,794
Loss on buses retired	12,491
Net loss for period	$96,395

An analysis of the item of $8,894,122 in road and equipment shows a net increase over the previous year of $257,282. Provision for depreciation in the amount of $259,105 has been made during the period under review applicable to those assets acquired prior to July 1, 1927. This provision was calculated at the rate of 3 per cent per annum. At stated intervals during the year there were transferred from the Municipal Railway (operating) fund to the depreciation reserve fund amounts aggregating the sum of $250,921 on account of depreciation provision. Construction work in progress totalled $174,654.

Under the heading "Due from General Fund of City and County of San Francisco" is the sum of $82,123, including $32,152 from the account of the Twin Peaks Tunnel and $48,971 on account of Stockton Street Tunnel. Under miscellaneous accounts payable, amounting to $28,902 are amounts of various invoices received from the Market Street Railway representing charges for a portion of the cost of work done on crossings over the Municipal Railway tracks. These charges have accrued over a period of years during which they have been the subject matter of litigation. It appears that legal opinions indicate these to be proper charges.

The reserve for accidents was $80,296 for the year ended June 30, 1928. This reserve fund was established by ordinance No. 7060 N.S. passed by the Board of Supervisors in April, 1926. According to the terms of the ordinance 2½ per cent of the gross traffic revenue

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INCOME ACCOUNTS MUNICIPAL RAILWAY OF SAN FRANCISCO

	Year Ended June 30 1927	1928	Dec. 28, 1912 to June 30, 1928
Passenger revenue	$3,398,187	$3,461,859	$38,939,568
Miscellaneous revenue	14,145	15,806	167,438
Total revenue	$3,412,332	$3,477,665	$39,107,006
Operating expenses:			
Way and structures	$144,876	$155,267	$1,350,048
Equipment	212,597	238,867	2,344,936
Power	488,143	496,421	5,308,072
Conducting transportation	1,843,837	1,911,764	18,050,926
Traffic	423	291	4,551
General and miscellaneous	190,027	210,029	1,743,872
Total operating expenses	$2,879,905	$3,012,641	$28,802,408
Profit from Operations	$532,426	$465,024	$10,304,598
Deduct provision for—			
Depreciation	247,362	259,105	4,176,401
Accidents	84,954	86,546	757,531
Total deductions	$332,316	$345,651	$4,933,932
Income from operations	200,109	119,372	5,370,665
Non-operating income:			
Income from securities owned	46,641	34,882	486,261
Subsidy from harbor commission	4,470	8,374	12,845
Other income	21,734	45,191	206,266
Total non-operating income	$72,846	$88,448	$705,372
Gross income	272,956	207,820	6,076,038
Deductions from gross income—			
Interest on funded debt	$167,768	$158,358	$3,064,900
Miscellaneous debits	22,006	4,904	64,580
Total deductions from gross income	$189,775	$163,262	$3,129,481
Net income before comparative charges	83,180	44,558	2,946,556
Deduct comparative charges—			
Taxes	$318,271	$328,116	$3,476,788
Fire insurance	5,138	6,768	73,827
Total comparative charges	$323,409	$334,884	$3,550,616
Profit and loss balance	*$240,228*	*$290,326*	*$604,059*

Italics indicate loss or deficiency.

CONDENSED COMPARATIVE BALANCE SHEET AS OF JUNE 30

Assets	1928	1927
Capital assets	$9,393,650	$8,969,134
Current assets	1,482,250	2,026,605
Total assets	$10,959,495	$11,080,168
Liabilities, reserves and surplus:		
Funded debt unmatured	$3,099,000	$3,295,000
Current liabilities	400,980	574,951
Reserve (total unadjusted credits)	$4,141,226	$3,951,665
Contributed surplus	371,733	356,552
Net surplus	3,318,289	3,258,550
Total liabilities	$10,959,495	$11,080,168

CASH AND SECURITIES WITH TREASURER

Funds	Total	Cash	Securities
Accident reserve	$90,322	*$2,011	$92,334
Depreciation reserve	423,343	13,706	409,637
Depreciation	337,786	59,034	278,752
Totals	$851,453	$70,729	$780,723

* Loss.

ANALYSIS OF ANNUAL PROVISION FOR DEPRECIATION AND PERCENTAGES BASED ON COST, MUNICIPAL RAILWAY OF SAN FRANCISCO

Fiscal Year Ended June 30	Provision Gross	For Redemption of Bonded Debt	For Depreciation	Cost of Road and Equipment Amount	Percentage
1913	$24,291	.....	$24,291	$1,660,492	1.463
1914	149,672	.....	149,672	4,307,115	3.475
1915	294,959	$101,000	193,959	5,042,331	3.847
1916	352,075	101,000	251,075	5,396,706	4.652
1917	264,727	101,000	163,727	5,838,791	2.804
1918	425,271	200,000	225,271	6,174,607	3.648
1919	430,543	196,000	234,543	6,578,885	3.565
1920	486,551	196,000	290,551	6,658,817	4.363
1921	516,414	197,000	319,414	6,674,682	4.785
1922	519,266	197,000	322,266	6,802,637	4.737
1923	538,889	200,000	338,889	7,267,837	4.663
1924	571,172	201,000	370,172	7,570,225	4.890
1925	588,308	201,000	387,308	7,992,410	4.846
1926	549,955	151,166	398,789	8,245,407	4.836
1927	247,362	.....	247,362	8,245,407	3.000
1928	259,105	.....	259,105	8,636,839	3.000
	$6,218,568	$2,042,166	$4,176,401		

The difference between the balance in this account and the net provision, as disclosed by the above table, is accounted for as follows:

Net provision as disclosed by table	$4,176,401
Less provision applicable to assets retired:	
Fiscal year ended June 30—	
1921	$2,063
1923	30,650
1924	1,082
1925	4,960
1927	43,649
1928	33,066
Total	$115,472
Balance per books, June 30, 1928	$4,060,929

STATISTICAL DATA MUNICIPAL RAILWAY OF SAN FRANCISCO FOR THE FISCAL YEAR ENDED JUNE 30, 1928

	Total	Per Car-Mile	Per Car-Hour
Passenger revenue	$3,461,859.03	0.3584	3.4645
Operating expenses	3,012,641.28	.3120	3.0149
Interest on funded debt	158,358.34	.0164	.1585
Provision for depreciation	259,105.20	.0269	.2593
Provision for accidents	86,546.56	.0090	.0867
Taxes (comparative charge)	328,116.18	.0340	.3284
Fire insurance (comparative charge)	6,768.67	.0007	.0068
Net loss	*290,326.40*	*.0301*	*.5905*
*Passenger car mileage	9,657,311		
†Passenger car-hours	999,243		
Platform expense	1,588,873.45	.1645	1.5901
Number of passenger cars owned	234		
Number of work cars owned	6		
Total number of cars owned	240		
Total number of buses owned	18		
Total number of cars and buses owned	258		
‡Revenue passengers carried	70,142,704	7.2632	70.1959
Free transfer passengers carried	14,575,953	1.5093	14.5870
Free passengers (employees and police)	562,514	.0582	.5629
Total passengers carried	85,281,171	8.8307	85.3458

* Includes bus mileage of buses.
† Includes bus-hours of buses.
‡ Transfers lifted at Fillmore and Union Streets treated as revenue passengers pending the result of present litigation with Market Street Railway.
Total single track mileage June 30, 1928 ..... 74.12

must be set aside in the above fund for the purpose of paying claims for accidents and damages resulting from the operation of the Municipal Railway (other than accidents to employees) and expenses incidental thereto.

Ordinance No. 7060 N. S. provides that 3 per cent of the cost of road and equipment shall be set aside each year to meet all charges arising on account of depreciation of road and equipment.

Since the Municipal Railway is owned by the city and county of San Francisco and has no capital stock, the excess of assets over liabilities represents surplus. In the preparation of this report the surplus account has been subdivided into three groups: (1) that which has been contributed; (2) that which has been deducted from operating revenues for comparative charges for which no liability exists; (3) that arising from operation of the railway. A comparative statement of earnings and other data are shown in the accompanying tables.

Suspension in Ohio Will Affect Many Towns

Residents of more than a score of towns along the line of the Southern Ohio Public Service Company, from Columbus to Zanesville, will be without railway service if that company secures the consent of the Ohio Utilities Commission to abandon its line. Suspension will also mean that the Columbus East Mound Street line, operated by the Columbus Railway, Power & Light Company, will be abandoned. This line has been operated by the latter company through an agreement with the Southern Ohio Public Service Company to furnish the local service required.

The Southern Ohio Public Service Company has been in the hands of a receiver for the past five years. The growing number of autos and buses has greatly reduced its patronage, according to officials, who also point out that the company faces a demand for improvements that would cost nearly $650,000 in Columbus, along the National Highway, and in Newark, Zanesville and at other points.

Further Simplification of Georgia Power Company Structure

Stockholders of the Georgia Power Company have approved an agreement for consolidation of the Central Georgia Power Company, the Central Georgia Transmission Company, the Macon Railway & Light Company and the Georgia Public Service Corporation with the Georgia Power Company. The consolidation agreement, which previously had been unanimously approved by the boards of directors of the companies, will be submitted to the stockholders of the Macon company at a meeting in Macon shortly. The consolidation, if approved, is expected to become effective in about 30 days after it has received the necessary indorsement of the secretary of state.

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Net Below Allowed Return in St. Louis

The St. Louis Public Service Company, St. Louis, Mo., had a return of only $757,662 on its investment during the quarterly period ended Sept. 30 according to advertisements inserted by the company in the St. Louis newspapers on Oct. 24. The return is $405,999 less than the amount authorized by the Missouri Public Service Commission on the valuation fixed by the state board. It is approximately 4.5 per cent annually, although the commission found that the company was entitled to 7.14 per cent. Under the commission's return basis the net should have been $1,163,661 on its valuation of $63,500,000 during the quarter.

The advertisements are headed "The Facts About Street Fares and Where They Go" and are in keeping with the company's policy of dealing openly with the people on all questions affecting fares and service. Similar statements are to be published at regular intervals so as to keep the public informed on company revenues and expenditures.

Concerning the fares the company's advertisements state:

Various items have appeared recently in the public press referring to the rates of fare. Representatives of the company have not recently proposed any change in fare. They have stated that a 10-cent cash fare, four tokens for 30 cents, for adults, would probably yield approximately the same amount as the present fare.

The company is not now in a position to state whether there will be any change in car fares, because the required revenue cannot be estimated until the Public Service Commission of Missouri has determined the amount of operating revenue required for wages as a result of the hearings just concluded before it.

The company bases its claim to a quarterly return of $1,163,661 on the valuation as of Jan. 1, 1927, fixed by the state commission plus $1,669,974 for addition and betterments since that date.

Abandonment of Rochester & Sodus Bay Line Approved

The Public Service Commission approved on Oct. 24 a declaration of abandonment by the New York State Railways of the Rochester & Sodus Bay line in the towns of Irondequoit, Penfield, Webster, Williamson, Ontario and Sodus, a distance of about 34 miles. It was found that further operation was not necessary or convenient for the public.

According to the evidence submitted to the commission the number of passengers on the Rochester & Sodus Bay line decreased from 1,708,008 in 1912 to 363,017 in 1927 and 142,179 for the first six months in 1928. Evidence also showed that in 1922 the revenue from passengers was $160,973, while in 1927 it was $92,735. The operating loss for 1927 was $47,486. The company further claimed that if the line were to continue, renewals and replacement to its roadbed and overhead system would require an expenditure of approximately $166,410. Evidence was submitted to show that the earnings of the New York State Railways system were not sufficient to absorb the loss on the Rochester and Sodus Bay line.

Twin City Issue Approved

The Minneapolis & St. Paul Suburban Railway has been authorized to issue $500,000 in stock, all to be taken by the Twin City Rapid Transit Company, in payment of the act of the Twin City in assuming $500,000 in bonds issued by the suburban company in 1899. After a brief hearing the Minnesota Commission approved the plan on Oct. 25.

Denver Net Increased

The directors of the Denver Tramway, Denver, Colo., met on Oct. 25, but nothing was done about a change in the fare. The present rate is 8 cents or two tickets for 15 cents if tokens are purchased. The statement of earnings from January to September shows net of $377,511 after deduction of interest. The total operating revenue for the period decreased $67,843 below the similar 1927 period, but net operating income showed an increase of $22,521 accounted for by economies. Total operating revenue was $3,204,651. Return on the investment of the company fixed by the courts is about 4 per cent against a 7½ per cent return deemed to be necessary under court rulings.

Legal Notes

FEDERAL DISTRICT COURT—*Powers of State Commission Over Fares.*

The Pennsylvania Public Service Act, which empowers a state commission to prescribe fares of street railway companies, does not impair the obligation of contracts even when the original contract with the railway contains a clause limited its fares to a certain amount. [Sambor et al vs. P. R. T. Co., 27F (2d) 406. Also City of Philadelphia ex rel Furey vs. P. R. T. Co. et al. 27F (2d) 439.]

ILLINOIS — *Financial Responsibility for Shift of Track on Viaduct.*

A steam railroad was responsible for keeping in repair a viaduct which was built over its tracks. During extensive repairs to this viaduct, some street railway tracks which were on it had to be transferred from one side of the viaduct to the other and then back again. The expense of this transfer was held to be a part of the general repair of the bridge for which the steam railroad was responsible. [Chicago City Railway vs. Chicago and W.I.R. Co., 162 N.E., 852.]

MASSACHUSETTS—*Railway Not at Fault When Passengers Crowd to Leave or Enter Its Cars.*

A passenger after having left an elevated train was injured on the platform by being jostled by other passengers. The railway was held not at fault in failing to prevent passengers from crowding when they leave or enter its cars in the customary way. Where there is evidence of boisterous or disorderly conduct which should have been foreseen, a jury may find the carrier to have been negligent in failing to prevent it. Testimony that other passengers had been injured at other stations in a similar manner was immaterial, as the only question in the case in point was whether the company had shown negligence to this particular defendant. [Boyd vs. Boston E.R. Co., 162 N.E., 735.]

MISSOURI—*Duties of Guest in Automobile at Railroad Crossing.*

A passenger guest in an automobile about to cross a railroad track is not required to use the same vigilance as is required of the driver, but he is required to use that degree of care that an ordinarily prudent person would use under similar circumstances. In this case the court held that the track, the warning sign, the whistle and the noise of the approaching train were indications that a train would soon be at the crossing, and a word of warning to the driver might have avoided the casualty. Hence, the guest was negligent in not giving this warning. [Cox et al. vs. St. L. and San F. Ry. 9 S.W. (2nd) 96.]

NEW YORK—*Liability of Subway Contractors for Damages to Surface Property.*

A street railway operating over streets under which a subway was being built brought suit against the city for damages caused by interference with its track structure and the operation of its cars. A motion by the defendant to include various subway contractors, because of their responsibility for the conditions complained about was granted on the ground that their contracts with the city covered conditions of this kind. [Eighth & Ninth Avenues R. Co. et al. vs. City of New York et al., 228 N. Y. S., 201.]

OHIO—*Charge on Contributory Negligence Must Be Complete.*

A charge of the court on contributory negligence must be complete, showing both what the duty of the plaintiff is respecting the burden of proof, and what the duty of the defendant is in respect to its burden as to contributory negligence. If the error in such a charge is one of commission, a general exception to it is adequate. If it is one of omission the objecting attorney should suggest what further statement he wants the instructions to include. [Cleveland Ry. vs. McCoy, 162 N.E., 699.]

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Personal Items

JOHN A. REICH, formerly chief engineer of the Ponce Electric Company, Ponce, Porto Rico, has been transferred to the Virginia Electric & Power Company. Eldon Tyler has been selected to succeed Mr. Reich. Both these companies are controlled by Stone & Webster, Inc.

GEORGE E. HAGGAS, for the past ten years chief engineer of the Cumberland County Power & Light Company, Portland, Me., has been appointed assistant general manager of that property. Mr. Haggas was engaged in valuation engineering in Michigan prior to joining the Portland company, and for three years before being made chief engineer was occupied in that branch of technical activity on the Cumberland County system.

OWEN KRAFT has resigned as assistant to the president of the Philadelphia Company, Pittsburgh, Pa., to become associated with the recently opened Pittsburgh office of H. M. Byllesby & Company, investment securities. He commenced his activities in his new field on Oct. 1.

ALBERT M. BOYD has been appointed manager of personnel, claims and safety departments of the Philadelphia Electric Company and the Philadelphia Suburban Counties Gas & Electric Company. Mr. Boyd has been in the employ of the United Gas Improvement Company since June, 1901.

J. L. CAMPBELL is appointed acting chief engineer of the Northwestern Pacific Railroad, San Francisco, Cal. This appointment is effective Oct. 26.

OBITUARY

David W. Henderson

Superintendent of Seattle Municipal dead. Kept road on an even operating keel through storms of public criticism

DAVID W. HENDERSON, superintendent of the Seattle Municipal Railway from the time of its purchase in April, 1919, by the city of Seattle, Wash., from the Stone & Webster interests, died in Seattle on Oct. 27. He had suffered from pernicious anaemia for many months. Not many weeks ago resort was made to transfusions, scores of volunteers from the railway department offering their blood for their stricken chief. He had revived beyond all expectations, and for some time had been thought on the road to recovery. He had been on leave of absence from his duties with the railway since early in June of the present year.

BORN IN SCOTLAND

Mr. Henderson was born in Scotland on Feb. 24, 1873. His parents migrated to Randolph, Wis., when he was eight years of age. Educated in the public schools of that state, he began teaching in the country schools at the age of 18 and followed this occupation in Wisconsin until 1902, when he moved to Seattle.

On April 8, 1902, he entered the service of the city railway lines of the Seattle Electric Company as a motorman and continued in that capacity until early in 1905, when he was promoted to the position of inspector. Other advancements followed until at the time the system was taken over by the city Mr. Henderson was holding the position of superintendent of transportation, under G. A. Richardson, general superintendent of the property who is now general manager of the Chicago Surface Lines.

D. W. Henderson

Mr. Henderson was appointed to the position of superintendent of the municipal lines by Ole Hanson, Mayor of Seattle, who had negotiated the purchase of the street railway lines from Stone & Webster, and he continued in this position under subsequent administrations. Distinguished by his rugged honesty, his poise under trying situations and his keen sense of proportion, Mr. Henderson was credited with having kept Seattle's municipal railway on an even operating keel through the storms of public criticism that have assailed it from time to time since its accession from its former owners.

Mr. Henderson is survived by a wife and three sons, the oldest of whom, David Jr., has just completed high school.

James A. Smith

James A. Smith, superintendent of the Schenectady plant of the General Electric Company for the last fifteen years, died on Oct. 25 at his home in Schenectady. Mr. Smith was endowed with mechanical genius of the highest order and his knowledge of machine tool design and application was unsurpassed. His skill and experience made him a most useful and valuable counselor for any who sought his advice. He possessed unusual executive ability and his acquaintanceship with the employees was of such a kindly and intimate character that he was genuinely loved and admired by them.

His first General Electric position was at the Schenectady plant as assistant to the mechanical superintendent. In a few months' time he was made superintendent of one of the shops. He became general superintendent of the plant in July, 1913.

From 1901 to 1903 Mr. Smith was associated with the Niles-Bement Pond Company, and in 1905 was made superintendent of the Dutchess Tool Works at Fishkill Landing, N. Y., which position he held until he entered the employ of the General Electric Company in 1910.

Mr. Smith was born in Hartford, Conn., on May 25, 1873, and in his youth worked on a farm. In 1888 he entered the employ of Pratt & Whitney in Hartford, Conn., about a year later entering the apprentice shop of that company. He was sent to Chicago to install the Pratt & Whitney exhibit at the World's Fair and, in 1900, was selected to install and demonstrate the company's exhibit at the Paris exposition.

Owen D. Young, chairman of the board of the company, said:

> The death of James A. Smith brings to me and to every one who was associated with him a feeling of great personal loss which is accentuated by the suddenness of the blow. We feel first that we have lost a friend and next that we have lost a competent and highly efficient associate. He was so very human that even his discipline was a delight and, from an organization standpoint, his frankness and directness disciplined those above as well as below, but always with kindliness and charm and, basicly underneath it all, good humor and friendship. How much we shall miss him I need not say, because every person who has come in contact with him knows. I share with his family and with his friends their sorrow at his death.

O. C. Chesney, vice-president and chairman of the manufacturing committee of the General Electric Company, said:

> Mr. Smith was a mechanic by nature and training—a mechanic of the very highest type. His knowledge of machine tools and of their capabilities was unsurpassed by that of any other employee, and it made him for many years a most useful counselor of the manufacturing committee on all questions relating to equipment. He also possessed executive ability of a high order; his activities as an executive being of the direct, human kind.
>
> His premature death is a great loss to the company and a keen personal loss to thousands of individuals.

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Volume of Material Purchases Constant

Line market active. Hamilton, Ont., orders twelve cars. One car contemplated by Beech Grove Traction

THE apparent decline in the purchase of track materials continues this week. However, according to reports received from a number of electric railways, there has been an offsetting increase in the purchases of line material and equipment. Louisville Railway, Louisville, Ky., has placed orders for 15 miles of 00 round hard-drawn copper trolley wire, 1 mile of 12-gage insulated iron telephone wire, 215 30-ft. class B Western red cedar ½-in. penetration poles, and 75 30-ft. class B creosoted pine poles. Other line equipment ordered by this company includes two electric switch ground boxes, one right-turn signal for use with electric switch and electric circuit changer, 2,500 ½x4½-in. galvanized lag screws, 500 porcelain strain insulators, 500 galvanized guy clamps, 50 bronze frogs, 500 clinch ears, 300 splicing ears, 500 flexible approaches, 50 center castings and 100 end castings for insulated hinges.

Two carloads of bare wire, 1,800 poles, one carload of insulators, overhead frogs and crossovers have been ordered by the Union Traction Company of Indiana, Anderson, Ind. Berlin Street Railway, Berlin, N. H., has placed orders for 25 iron pole brackets and 100 trolley ears. Poles, wire and line material for a double-end siding have been ordered by the Beech Grove Traction Corporation, Indianapolis, Ind. The Brantford Municipal Railway, Brantford, Ont., has ordered 30 trolley ears.

Track Materials

One hundred tons of 122-lb. girder rail, 120 pairs of 30-in. rail joints and 2,400 1x4¾-in. track bolts have been ordered by the Louisville Railway. The Beech Grove Traction Corporation has ordered 500 ties and special work for a double-end siding. Rail ordered for 1928 by the Union Traction Company of Indiana amounted to 400 gross tons of 70-lb. re-laying type and 100 gross tons A.R.A. 100-lb. rail. Materials ordered by this company include one carload of track bolts, one-quarter carload of tie plates, two cars of spikes, one-half carload of bonds, approximately 50,000 white cedar ties and 25,000 creosoted ties. Brantford Municipal Railway has ordered four kegs of ⅞x4½-in. track bolts.

Five cars of ties for 1929 delivery have been ordered by the Berlin Street Railway. Other equipment ordered by this company includes ten kegs of bolts, ten kegs of track spikes and 1,000 lock washers. The Memphis Street Railway, Memphis, Tenn., is working on an extension of the Jackson Avenue car line from Watkins Street to the L. & N. Railroad. Approximately 1,000 ft. of single track remain to be laid.

Construction Projects

The first major track job to be done by the Dallas Railway & Terminal Company, Dallas, Tex., under the Everman plan will be that on Cole Avenue at a cost of approximately $125,000. It is doubtful if this rebuilding job can be started until about Jan. 1. In view of the repaving of Commerce Street, city officials are of the opinion that the tracks on this street should be rebuilt and repaved at the same time. This construction will cost approximately $138,500.

The Springfield Street Railway, Springfield, Mass., has completed its major trackwork for this year with the finish of its Benton Lawn job. Worcester Consolidated Street Railway, Worcester, Mass., has just completed the reconstruction of 2,300 ft. of track on Lincoln Street and installed a new switch and mate at a total cost of $12,000. Work has been started by this company on the underground conduit line from Chandler Street between Main and Wellington and the track construction is now under way. International steel ties are being used for the first time in Worcester. A new crossover has been installed near Irving Street, and special curves are to be installed at Posner Square and Penn Avenue. Lynchburg Traction & Light Company is repairing tracks in connection with the repaving of Rivermont Avenue. The city of Miami, Fla., has laid 260 ft. of new track on First Street and has graded 150 ft. for a track installation in the extension of Southwest and Third Avenue.

Cars and Equipment

Twelve new cars have been ordered by the Hamilton Street Railway, Hamilton, Ont., from the National Steel Car Company. Beech Grove Traction Corporation, Indianapolis, Ind., contemplates the purchase of one double-truck car and trucks for remodeling another car. This company also contemplates electrical equipment necessary for this new car and has ordered one International 15-passenger parlor coach. The Berlin Street Railway has remodeled one car and has ordered door brackets, step brackets, scraper brackets, posts and panels at a cost of approximately $200.

Brantford Municipal Railway has ordered 2 tons of brakeshoes, and two cases of 36-watt lamps. Louisville Railway has ordered 22 treadle door-operating devices and 22 illuminated signs for the remodeling of 22 Birney safety cars. This company has just received nine Studebaker street car type 21-passenger buses and has on order five Studebaker street car type 21-passenger buses and two Studebaker parlor car type 14-passenger buses. It has also received two Mack 29-passenger buses. The Connecticut Company, New Haven, Conn., has ordered seventeen treadle step equipments.

Midland Utilities Company, Chicago, Ill., is planning a power substation and extensions in line and other improvements at Gary, Ind. Berlin Street Railway has ordered one Westinghouse rotary converter at a cost of approximately $3,000. The Connecticut Company has ordered one compression riveter. Preparations are being made by the Indianapolis & Southeastern Railroad, Indianapolis, Ind., to move its general offices in Rushville, Ind., to the remodeled freight office.

$800,000 Viaduct for Dallas

Construction of levees along the Trinity River between Dallas proper and that part of the city known as Oak Cliff will require the building of a new viaduct by the Northern Texas Traction Company, Fort Worth, Tex., to replace the one which now connects these two parts of the city. The proposed viaduct will cost approximately $800,000. Plans are under consideration by the city commission for joining with the Northern Texas Traction Company in this project so that the viaduct may be for the use of vehicular as well as street car traffic. Although the viaduct will be used by the Dallas Railway & Terminal Company, the cost of its construction will be paid by the Northern Texas Traction Company.

Interborough May Order More Tokens

The first supply of 7-cent tokens has been delivered to the Interborough Rapid Transit Company, New York, N. Y. Six millions of these tokens, which are made of German silver, have been ordered from at least three companies. It is known that the Johnson Fare Box Company of Chicago has delivered the bigger part of its order for 2,000,000 tokens. The other companies, said to have similar contracts, are the Meyers & Wentz Company, Chicago, and the Scovill Company, Waterbury, Conn.

The Interborough Company expects to increase its order to 16,000,000 tokens if the United States Supreme Court upholds its claim to an increase in fare. The tokens are slightly larger than the nickel.

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Springfield Track Relocation Approved

The Public Utilities Commission has approved the new location of tracks petitioned by the Springfield Street Railway, Springfield, Mass., in connection with the new road on the Chicopee line, and relocation on State Street, Springfield, from the Commercial High School to Saint James Avenue. The track location on Chicopee line will involve laying rails in the center of the new road with double track from the Bosch magneto plant to the Springfield Rendering plant, and single track beyond.

Buyers and Sellers Adopt Code

That full confidence between both buyer and seller is the greatest need of American business today, was the unity of feeling expressed at a meeting of eminent business executives held recently at the Commodore Hotel, New York City. It was the nucleus of a committee appointed at a conference held last May of representative manufacturers, sales executives, purchasing agents, and business paper editors which had been called by the National Association of Purchasing Agents to consider the subject of "Profitless Prosperity," the responsibilities of the purchasing agent for the lack of profits by many manufacturers, and, if possible, to arrive at a practical and workable solution.

A code, previously prepared by a group of the N.A.P.A. and endorsed by a number of very large organizations to whom it had been submitted, was unanimously adopted. This code or platform of sales and purchasing co-operation is as follows:

Unnecessary sales and purchasing expense is an economic waste, a tax on legitimate industry. Its elimination will assure satisfactory profits to the producer, economy to the consumer, and greater efficiency in commercial relations.

We recognize that the concern which buys must also sell, that buying and selling are companionate functions, that sound commercial transactions must be mutually profitable, and that co-operation between buyer and seller will reduce the cost of purchasing, sales and distribution with consequent benefits to industry as a whole.

In furtherance of these principles, we subscribe to the following standards in our buying and selling.

1. To buy and sell on the basis of *value*, recognizing that value represents that combination of quality, service and price which assures greatest ultimate economy to the user.

2. To respect our obligations and neither expressly nor impliedly to promise a performance which we cannot reasonably expect to fulfill.

3. To avoid misrepresentation and sharp practice in our purchases and sales, recognizing that permanent business relations can be maintained only on a structure of honesty and fair dealing.

4. To be courteous and considerate to those with whom we deal, to be prompt and businesslike in our appointments, and to carry on negotiations with all reasonable expedition so as to avoid trespassing on the rights of others to the time of buyers and salesmen.

5. To avoid statements tending to injure or discredit a legitimate competitor, and to divulge no information acquired in confidence with the intent of giving or receiving an unfair advantage in a competitive business transaction.

6. To strive for simplification and standardization within the bounds of utility and industrial economy, and to further the development of products and methods which will improve industrial efficiency.

7. To recognize that character is the greatest asset in commerce, and to give it major consideration in the selection of customers and sources of supply.

8. To adjust claims and settle disputes on the basis of facts and fairness, to submit the facts to arbitration if a mutual agreement cannot be reached, to abide by the decision of the arbiters, and to resort to legal measures in commercial disputes only when the preceding courses prove ineffective.

9. To provide or accept no gifts or entertainment in the guise of sales expense, where the intent or effect is to unduly prejudice the recipient in favor of the donor as against legitimate competitors.

10. To give or receive no bribes, in the form of money or otherwise, in any commercial transaction, and to expose commercial bribery wherever encountered for the purpose of maintaining the highest standard of ethics in American industry.

Simplified Practice Gains Supporters

Simplified Practice, or the elimination of waste in industry through simplification, gained 1,705 supporters during the third quarter of 1928, according to Ray M. Hudson, assistant director of the Bureau of Standards, in charge of the commercial standards group.

At the end of the second quarter of this year there were 9,754 individual firms and 883 trade associations supporting simplified practice recommendations. At the end of the third quarter there were 11,319 individuals and 1,023 trade associations.

Commenting on this gain in acceptors, Mr. Hudson said, it was "apparent that the consumers were becoming better acquainted with the benefits that result from buying the simplified or standard lines. The simplified line not only gives purchasers better value in the form of improved quality of product, and cheaper prices, but it makes delivery and replacement a simple problem, since the manufacturers can produce for stock, thus insuring a sufficient supply of the commodity will be on hand with the merchants and jobbers."

Weekly Business Conditions

Measured by the value of check payments, the volume of business during the week ended Oct. 27 was somewhat smaller than in the previous week, but showed a substantial gain over the same period of last year, according to the weekly statement of the Department of Commerce. Operations in steel plants showed a slight decline in activity from the preceding week but were on a higher plane than at this time a year ago. Prices for iron and steel continued to show further slight recovery, exceeding for the first time this year the level which prevailed a year earlier. Prices for copper were stronger than in either the previous week or the same period of last year.

The value of new building awards during the week showed a higher daily average than in either the previous week or the same period of last year. Bond prices showed no change from the preceding week but were lower than a year ago. Interest rates for both time and call funds averaged higher than in either the preceding week or the same week of 1927. Stock prices reached a new high level during the week.

The output of bituminous coal during the week ended Oct. 20 showed a decline from the previous week but was greater than in the same week of last year. Petroleum output, though showing a fractional decline from the preceding week, was greater than in the same period a year earlier. Freight car loadings for the latest available week were larger than in the corresponding period a year ago.

WEEKLY BUSINESS INDICATORS
(WEEKS ENDED SATURDAY. AVERAGE 1923-25 = 100)

	1928				1927			
	Oct. 27	Oct. 20	Oct. 13	Oct. 6	Oct. 29	Oct. 22	Oct. 15	Oct. 8
Steel operations	113.2	115.8	115.8	113.2	86.0	84.0	87.0	86.0
Bituminous-coal production	.....	111.1	115.7	113.3	102.8	105.5	108.3	105.5
Lumber production	.....	92.3	90.9	90.9	104.5	105.5	106.4	108.6
Petroleum production (daily av.)	.....	120.2	120.3	121.2	118.4	119.2	119.7	121.3
Building contracts, 37 states (daily average)	144.9	135.7	134.3	180.6	131.8	152.0	115.1	117.6
Price iron and steel composite	86.1	85.9	85.6	85.3	85.8	85.9	85.9	87.1
Copper, electrolytic, price	.....	110.1	108.7	108.7	94.2	93.5	94.2	93.5
Interest rates, call money	160.6	157.6	157.6	178.8	84.8	93.9	97.0	100.0
Interest rates, time money	160.0	155.3	165.7	165.7	102.9	100.0	97.1	100.0
Federal reserve ratio	87.7	86.8	87.2	89.5	97.2	96.9	96.8	96.6

Manufacturing Activity Highest

Manufacturing plants of the nation closed the third-quarter of the year with operations at the highest rate ever recorded by American manufacturing industry in general. Reports received by *Electrical World* on the monthly consumption of electrical energy by some 3,600 manufacturing plants scattered throughout the nation and in various industries indicate that the operations of these plants during September, after corrections are made for the number of working days, were 11.4 per cent over August, 13.5 per cent over September of last year, and 5.4 per cent above the previous high rate of productivity recorded last February. The average rate of operations in the manufacturing plants.

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during the first nine months of the year was 5.3 per cent above that during the same period last year. This is about 2 per cent higher than the generally accepted normal rate of annual growth in American productive activities.

U. S. Buses Abroad

According to the United States *Commerce Reports,* American buses are scattered all over the civilized world to a great extent. In Aden, the British port of the Arabian Gulf, there are no less than 80 American buses running, which is only five less than are being used in Australia and Tasmania. In the little Azores Islands, 95 American buses are used; 75 are in use in British West Africa; the Canary Islands have 60; and Ceylon 97. Korea has 99 American buses in operation; and China has 92. The Rock of Gibraltar uses 60 American buses; British Guiana, 96; while Guam, and the Philippines each has an even 100. The little British Island of Hong Kong has 78; Iraq uses 50; Mocalla uses an even 100; and so does Tonga; while Palestine uses 93.

Altogether, *Commerce Reports* shows there are 6,084 American buses in use in 119 foreign countries.

New Screw Thread Report

In the interval which has elapsed since the publication of the National Screw Thread Commission's 1924 report several screw thread standards, which were then in the early stages of development, have been completed. Progress and change in industrial methods also have necessitated some revision of the standards promulgated. The second revision of the report of the commission, which is to be known as the 1928 report, has now been prepared and approved for publication. Those desiring to be notified when the report is available may send their names to the commission, at the Bureau of Standards, Washington, D. C.

Coal Conference to be Held

More than a hundred speakers representing twelve countries are tentatively listed to present papers at the Second International Conference on Bituminous Coal to be held under the auspices of the Carnegie Institute of Technology in Pittsburgh, Nov. 19 to 24, 1928, according to a preliminary program announced by President Thomas S. Baker. Major subjects to be discussed, it is expected, will include "Pulverized Fuel," "Gas Production," "Liquefaction and Hydrogenation," "Fertilizers," "Origin, Composition and Classification of Coal," "High Temperature Carbonization," "Combustion in Furnaces," "Purification and Cleaning," "Tars and Oils," and "Low Temperature Processes."

The chief purpose of the coming conference will be to present the results of recent studies of coal that have to do with improved methods of utilization and combustion. The list of speakers includes the world's leading authorities on the latest developments in improved utilization of coal as a source of energy and power.

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

	Oct. 30, 1928
Metals—New York	
Copper electrolytic, cents per lb	15.775
Copper wire, cents per lb	17.875
Lead, cents per lb	6.5
Zinc, cents per lb	6.60
Tin, Straits, cents per lb	49.25
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.40
Somerset mine run, f.o.b. mines, net tons	1.90
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.375
Central, Ill., screenings, Chicago, net tons	0.675
Kansas screenings, Kansas City, net tons	1 875
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.3
Weatherproof wire base, N.Y., cents per lb.	18.625
Cement. Chicago net prices, without bags	2 50
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10 5
White lead in oil (100-lb. keg), N. Y., cents per lb	13.25
Turpentine (bbl. lots), N. Y., per gal	$0.5925

Detroit May Build Cars

Mayor John Lodge of Detroit has instructed the Street Railway Commission to proceed at once with the preparations for the manufacture of its own street cars in the municipal shops in Highland Park. According to the president of the commission the department will be prepared to manufacture cars within 90 days, and although it is believed that the first 50 cars will cost in excess of the purchase price, the department will then be in a position to build its cars as cheaply as they can be built any place else. Trailers have been built in the Highland Park shops for several years.

G. Ogden Ellis, president of the commission, cited that the D.S.R. now owns 1,690 cars, 450 of which are now fifteen years old and 125 of which are twenty years old. There are 213 one-man cars.

TRADE NOTES

COPPER-WELD STEEL COMPANY, Glassport, Pa., announces that Lowell S. Monroe, former advertising manager for the Electric Controller & Manufacturing Company, is now a member of the Copperweld engineering staff. Mr. Monroe will be engineer in charge of service data.

ROLLER-SMITH COMPANY, New York, announces the appointment of Wise & Braisted, General Motors Building, Detroit, Mich., as its district sales agent in the state of Michigan.

WAGNER ELECTRIC CORPORATION, St. Louis, Mo., announces the addition of R. W. Piper to its transformer sales division. Mr. Piper will travel the southeast district, including a section of West Virginia and the state of Virginia, North Carolina, South Carolina, Alabama and Florida. This company also announces the transfer of H. D. Epting from its Philadelphia sales office to the Atlanta sales office.

NATIONAL PAVING BRICK MANUFACTURERS ASSOCIATION has moved its offices from Chicago to 1245 National Press Building, Washington, D. C.

E. C. BROWN, who has been connected with the Ohio Brass Company, Mansfield, Ohio, for 21 years, is retiring from active duty and moving to California, which has been his plan for some time.

ADVERTISING LITERATURE

CURTIN-HOWE CORPORATION, 11 Park Place, New York, N. Y., has issued a booklet entitled, "A Technical Discussion on Zinc Meta Arsenite." Zinc meta arsenite is the wood preservative developed by the Western Union Telegraph Company. The booklet is made up of three sections. Part 1 is entitled "Chemical Reaction of Wood Destroying Fungi." This was an address before the American Wood Preservers' Association at Montreal last January by Dr. L. P. Curtin, chemist of the Western Union Telegraph Company. Part 2, entitled "Chemistry and Toxicity Data" was prepared by Dr. Curtin as a supplement to part 1. Part 3, "Weathering and Field Tests," is a paper presented before the American Wood Preservers' Association at Montreal last January by Paul J. Howe, construction engineer, Western Union Telegraph Company.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, East Pittsburgh, Pa., has issued a fourth volume of its book on "Cars and Car Equipment." This issue, known as special publication 1816, includes photographs, floor plans and complete information on equipment, dimensions and service capacity of nineteen modern types of cars purchased during the past year. Copies of this publication may be obtained by writing either to the nearest Westinghouse district office or to the advertising department at East Pittsburgh.

LINCOLN ELECTRIC COMPANY, Cleveland, Ohio, has recently published a supplement to its 160-page textbook, "Arc Welding—The New Age in Iron and Steel." This 32-page supplement is entitled "How to Begin the Application of Arc Welding in Production Manufacturing." The bulk of the text is devoted to the re-design of machinery. In developing the theory of arc welded design many line drawings have been used which show how standard steel shapes are utilized to build up structures which formerly would be cast. Along with these theoretical designs, are shown photographs of similar designs which are in actual use. The Lincoln Electric Company plans to distribute the supplement without charge to all present owners of the parent textbook. Individual copies of the supplement can be obtained at a small charge from the company.

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Brill 201-B-1 Seats for Fairmont Car

The Fairmont Car, built by Kuhlman for the Monongahela-West Penn Public Service Company and exhibited at the Convention, is equipped with Brill 201-B-1 Seats. This particular selection of seating equipment was based on the proven principle that the utmost in seating comfort and construction pays the best returns.

These seats are the reversible, semi-individual type and constructed with deep spring cushions and backs. They are upholstered in brown Spanish grain leather and are exceptionally attractive and comfortable. Convention delegates were enthusiastic and voiced their praises of this type seat.

Specify Brill Seats—it pays.

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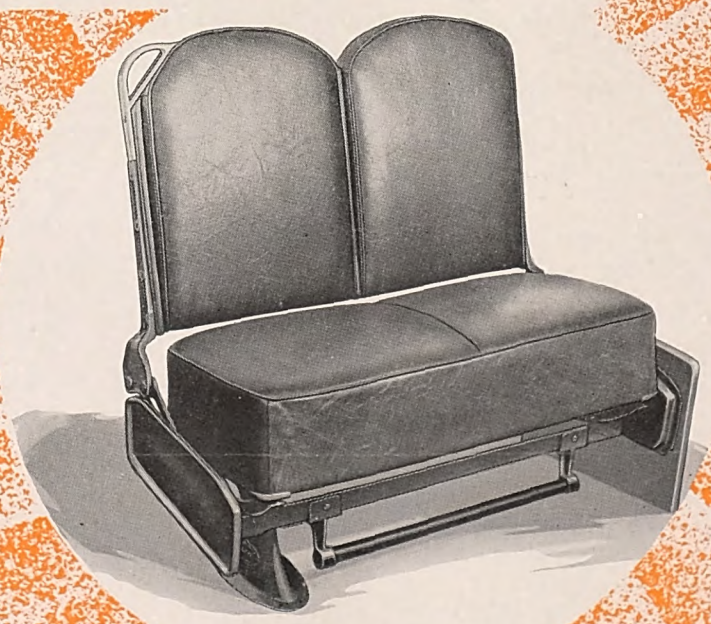
AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.
Pacific Coast Representative: Rialto Bldg., San Francisco



Brill Seats Build Transportation Sales

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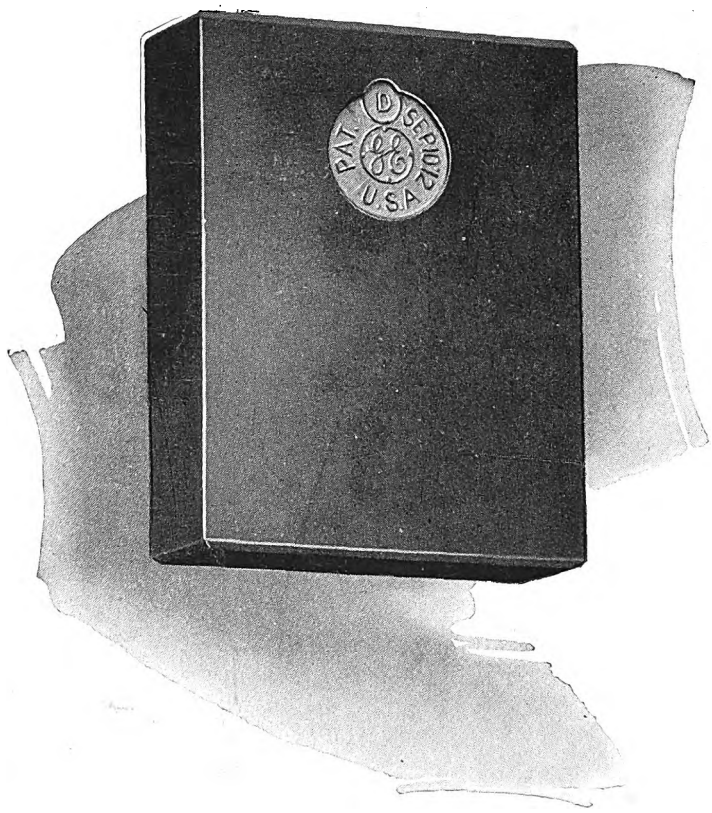
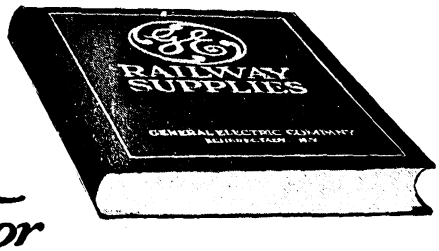
A Who's Who— of G-E Carbon Brush Users



Berkshire Street Ry. Co.
Boston Elevated Railway
Brooklyn Manhattan Transit Corp.
Connecticut Company
Georgia Railway & Power Company
Hudson & Manhattan Ry.
Key System Transit Co.
Market Street Railway
Milwaukee Electric Railway & Light Co.
New Haven and Shore Line Railway Co.
New Orleans Public Service Co., Inc.
New York Central Railroad
New York & Stamford Railway Co.
Schenectady Railway Co.
United Traction Company

These regular users of G-E carbon brushes are among the many properties that have found them an important help to the continuously dependable operation of railway motors.

Satisfied users are the best advertisers of any product. Like all other General Electric equipment, G-E carbon brushes have behind them the resources and engineering facilities accumulated during 30 years of manufacturing experience.



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ELECTRIC RAILWAY JOURNAL

raw-Hill Publishing Company, Inc. NOVEMBER 10, 1928 Twenty Cents Per Copy

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STRONG—stronger because forged from high-carbon steel, lighter for that reason as well.

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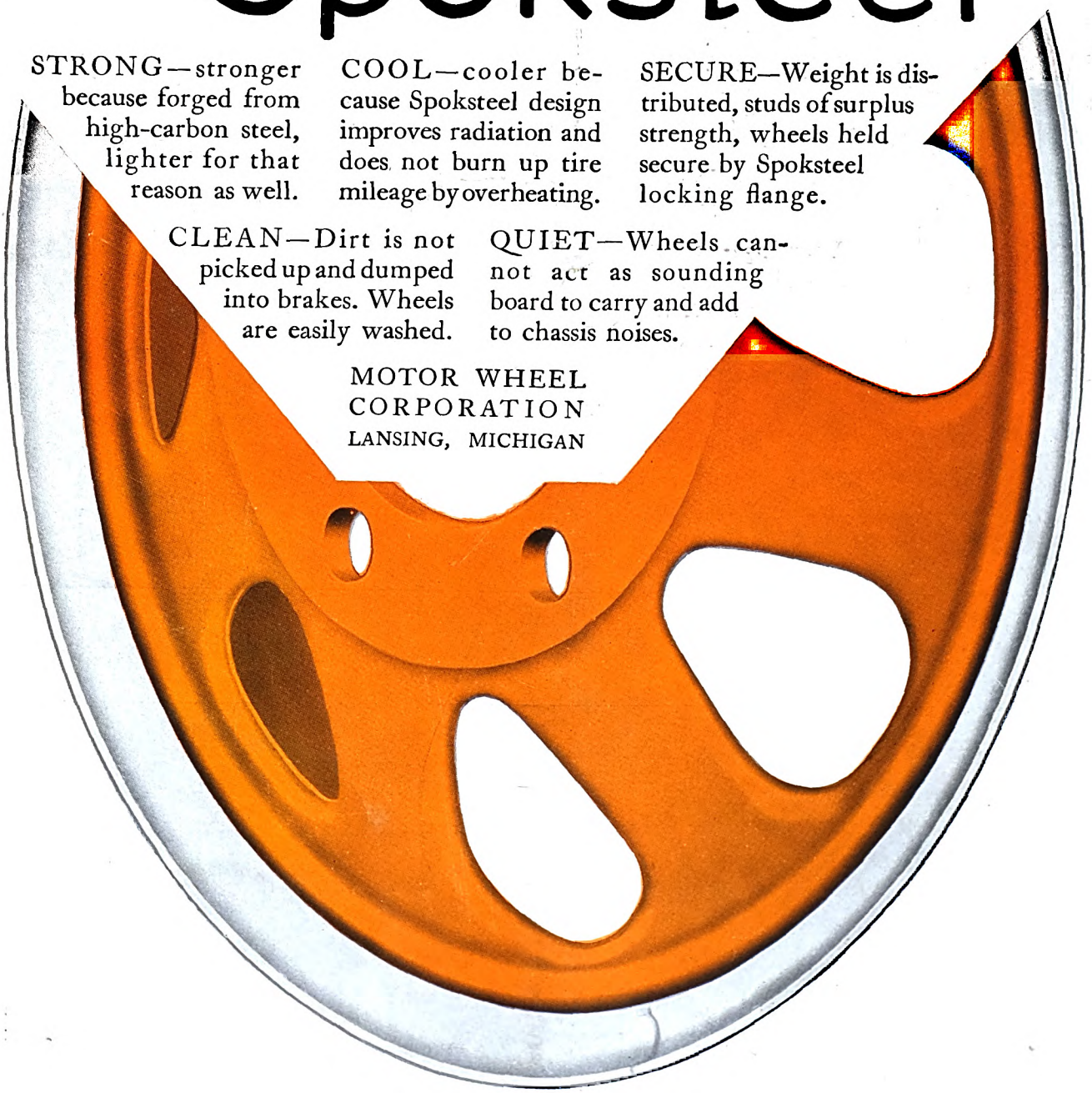

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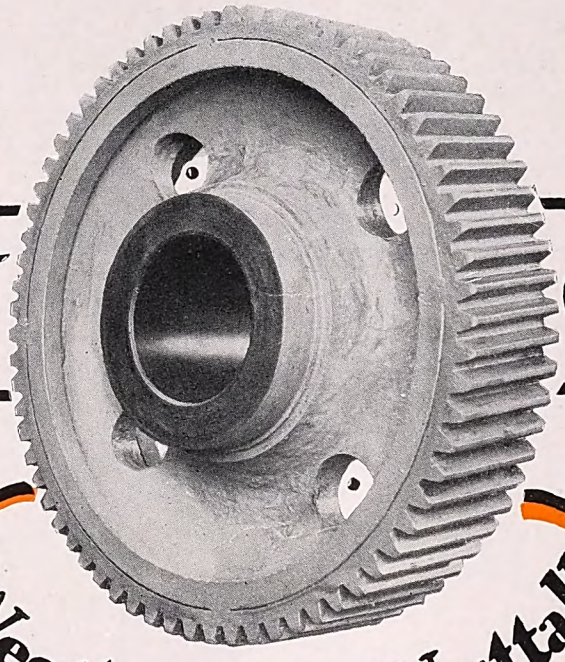
QUIET GEARS



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The helical teeth of gear and pinion transfer the load with a smooth sliding rolling motion without vibration, noise or shock. This means that wear is minimized, and even when worn they do not chatter.

And to this gear has recently been added a new development that definitely eliminates the slightest ringing sound produced in the gear itself.

It will pay you to investigate this noiseless Gear if you want smooth, quiet and efficient operation.

All Westinghouse-Nuttall Products are sold through the Westinghouse Electric & Mfg. Co. district offices. Refer your inquiries to the nearest Westinghouse office.

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Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. McGRAW, *President*

Consolidation of Street Railway Journal and Electric Railway Review
CHARLES GORDON, *Editor*

LOUIS F. STOLL, *General Manager*

Volume 72 New York, Saturday, November 10, 1928 *Number 19*

The Nation Shows Good Business Judgment

ONCE again the American public has proved its ability calmly to weigh principles, even in the face of strong appeals to the heart and the emotions. This it has done by overwhelmingly expressing its choice of Herbert Hoover for President of the United States. It admired Governor Smith's qualities of personal magnetism, integrity and courage, but it chose Hoover for President. In that it showed good business judgment.

True, it is probable that tradition, emotion and prejudice played a part in the vote on both sides, but the public had the facts as never before. Never were the issues in a Presidential campaign carried to so wide an audience. For this the radio is largely responsible. It is quite apparent that the new medium of communication permitted the great mass of the American public to judge at first hand between candidates and issues. The result indicates that America's future rests secure upon the ability of its people to sift out of the many phases of a national contest, those issues which are of really vital importance to the country's welfare and continued development.

For the first time since the industrial revolution began to change the character of industry and business, "big business" as such was not an issue. True, one or two big businesses were verbally tarred and feathered for the entertainment of the mob, but it seems quite evident that the voters gave more attention to principles than to fire-works.

In choosing Herbert Hoover as President, the people of the United States have shown that they understand the warning he sounded against the extension of government into business, under whatever guise it may be attempted. They have recognized that social and even moral well-being are founded upon economic health. And they have expressed their determination to continue to build America's future upon the foundation of individual intiative. But they have done more than all of this in that they have chosen to put the affairs of the nation into the hands of an executive who by training, experience and temperament is probably better qualified than any other living man to understand and to deal wisely with the complexities of our delicately adjusted modern economic structure.

Seen Through Bankers' Eyes

CARDINAL NEWMAN, the English stylist, says that the great author is not one who merely has a *copia verborum* and can turn out at his will any number of splendid phrases and swelling sentences, but he is one who has something to say and knows how to say it. This is the test that the report of the public service securities committee of the Investment Bankers' Association meets. It is a lucid presentation. In the space of about 750 words the committee has reviewed the situation of the electric railways from the dark days of 1920 to the present. This discussion of the status of the local transportation industry by a committee of financiers, is of particular interest and significance.

The statement is made that the industry's survival in the face of the difficulties with which it has been beset is proof of the basic necessity of the service which the railways are rendering. The bankers also recognize that the tension between the railways and the public which they serve has lessened materially and they see in this evidence of an improvement in public understanding of the problems of the railways. The bankers see in recent violent public discussions of the fare problem a factor that is bringing many companies out into the light for public inspection, and they express the opinion that the industry has profited by this. The committee takes cognizance of the speech of Owen D. Young at the recent convention in Cleveland. It calls attention to the fact that the remarks of Mr. Young, an international figure, secured national publicity for the idea that the electric railway is an essential industry, that private ownership is preferable to public ownership, that traffic congestion must not be permitted to fetter public transportation, and that fares must be commensurate with the cost of giving service. The bankers say that not even the most optimistic electric railway men believe the industry is out of the woods yet, or anywhere near it, but they are now certain that the fear of extinction was merely a nightmare; that the bottom has been touched and the way is now upward. All this is doubly significant, since these remarks are made by men against whom no charge of special pleading can be sustained—men not prone to exaggeration of statement.

Raising the Entrance Requirements

REALIZATION is growing among electric railway executives of the value of specialized employee selection and training. As the results achieved by scientific selection of new employees become available on those properties that are pioneering in this important phase of management, there is every indication that the employment office may be expected to receive increased attention as a laboratory for raising the standards of public transportation service. There is further evidence that the investment which is being made by some properties in personnel and facilities for specialized training of employees is producing an attractive return in the form of men better qualified for their work. If scientific selection is justified, it must reduce the percentage of misfits on car platforms. Similarly, specialized educational and training activities must have as a definite objective the development of a better-informed, more alert and more courteous personnel.

It was with these general thoughts in mind that the training work of the transportation department of the Milwaukee Electric Railway & Light Company, as outlined elsewhere in this issue, was reorganized early in 1926. The training division was made an operating unit of the transportation department with a supervisor re-

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sponsible to the educational department for his methods, and to the transportation department for their application. This indicates that the management was well convinced of the value of the instruction work previously carried on in Milwaukee. The present improved and amplified methods of selecting trainmen have shown their worth in the bettered records of new men, as compared with the performance of former recruits. As the caliber of the new employees has been raised, the training division has had increased opportunity for intensive education. No system of training can surmount the barrier established by the intelligence limits of the men available. Therefore, in raising its "entrance requirements" through scientific selection, the company is multiplying the possibilities of its training courses.

That this intensive work of employee selection and training is decreasing the number of chargeable accidents, increasing the equipment-miles operated per pull-in, bettering the record of labor turnover and raising the standards of intelligence and salesmanship displayed by employees, is indicated by the statistics cited in the article this week. The experience of the Milwaukee company parallels that of European electric railways, most of which now conduct extended psycho-technical tests of candidates for employment as trainmen.

Taxi Mortality Attributable to Lack of Regulation

RECENT price wars among taxicab operators in Louisville, Muskegon, Seattle, Columbus, Cleveland, Providence and other cities emphasize again a fundamental weakness of the taxicab business both from the standpoint of the investor and the public. Inadequate financial return to the operator, and inferior service to the public are the inevitable results of unbridled competition in a business which by its very nature should be considered as a public utility. But in most cities the operation of taxicabs falls far below the level of a responsible and well-organized utility service. True, there are well-managed taxi services in some cities, meeting a real need, but by and large, neither the performance nor the history of the business is auspicious. If the financial manuals are to be relied upon, the records of even the larger companies do not show that their earnings have been commensurate with the opportunity that exists for making a fair profit and building a stable industry.

Many elements tend to give the taxi business a high mortality rate. The most important of these is uncontrolled competition, and the conclusion appears inescapable that the recent rate wars are a reflection of financial desperation on the part of the owners. It is this contingency that stands in the way of organization of the taxicab business on a sounder basis, and prevents its co-ordination with other forms of public transportation service. The benefits that would accrue to the public from such co-ordination, in the form of improved organization, better and more reliable service and responsibility of the operator, are illustrated in Philadelphia and Minneapolis, where the railways have gone into taxicab operation. The advantage of co-ordination from the standpoint of eliminating needless duplication, and consequently reducing traffic congestion is apparent.

In the cities where rate wars have been waged among the taxis, the effect upon the railways has not been serious. If they have done one thing more than another, these rate wars have emphasized the need for regulation. Eventually, this must come, and when it does, the taxicab business itself as well as the public will be the gainer. The question of regulation is of primary importance to no other interest. It is probable, however, that the elimination of cut-throat competition in this field would open the way for more widespread co-ordination of this form of service with other public transportation agencies. It is somewhat surprising that responsible operators and manufacturers of taxicabs have not taken the initiative in sponsoring regulation. If they cannot be brought to subscribe to this need, there is little occasion for shedding tears over the spectacle of the increased mortality among the operators.

Analyzing the Cause to Prescribe a Cure

ELIMINATION of street traffic delays is only part of the problem confronting electric railways in providing better service. Study of the countless other causes of delay reveals many ways of increasing schedule speeds and effecting other improvements. Often it is desirable to conduct extensive surveys to discover these causes. Some few companies have staffs which continually are making analyses of conditions with the thought of improving the service.

As evidence of what can be done with such surveys, several important railways have steadily increased their schedule speed without any change in equipment. One company employs as traffic engineers technical graduates who have been thoroughly trained for the work by a development course of several years' duration. These men make thorough analyses from time to time of different lines at critical locations in the city. Their reports include recommendations for improvements, and time-tables which will take advantage of these improvements.

On the theory that delays do not merely happen but rather are the result of definite causes, the traffic engineer will find ways of eliminating, wherever possible, the causes of delay. Many other elements can be investigated, some of which are charged to conducting transportation, while others are due to the physical equipment. Such an investigation may well include handling of passengers at concentrated loading points, supervisory attention given the line, attitude of the trainmen and petty difficulties militating against service betterments. In addition, many phases pertaining to traffic movement may be investigated, as the enforcement of regulations directly or indirectly affecting the movement of cars, the need for special traffic or parking regulations and the efficiency of signal lights or officers at important intersections.

Study of the physical equipment of a line may include the checking of switching facilities, adequacy of energy supply, installation of loading zones, wherever possible, lighting of stopping places, and terminal facilities. Different types of equipment may be found best suited for particular lines, and route changes may make the service more effective.

Many discoveries are made by one on the alert. Changing of methods and equipment require more time and greater perspective than the transportation man can give. They are important to the progressive electric railway. To get the best results specially-trained men are needed to conduct surveys at regular intervals.

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"Light Equipment" Move Backed By Our Sister Industry

THE possibilities of securing lighter rolling stock and all the advantages and economies which that means were emphasized at the talk on aluminum and its alloys at the meeting of the Metropolitan Section, A.E.R.A., on Oct. 5. The facts given by the speaker, Dr. Paul W. Faragher of the Aluminum Company, on the extent to which this metal has already been used in steam and electric railway car construction in this country, must have been quite a revelation to many who have not followed recent developments along this line. During the past six years the trunk line railroads have put in operation more than 350 passenger cars in whose construction aluminum alloys are extensively employed for the sake of lightness. Electric roads have built more than 100 cars in which aluminum played a large part.

Significantly, all of the group of 350 cars are in use on lines which are now, or soon will be, electrically equipped. This indicates that the saving in energy required for propulsion was the chief aim sought. Obviously, similar savings would follow the use of lighter equipment in steam service, but it is more evident and more easily measured when electric power is used.

It is also a well-known fact that aluminum alloys have been used in the construction of some of the reciprocating parts on steam locomotives, such as connecting rods, where there are marked advantages in the way of maintenance following the use of light material, in addition to the energy saving. European electric railway and bus companies have also used aluminum alloys extensively in the body construction of their vehicles, though in this case it has been more for side and end sheathing with a wooden frame, than for the framework itself.

That the steam railroads are behind the lighter equipment campaign is highly significant. Operating a heavier class of rolling stock than that used in our industry makes it imperative that the material from which the equipment is constructed should be both highly durable and safe beyond question of a doubt. The field is a fruitful one for study in the direction of reducing car and track maintenance as well as energy costs.

Science and Knowledge No Respecters of Persons

PROF. H. A. OVERSTREET has written a book "About Ourselves." The obvious thing to say, and the true thing, is that professors are always writing books. But in this instance the professor's work compels interest. He differentiates between two types of individuals, the expansives and the contractives. He says that the mind that is predominantly inquiring is expansive. It does not hold itself fixed in dogma or in absolute value. It presses out to the still unknown, "aiming to extend the area of its intelligent comprehension." That, of course, is a little pedantic. But the professor elucidates by saying that "the inevitably distrustful person is a contractive. He holds off others at arms length, refuses them admittance to his councils, and his confidence. He is widely distrustful—of persons, ideas, movements, motives, of the age in which he lives. He is unable to join in with anything or anybody."

The professor had the individual in mind, but the qualities—or the lack of qualities which he enumerates—are not necessarily limited in their applicaton to individuals. An industry or a part of an industry may be predominantly contractive. That industry or that part of it to which this quality applies surely is on its way to obscurity. By and large, the electric railway industry is an expansive industry. It has widened the field for the use of its products. It is adapting itself to changing conditions. It is striving to improve the living conditions of its workers.

Contractive elements within the industry have been and still are in evidence. But there is every indication that those who have acted at times with an eye only to the present are conspicuous by the difficulty in locating them. In other words, the number of contractives has been on the wane for several years. The advice of a diagnostician is not necessary for the individual to determine in which of the classes he belongs—whether he is a contractive or an expansive. If he cannot decide for himself, there is little hope for him in a world in which science and economics, like time, are no respecter of persons.

Dogmatic Standardization Decreases Vitality

STANDARDIZATION has been accepted as essential to the reduction of costs and the elimination of waste in industry. The Department of Commerce, through widespread co-operative effort, has brought about considerable progress in standardization and in the simplification of products and practices. From the design of large power apparatus, down to the selection of types and sizes of screw threads, the possibilities of economy through this process play an important part.

But there is another and even more vital force in modern industry. That is research and the development which results from its application. In a measure the forces of research and standardization are opposed. The former tends to overcome the latter and the latter tends to check the former. In a sense research is dynamic; standardization, static. Research overcomes difficulties, improves the product and extends the horizon of an industry. Standardization conserves resources, eliminates waste and reduces costs. Thus there must be constant compromise between these two forces. Otherwise there is danger of waste on the one hand or stagnation on the other.

When standardization becomes an end in itself rather than merely a means to an end there is grave danger to an industry. When it is permitted to stand in the way of adoption and use of needed new developments, then standardization defeats its own purpose. A recent illustration of this condition comes to mind in the electric railway industry. On a particular property almost the entire organization was sold on the merits of a new device. The engineers of the organization had conducted a sufficient number of tests to feel confident that it would reduce their costs. However, because the chief executive of this property had made almost a fetish of standardization, his subordinates dared not recommend the use of this new product, even though they were convinced that the present part should be replaced with a better one.

Research men claim that the relative vitality of industries may be measured by their attention to research and particularly by the time lag required between the conception and application of a new idea. Dogmatic administration of standardization materially increases this time lag, and thus decreases an industry's vitality.

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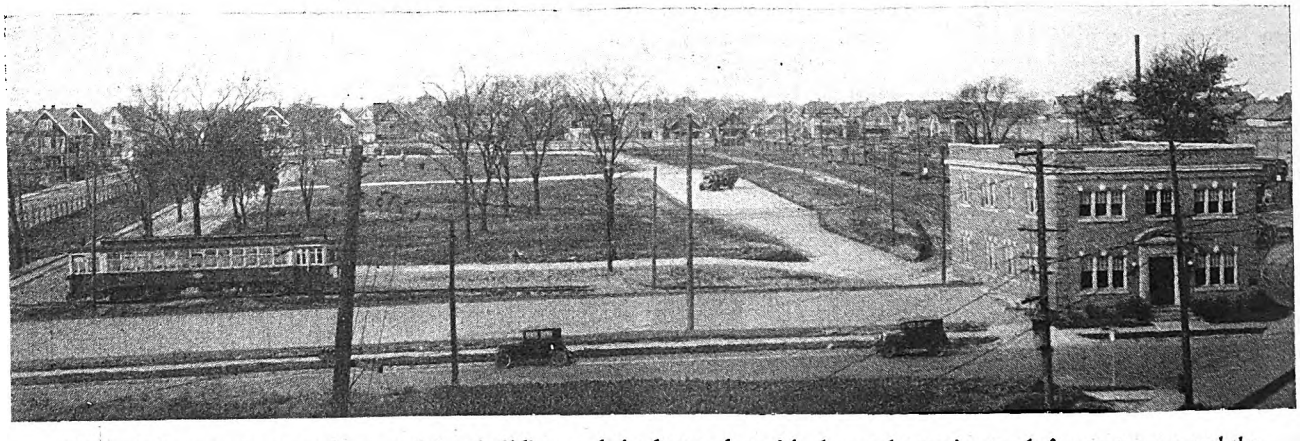
Specialized Employee Training Pays

in Milwaukee

Analysis of car and bus operation records for past five years in Milwaukee show results that amply justify the unusual methods of employee selection and training used



View of the two-story employee training building and the large plot with the oval practice track for motormen and the macadam road for bus drivers

WILL specialized training pay? This question was asked by the Milwaukee Electric Railway & Light Company when it reorganized its training division in 1926. So that definite results from a training program could be checked readily and the question answered satisfactorily, the training department was established as a separate division of the transportation department, and a supervisor of training appointed. This supervisor was made responsible to the educational department for methods of training and to the transportation department for their application. Training work was, in this way, accepted as an integral part of the operation of the company.

Studies were made of the jobs for which training methods needed to be devised. The work ahead was outlined, and the following definite objectives were established:

1. *Reduction of Labor Turnover*—Employing and training new men is always a costly matter. While there are many factors which effect labor turnover, it was felt that if the proper men were first selected for the job and then trained to do it well there would be fewer failures and certainly less dissatisfaction.

2. *Reduction in the Consumption of Power*—With a given piece of equipment, power can be saved only by the operator on the car, and he can reduce the energy consumption only if he understands how to handle the car properly. It was felt that if the operator could be made familiar in a practical sense with the conditions existing in his equipment under various phases of operation, he would be able to judge for himself the methods to employ in conserving power. Rules of "don't do this" and "don't do that" were considered to be ineffective.

3. *Improvement of Public Relations*—With only three written complaints from the public per million passengers carried, it seemed that little need be done to improve the public contacts of the trainmen and bus operators. There was, however, a slightly upward trend in the number of these complaints as the extension of one-man cars was in prospect, with evidences of decided opposition from many sources. It was felt that not only must the men who operated these cars be most efficient, but also that their public contacts must be of the best. Accordingly, definite training plans were organized for this purpose.

4. *Reduction of Accidents*—Accidents are always a problem, especially so in the transportation field. In studying this problem, it was felt that a competent and efficient man is synonymous with a safe one. Definite training, therefore, was planned for the prevention of accidents.

5. *Reduction of Delays Due to Uninformed Trainmen*—A study of road delays and interruptions in service indicated a lack of knowledge of the equipment on the part of the trainman operating it. It was hoped that by means of specific training, information could be supplied to all trainmen to correct this condition.

6. *Reduction of Equipment Failures Through Improvement of Operator*—To reduce equipment failures plans were made to perfect a training corps which would follow up every operator on the system periodically to check his method of operation.

Work could not be commenced on all of these objectives immediately, but a start was made on some, and as facilities for more effective training have been added, organization has been perfected to handle all of these.

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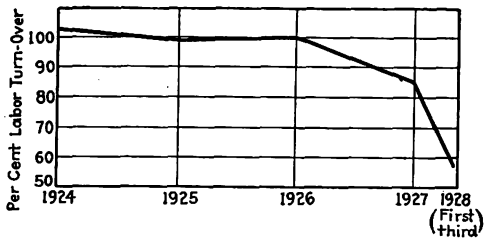

Fig. 1—Labor turnover in percentage of annual turnover during 1924, 1925 and 1926

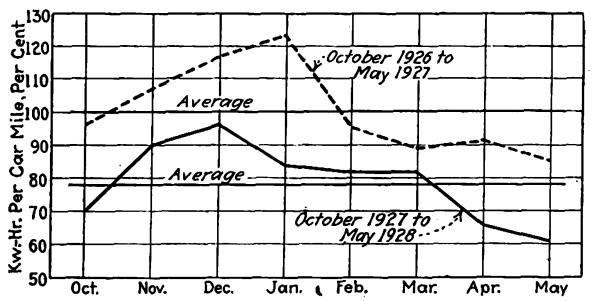

Fig. 2—Reduction in power consumption per car-mile. Instruction in power circuits commenced in October, 1927; hence the restriction of these curves to October-May periods of the last two years

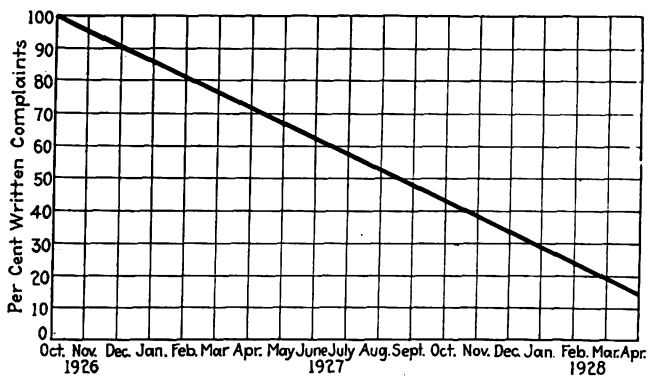

Fig. 3—Monthly average of written complaints per 1,000,000 passengers

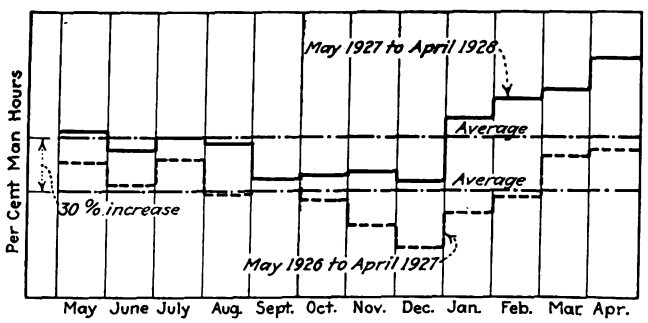

Fig. 4—Increase in man-hours worked per chargeable accident

Statistics relating to each of the foregoing objectives are compiled monthly, and the results are discussed with all those responsible for the training work. The accompanying group of graphs depicts the extent of changed conditions since the inception of the training courses. There is no intention of crediting all the improvement shown to the work of the training division of the company; unquestionably, all departments played a part in the general betterment of service, the improvement of employee morale and the reduction of accidents. Careful analysis of the results with respect to the six objectives outlined by the company shows the actual extent of the progress made:

1. Reduced Labor Turnover—The labor turnover of 1924, 1925 and 1926 was almost constant. As this was the condition at the time of the reorganization of the training work, it is taken as the base, at 100 per cent, in Fig. 1. The turnover has since been reduced to 58 per cent of what it was at that time.

2. Reduced Power Consumption—A course of instruction on the power circuits of the cars was offered in October of last year. This consisted of thirteen one-hour lessons, using equipment described in an article which appeared in the JOURNAL of June 30. Everyone in supervisory positions as well as many trainmen took the course. Systematic follow-up has been an important factor in securing results. The follow-up instructors have been giving particular attention to motormen running too long on resistance points of the controller. The data shown on the graph are for one type of car and are based on an average of 650,000 car-miles per month. The power consumption does not include that consumed by auxiliaries such as heaters and air compressor motors. The average power consumption for the year 1927-1928 has been reduced to about 76 per cent of the average for 1926-1927.

3. Improved Public Relations—It was thought that to reduce the number of written complaints on the railway service to a point below three per 1,000,000 passengers carried would be an impossible task. However, the number of complaints are now less than two per 1,000,000 passengers, with the trend definitely downward. Since 1926, about 60 per cent of the men have been trained as one-man operators. In this training public relations had a very prominent place. Training was given in calling streets, making useful announcements, using standard expressions, and in the handling of unusual situations. All other men on the system were given the same instructions through demonstrations by follow-up instructors.

4. Man-Hours per Chargeable Accident Increased—There has been a marked increase in the man-hours per chargeable accident, or a marked reduction in the number of accidents per car-mile operated. The continued divergence of the curves indicates that the improvement in this respect may well be expected to continue even in the face of increased operating speeds and a more stringent definition of what constitutes a chargeable accident.

5. More Car-Miles per Pull-In Charged to Uninformed Motormen—Schedule delays due to uninformed trainmen have been much reduced. From 1920 to 1926, the car-miles per pull-in remained practically constant. From 1926 to the present, the car-miles for this type of pull-in have been almost tripled. This improvement unquestionably has been made possible by the better facilities for training now available and the improved methods of instruction devised.

6. Reduced Number of Equipment Failures Due to Improper Operation—The reduction in the number of delays due to improper operation of the cars has been very marked. Here again, the car-miles per pull-in for this type of trouble remained about the same until 1926. From 1926 to the present, the car-miles per pull-in of this nature have been tripled. The re-instruction of men for one-man operation, coupled with close follow-up of their performance in service, plus a thorough and systematic course of instruction for repairmen, has influenced this trend for the better.

Experiments in scientific selection were conducted from 1921 through 1923. The use of these selection

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tests in the routine employment of trainmen was begun in 1925. Proper and thorough training is impossible unless trainable material is available. By furnishing this kind of material, the selection tests have had their influence on the results. Individual analyses also have been made in studying particular trainmen.

It is rather difficult to make a comparison of the selected and unselected railway operators on the basis of discharge records, since in the last year and a half a new policy has been put into effect in the transportation department, which has increased the dismissals for repeated chargeable accidents.

TABLE I—STATUS OF 168 MEN SELECTED DURING 1927

	Number	Per Cent of Total
Discharged (not including accidents)	14	8.3
Discharged because of accidents	9	5.4
Resigned	16	9.4
Failed in training or did not complete practice period	5	3.
Still in service as motormen or one-man operators	124	73.9
Total	168	100.0

TABLE II—RATING BY SELECTION TESTS OF 23 OPERATORS DISCHARGED FOR ACCIDENTS IN 1927

	Number	Per Cent of Total
Ranked above average on selection	8	34.8
Ranked below average on selection	15	65.2
Total discharged	23	100.0
Failed on motorman selection test	6	

TABLE III—REASONS FOR REJECTING MOTORMAN APPLICANTS IN 1927

Reason	Number of Cases	Per Cent of Total
Motorman selection test	45	46.8
Interview only	9	9.4
Conductor tests	7	7.3
Employment department (references, etc.)	18	18.8
Interview and test	17	17.7
Total rejected	96	100.0

TABLE IV—RE-EMPLOYMENT OF TRAINMEN AS MOTORMEN IN 1927

	Number	Per Cent of Tota
Re-employed trainmen who are still in service	30	83.4
Re-employed trainmen who left service*	6	16.6
Total re-employed	36	100.0

*Three resigned and three were discharged.

TABLE V—MAJOR OCCUPATIONS OF MOTORMEN BEFORE ENTERING SERVICE

(Including those who entered service since 1925 and those transferred to one-man operation)

Major Work	Total Employed	Number In Service	Per Cent In Service	Number Out of Service	Per Cent Discharged	Per Cent Resigned
Farmers	161	84	52.1	77	8.7	32.4
Mechanics	157	102	65.	55	8.9	24.2
Garage men	87	49	56.4	38	17.2	21.8
Laborers	48	35	72.9	13	4.2	8.3
Salesmen	27	19	70.4	8	11.1	18.5
Clerks	25	21	84.	4	0.0	16.
Miscellaneous	72	40	55.6	32	5.6	29.6

As shown in Table I the number of new men discharged because of accidents in 1927 amounted to 5.4 per cent. This figure compares favorably with the 2.9 per cent in 1926 and the 0.6 per cent in 1925. Even this figure, which may be charged to the more stringent discipline, is still a little better than one-third of the percentage of unselected trainmen who were discharged for having accidents in 1924 (14.1 per cent).

In 1926 10 per cent of the motormen selected failed in training or otherwise did not complete the practice work. In 1927 only 3 per cent similarly failed, which would seem to indicate increased success in the selection of the men, together with the employment of improved training methods.

Table II gives an analysis of the total number of men discharged with respect to their rating on the motormen selection test.

Table III shows the percentage of rejections for various reasons. Of these rejections, 18.8 per cent were made by the employment department, the remaining 81.2 per cent being made because of failure on the selection tests, the interview, or both.

Likewise, the question of re-employing men who have previously been in the company's service as motormen or conductors was investigated, as shown in Table IV.

A good many of the men desiring to re-enter the railway service had made unsuccessful ventures into businesses of their own; hence it was not surprising to find

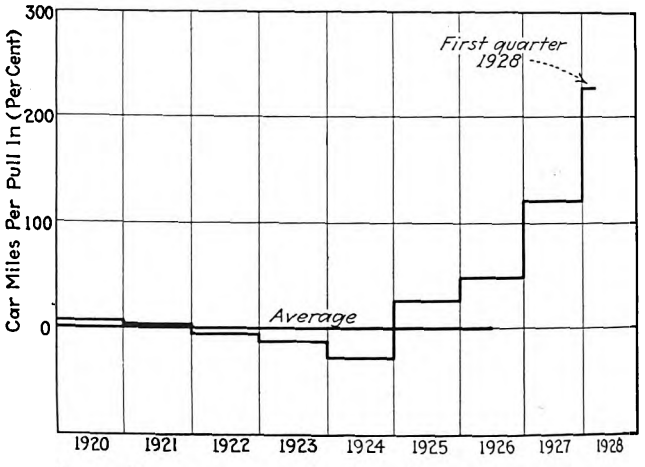

Fig. 5—Increase in car-miles per pull-in due to any cause

that when reinstated, these men were more permanent as a group than new men.

No great difficulty has been experienced in preparing regular trainmen for one-man operation. Of 111 men considered for transfer, five were rejected and 106 were given the test. One failed to pass the test and another

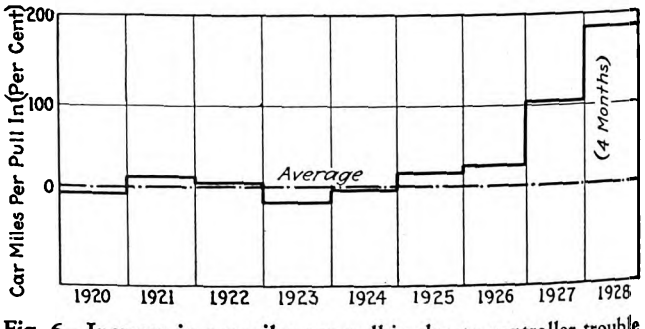

Fig. 6—Increase in car-miles per pull-in due to controller trouble

was recommended as a borderline case, so that of the 106, a total of 104 passed.

Another study concerned the major occupations of motormen before entering railway service, including those transferred to one-man operation. The results of the study are given in Table V.

Apparently the largest number of men are those who have had farm, mechanical, or automotive experience; a smaller number are those who have had sales or clerical experience. If the mechanics and automotive men are grouped together, they constitute the source from which 42.2 per cent of all Milwaukee motormen are drawn. This is contrary to the general opinion that the chief source of supply is from the farm. Of those discharged

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because of accidents, the farm group is the highest, outside of those classified as miscellaneous, whereas the sales and clerical groups are lower. From the disciplinary point of view, the garage and sales groups show the highest per cent discharged for reasons other than accidents, whereas the clerical is the lowest.

A study was made of car collisions from November, 1926, to June, 1927, inclusive. Fifty-four cases were studied, all being instances where it was definitely known that the car operator had been at fault. Of the 54 men who were observed, 46 had been given the motorman selection test. Sixteen of the tested men had been in service more than a year, and 50 per cent of these had failed on the motorman selection test. Of the 30 tested men in service less than a year, 20 per cent had likewise failed.

All these results show progress toward the accomplishment of every training objective. Were the results to be translated into terms of their monetary value to the company, there is little question but that they would constitute an attractive dividend on the investment in training work and equipment.

Accident Prevention Contest Is Close

AT THE end of eight months, no "probable winner" of the accident prevention contest of the Chicago Surface Lines could be named. Ten of the twelve participating divisions were staging a "neck-to-neck" race for premier honors, and the two lowest divisions were not far behind.

Points are awarded for the lowest number of fatal accidents to passengers and public, the lowest number of fatal accidents to trainmen and other employees, and for the elimination of all types of mishaps. Percentage values have been fixed for the purposes of the competition as follows:

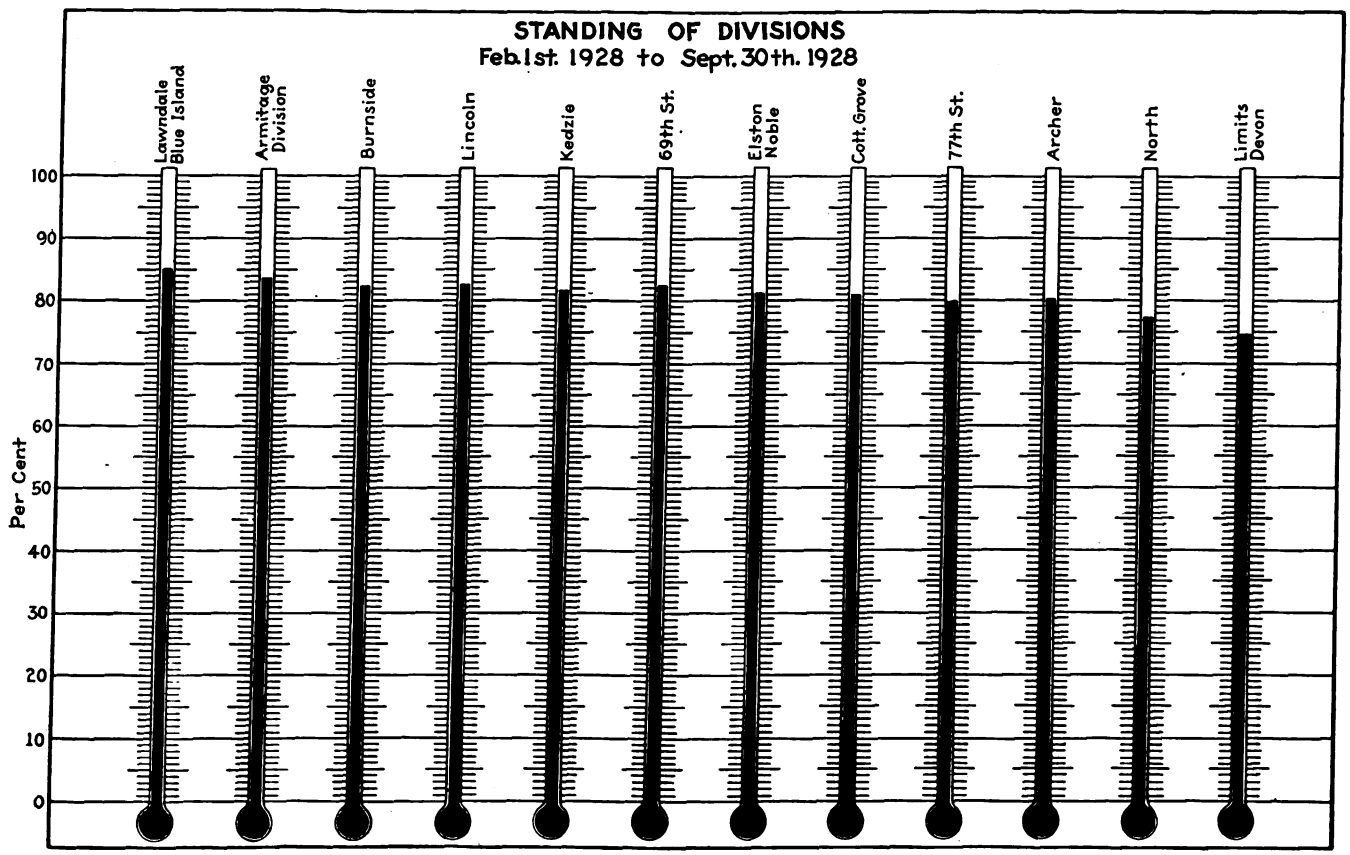
		Points
1.	Lowest number of fatal accidents and injuries to passengers and public	10
2.	Lowest number of fatal accidents and injuries to trainmen or other employees	5
3.	Alighting or boarding mishaps	20
4.	Collisions with vehicles	20
5.	Persons struck by car	5
6.	Collisions of cars	15
7.	Brushed off step (car in motion)	5
8.	Thrown in car by sudden start or stop	5
9.	Employee injured under duty	5
10.	Blind cases	10
	Total points	100

San Antonio Holds Treasure Hunt

THOUGH the San Antonio Public Service Company is a regular patron of the usual methods of advertising its gas, electric and street railway services, it occasionally adds special drives with definite objectives to its program. A most unusual drive to familiarize the public with the routing and general convenience and dependability of its street railway and bus service was carried on during 1927 by the company in conjunction with a local newspaper and a number of merchants. Particulars are given in the company's 1928 Coffin brief.

The drive took the form of a treasure hunt. It appealed to the imagination of all classes, and for many weeks created interest and enthusiasm. The participation of the newspaper brought many columns of first page news items of the progress of the contest, all of which were good publicity for the railway.

During the treasure hunt a full-page display advertisement was used daily, carrying the headline "Follow the



Standing at the end of eight months of the twelve divisions participating in the Chicago Surface Lines accident prevention contest

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Trolley to Treasure Land." Part of this page was devoted to detailed diagrams of some particular car line, showing the streets, cross streets and the scheduled time of cars at various points at one-minute intervals. The short time required to travel from the business district to various points in the residential district was emphasized in these diagrams.

Clues and general information were furnished in the daily page advertisements and were supplemented by a generous amount of reading matter. Following the clues, treasure hunters made a journey through the company's office and various street cars and found it necessary to visit the stores of merchants participating in the plan. Some made the hunt in automobiles, some walked, and others found it desirable to ride in street cars, but all were forced to familiarize themselves with the conveniences in the transportation system. As a typical example, one of the rules read as follows:

"Count the number of advertisements in a street car, multiply this by the number of turns made by the Army Post bus on its regular routing, add a certain number, and the total will give you the number of a street car that is now in operation on the North Flores line, carrying the treasure."

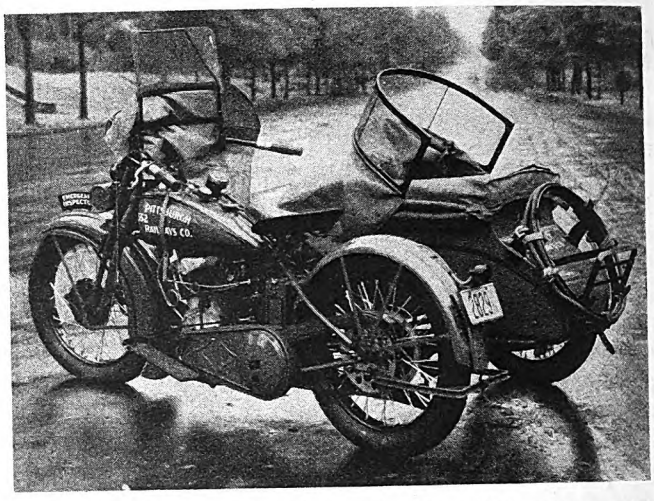
It is very interesting to note that in this instance, more than 50 people solved the problem, stopped the proper car, and searched it from roof to truck.

The weekly prize was $50 in cash, together with merchandise orders of equal value. It was necessary to solve each daily problem to locate the weekly prize. In turn it was necessary to solve and keep the solution to each weekly problem in order to compete for the grand prize given by the company, which was $500. In addition to this, merchandise orders amounting to $350 were included in the final prize.

Motorcycle Emergency Service Proves Effective

By R. C. Rearick
Chief Traffic Dispatcher Pittsburgh Railways, Pittsburgh, Pa.

STUDY of the delays to their system convinced the Pittsburgh Railways that the length of delay could, in a great many cases, be lessened materially if a means, more rapid than the regular emergency trucks, was used. Accordingly, on July 1, 1928, the company purchased six Harley-Davidson commercial type motorcycles with side cars to be used for street inspectors. These machines



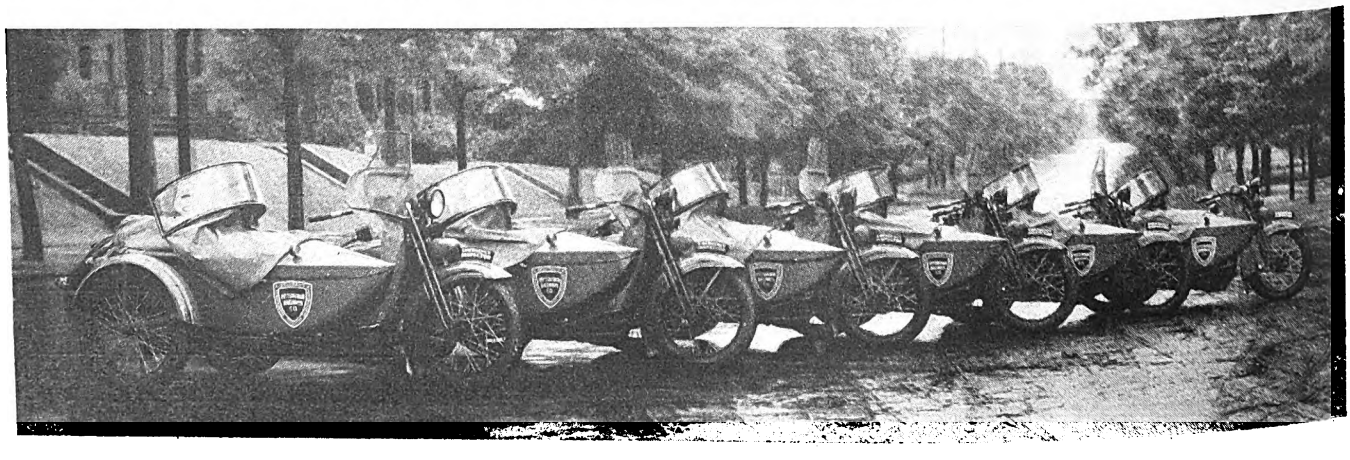
Commercial type motorcycles with heavy-duty motors were selected. Note the wire tow cable on the tire carrier

have a special heavy-duty motor with a maximum speed of 45 m.p.h., and are stationed at strategic points about the system. The regular passenger type of side car was selected instead of the commercial body, so that, if necessary or desirable, the inspector can take someone to help in caring for the emergency.

The side cars are arranged for the carrying of all necessary tools and supplies, such as wrenches, hammers, trolley wheels, fuses, coupler links and pins, tape, trolley rope, etc., for the making of emergency repairs to equipment. They also are equipped with a fire extinguisher, trolley wire pick-up, rubber gloves and first-aid kit. The tire carrier on the rear of the side car is utilized for carrying instead of a spare tire, 25 ft. of $\frac{5}{8}$-in. rope center wire cable with detachable hooks on each end, by means of which derailed cars can be pulled back on the rails or disabled vehicles removed from the track.

The motorcycles are in service eighteen hours per day, two men, working separate shifts, being assigned to each machine. The vehicles, when not in use, are kept in company garages convenient to the places at which they are stationed.

During the three months these machines have been in service, they have proven very satisfactory, providing a light, fast, inexpensive, auxiliary emergency service without the loss of the inspector to the street supervisory force. With these machines, it is possible to quickly dispatch an inspector to any part of the system in contrast to the older method under which the inspector was generally forced to use the street car and often arrived after the emergency had been cleared.



Six motorcycles with side cars are used in Pittsburgh for emergency service

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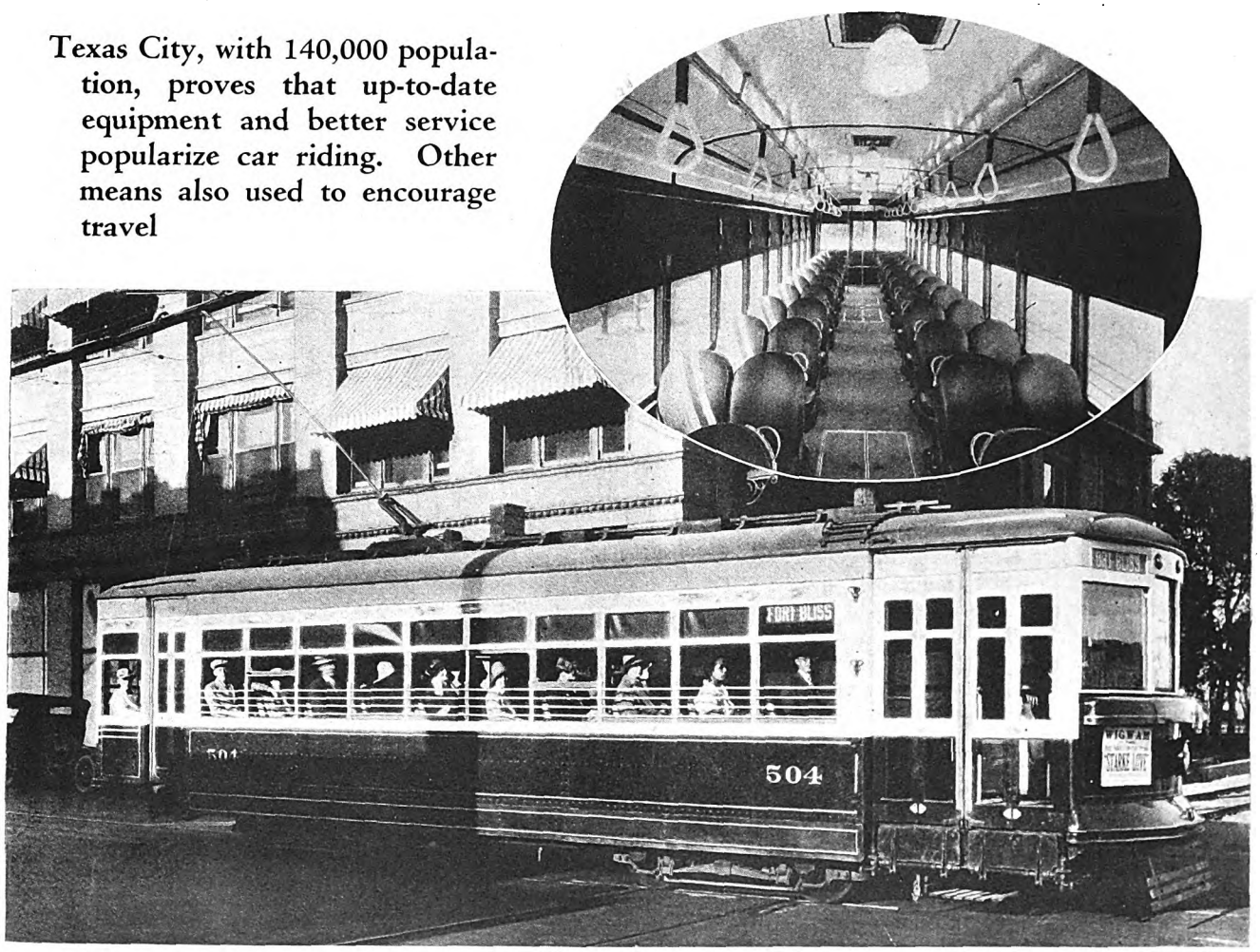
Modern Cars Build Traffic
in El Paso

Texas City, with 140,000 population, proves that up-to-date equipment and better service popularize car riding. Other means also used to encourage travel



These attractive cars are helping to increase car riding in El Paso

EL PASO ELECTRIC COMPANY, under the executive management of Stone & Webster, Inc., serves a combined population in El Paso, Tex., and Juarez, Mexico, of approximately 140,000, with a rolling stock equipment consisting of 80 passenger cars, four work cars and eleven buses. Last year the company added seven new street cars and rebuilt seven of its older cars and installed modern equipment. The higher acceleration and improved loading and unloading facilities of these cars have permitted an increase in the speed on the lines where they are being operated from 10.3 to 11.9 m.p.h. This has made possible the handling of as many passengers on a line with five cars as formerly were hauled with seven cars. The length of time the cars have been in operation has been so short that figures are not available as to the exact extent to which they have developed additional traffic, but it is obvious that the public is using them to a greater extent than formerly. The accompanying data relating to these cars are taken from the company's brief for the 1928 Coffin prize.

The new cars are of the double-truck, single-end, one-man, Birney safety type, with automatic treadle-operated rear-exit doors and double front-end doors for entrance and exit. Low floors with ramps to the doors speed up the loading and unloading of passengers. The doors and steps are of the folding type and of positive action. The door edges of the posts are equipped with folded strips of extra flexible leather in place of the customary rubber.

The new cars were equipped with individual type seats, spring cushions and upholstered in genuine brown leather. Each car can accommodate a seated load of 49 passengers. The floors are covered with rubber tiling, which makes an unusually neat and attractive appearance and presents a surface that is easily cleaned. It also deadens the noise in the car from the trucks. The window posts are narrow, and metal sash is employed to give the riders unhampered vision.

The interior of the cars is finished in mahogany with all metal fixtures nickel plated and all pipes in the front vestibule neatly boxed. The fare box is driven by an air motor and is nickel plated. The cars are equipped with sanitary hand straps.

The lighting units are shaded by glass bowls, mounted as an integral unit with the ventilators. They extend the

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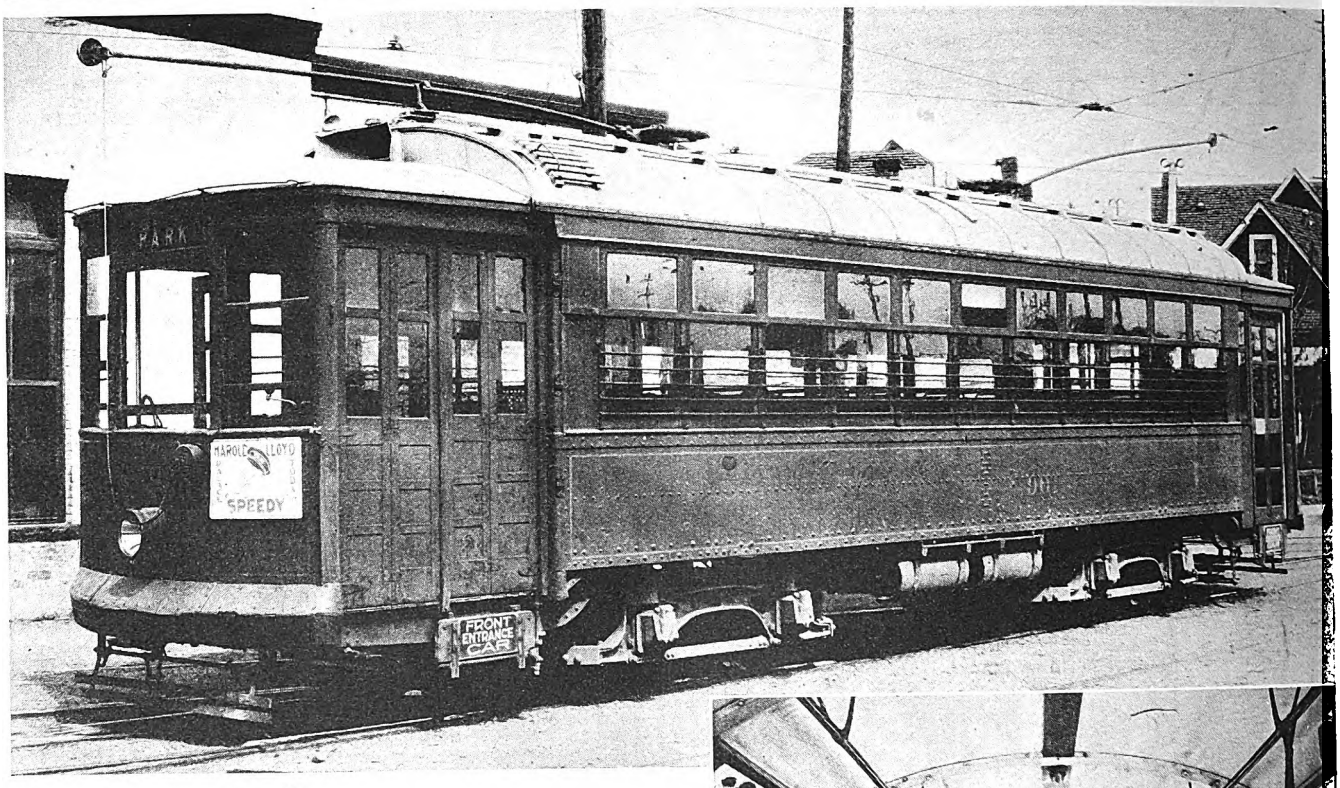

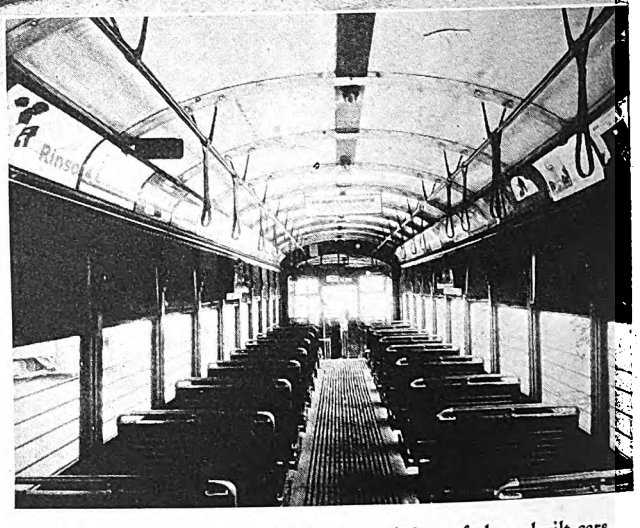

These views show the original condition of the rebuilt cars

length of the car in the center of the ceiling, which is of Haskelite finished in white enamel.

The exterior appearance of the car is enhanced by a hinged skirt, suspended from the sides of the car body, so that the noise of operation is deflected. A row of lights shielded by a cowl extending across the top of the front and rear dashboards greatly adds to the appearance of the cars at night.

The painting is carried out with a streamline effect, the colors extending in an unbroken line through the doors and around the ends of the car. The body is done in Cordovan red, the window posts and panels in white, and the panels just below the roof in blue. These color shades have been carefully blended and harmonized. As the cars operate on a line to the largest cavalry post on the Mexican border, the coloring is very much in keeping with the service rendered. The new cars were built by the American Car Company of St. Louis.

Novel Method of Introducing New Cars

The company adopted a novel method of introducing the new cars to the public. Following their arrival, all inspectors spent a full day at the carhouse familiarizing themselves with all operating details. Then two cars were taken out on the line. One, in charge of a regular operator and an inspector, was stationed on a siding across from the main office of the company, and suitable signs invited the public to make a thorough inspection. The second car was run on one of the principal lines in the downtown section, a short belt line, and the public was invited to take free rides. Both the car on the siding and that operated on the belt line were on display from 9 a.m. to 9 p.m. for three days. The plan was given wide publicity in the local newspapers, both in news columns and by regular use of advertising space.

Approximately 13,000 people took advantage of the opportunity to visit the car on the siding and ride on the one operated on the belt line during the three-day period. The result was that the new equipment became the talk of the town.

Besides adding these new cars, the company rebuilt seven of its older cars during 1927, as explained. Those selected were of the double-truck, double-end, four-motor type. Automatic treadle-operated rear-exit doors were installed with double front doors for entrance and exit. These doors are of the folding type with wireglass in the lower panels and clear plate in the upper panels. The doors were entirely new, and the door engines were placed overhead in the vestibule, inclosed in attractive cabinets.

The controller box was turned with its back to the side wall of the vestibule, so that the treadle door valve and the selector valve could be cared for without crowding. Another advantage of the change was that it placed the controller handle in a more natural position for use by the operator. The fare-box post, which formerly extended from the floor to the ceiling, was cut off even with the sill of the front vestibule window and moved forward. This allowed more room in the vestibule and removed an obstruction to the operator's vision. A dividing rail was placed in the vestibule between the entrance and exit doors, and another rail separates the passage to the treadle door. Hand brake wheels were discarded in favor of drop brake handles, which were considered to take up less space and to be more sightly.

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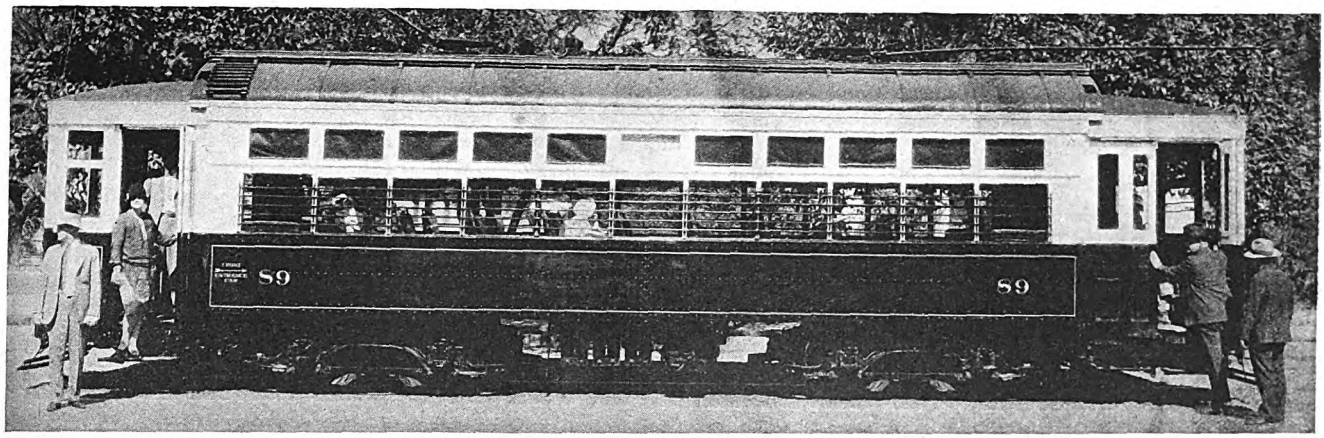

The way the cars looked after modernization

Each car roof was completely recovered with canvas and a new Haskelite ceiling was installed. The hand straps used and the lighting system are the same as in the new cars. The wooden slat seats, including the backs, in the old cars were upholstered with curled hair and covered with brown Spanish grain leather. The old flooring was replaced with new wooden floors overlaid with Celotex and covered by battleship linoleum. The steps from the vestibule into the car and the folding steps were equipped with Kass safety treads. The red, white and blue color scheme used in the new cars was followed in the rebuilt cars. The cost of remodeling these cars was approximately $2,500 each, exclusive of overhauling and replacement of old materials.

Better Service Slips

While these cars proved efficacious traffic builders, they have not been the only means followed for encouraging car riding. All employees are supplied pads of 50 slips, known as "Better Service Slips." Every time that a significant remark is heard about the company or about ways in which it could improve its service the employee records it on one of these slips. The slips are then sent to the manager and by him to the customers' service department. These slips help in three ways. Some good suggestions are received; they offer an index of the company's standing in the community, and they stimulate employees to render the best service of which they are capable.

Regular complaints received by mail are handled by the customers' service department, and in almost every case the reply is made by a personal call. This method has been found to be productive of the best results. If the matter will require some time to investigate, the complaint is acknowledged by mail with the explanation that the company appreciates the interest prompting it and that a report will be made later. Where the complaint is received by mail from a person well known to some official of the company, the reply sometimes takes the form of a telephone conversation instead of a call.

A unique practice was begun in 1925 and has since been continued of trainmen handing greeting cards to all customers on Christmas Day. Last Christmas a total of 20,000 such cards were distributed in this way. The public reaction was distinctly favorable. This practice was helped by the fact that every car carries the name of the operator in a conspicuous place on the fare box. Hence the operators are individually known to many patrons.

The company arranges to have various magazines treating public utility questions sent to the public library, Chamber of Commerce and elsewhere where they will be read, so that utility problems can better be understood.

An Information Booth

In San Jacinto Plaza, in the heart of the downtown district, an information booth has been erected for the benefit of those who want to be informed about the company's railway and bus service. Maps showing the routing of all cars and buses, as well as the block numbers on various streets, are distributed free. The attendants in charge also are prepared to supply information on steam railroad schedules, sport events, amusements, fire alarm calls, and other information of general public interest.

The buses, both in city and interurban service carry unique courtesy signs lettered across the rear end: "Toot Your Horn and This Bus Will Gladly Move Over."

When the company decided some time ago to paint its cars a different color the choice of color was taken up with the City Planning Commission. This act received the unqualified indorsement of the commission, which made suggestions as to the color schemes.

Campaign Against the "Pick-Up" Evil

El Paso is one of the best paved cities in Texas and contains a private automobile for every seven inhabitants. At one time it was customary for many automobile owners, on their trip to town or return, to invite friends and even strangers to ride with them in their cars. The result was a loss of patronage by the railway. The latter published advertisements discouraging the practice, but it continued. Finally, the company decided upon a personal campaign.

Now, when a car operator notices that a private auto-

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mobile owner is habitually picking up his passengers, he takes the license number of the car and turns it over to the superintendent. The automobile owner is then interviewed by some company official, supervisor or operator who knows him. The general line of argument in all such cases is that a local business man has no more right to take away prospective railway passengers than a company would have deliberately to set out to injure the business of a local merchant. The point is also made that this practice makes it much more difficult for the company to maintain its service and pay dividends to its stockholders and wages to its employees, and that a good street railway service is an asset to every city.

This booth is maintained in downtown El Paso for the dissemination of information on car and bus schedules and other data desired by the public

The company had very little difficulty in making those to whom this argument was presented see its logic. In practically all cases promises were secured from them to refrain in the future from offering free rides to prospective railway patrons, waiting on the streets for a car.

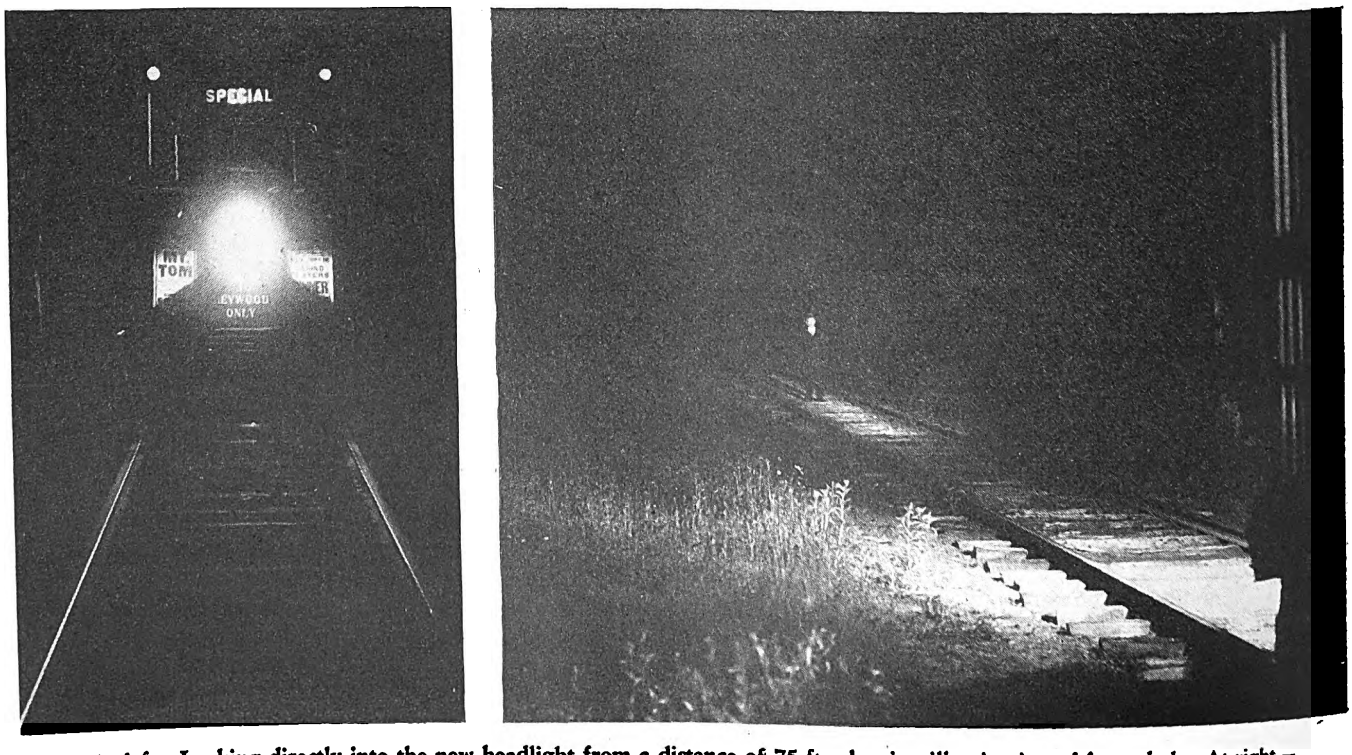
Holyoke Street Railway Develops New Headlight

IMPRESSED with the necessity for the frequent need for dimmers with the more powerful headlights now in use, G. E. Pellissier, assistant general manager Holyoke Street Railway, Holyoke, Mass., has developed a lamp which, while illuminating the track and highway ahead, also floodlights the outlines of the front end of the car to which it is attached and does not have to be dimmed under any circumstances. Mr. Pellissier found in his experience that in a number of instances where accidents occurred after nightfall complaints were made that the glare of the headlights was responsible, and that even where dimmers were used the sudden transition from very bright light to comparative dimness was confusing alike to motorman and automobile drivers.

The new headlight has a non-glaring pick-up of from 300 to 500 ft., and illuminates not only the space out ahead of the car but the front of the car itself and from 25 to 30 ft. each side of it. With the front end of an approaching car floodlighted in this maner there is little chance for an autoist or pedestrian to confuse it with any other kind of vehicle. The headlight is simple in design, involves no expensive apparatus and requires no dimming arrangement of any kind. Experiments are now being made with lamp bulbs which, if satisfactory, will eliminate the headlight resistances.

While the new headlight is not in production as yet, it is in the hands of the Crouse-Hinds Company and the Ohio Brass Company for further development.

Besides installing the new headlights the Holyoke Street Railway is equipping all of its cars with Person's 5-in. amber reflectors, for use as markers. It has been found that these reflectors indicate very clearly the outline of the car when the newly-designed headlight is used and that where the power is off the reflectors are equally effective in catching the reflections from the headlights of approaching automobiles.



At left—Looking directly into the new headlight from a distance of 75 ft., showing illumination of front dash. At right—View taken from the side of the car at night, showing pick-up of new headlight

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Transportation in Japanese Cities

By S. Kanaya
Chief, Section of General Affairs Electric Bureau of Tokyo,
Tokyo, Japan

The Tokyo railroad station, served by both buses and street cars

JUST as in the cities in America or Europe, a horse car line appeared as the first means of mass transportation in the communities of Japan. This line, however, was destined to be superseded within a comparatively short time by an electric surface car line.

The first regular electric road was built and operated by a private company in Kyoto in 1896, and within the next ten years the principal cities, such as Tokyo, Osaka, Nagoya, Kobé, and Yokohama, had successively installed their own systems. With the exception of the Osaka Railway, which always has been under municipal control, all these systems were built and operated by private companies. It was not until 1911 that these private electric roads began to be purchased by the municipalities concerned.

Owing to the increase in traffic from year to year, it was apparent that some kind of subsidiary service would have to be provided in some of the larger cities, in conjunction with the street railways. Tokyo was first driven to this need and the Tokyo Motorbus Company was incorporated in 1917, and began its regular service on the main streets of the capital city.

The disastrous earthquake and great fire of 1923 had destroyed the street railway system of Tokyo. To meet the deficiency of transportation caused by the calamity, the city of Tokyo installed a motorbus service in 1924, which, having been improved and extended, is still in use.

Recently bus service under private or municipal control was inaugurated in most of the larger cities, such as Osaka, Kobé, Nagoya, and Yokohama. However, the extension of this service in these cities, except Osaka, is still limited and conservative.

The cities of Tokyo and Osaka have been authorized to construct municipal rapid transit systems and are now engaged in the preliminary construction work. There is also the Tokyo Underground Railway, which acquired a franchise for an independent line about 10 miles long. A part of this line has been constructed and was opened to the public in December, 1927.

Transit Conditions in Tokyo

In 1882 the first horse car line was established by a private company in Tokyo. Before that time, there had not existed any means of public conveyance. Consequently, the success of this undertaking was great despite the poor condition of service.

In 1891 the National Industrial Exhibition was held in Tokyo, where the first experimental electric car was operated with success, and in 1904 the last horse car lines then existing were electrified. Two other street railways were installed a few years later and eventually were amalgamated with the original tramway, thus forming the Tokyo Tramway Company.

In 1911 the city purchased from the Tokyo Tramway Company all the existing lines of electric surface cars in the city and began operation under management of the Electric Bureau. At that time there was about 119.5 miles of track operated, with 1,514 cars owned; the average number of daily passengers carried amounting to about 534,400, with a revenue of 18,500 yen a day.

After having purchased the company's lines the Bureau extended several of them and constructed new lines, thus improving the equipment and service. There are now 197 miles of track operated with 1,598 cars owned. The average number of daily passengers carried is 1,200,000, with a passenger-revenue of 80,000 yen a day.

The total passengers in 1924 amounted to about 490,000,000, being the largest number of passengers ever carried by the electric tramways of the city. A marked decline in passenger traffic began to manifest itself in the subsequent years, which was due principally to the

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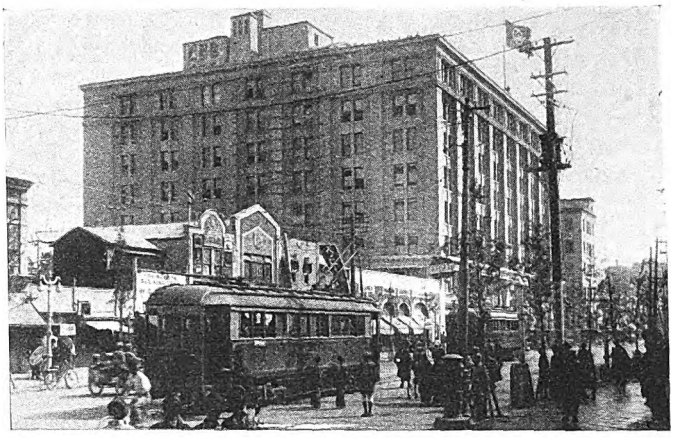

At left—The Matsuya department store in the shopping district of Tokyo. At right—Buses and street cars run on this street in the business district of Tokyo. The First Mutual Life Insurance Building is shown in the background

rapid development of the suburban districts. Probably more than 500,000 persons then residing in the city area moved out into the suburbs, thus decreasing the patronage of street cars, the service being generally limited within the city proper. The total passengers carried by each type of conveyances in Greater Tokyo are as indicated by an accompanying table.

There are two independent bus systems in Tokyo City; the municipal service, with 60 route-miles and owning 379 buses; and the Tokyo Motorbus Company, with 25 route-miles and 284 buses.

There is also an electric railway line of the Imperial Government Railway, which runs around the city limits and partly through the downtown district on the elevated structures and is practically a rapid transit railway. This comprises 59.7 route-miles, with 300 motor cars and 403 trailers. In 1927 the total passengers carried by this railway line amounted to about 290,000,000.

As was said in a preceding paragraph, a part of the Tokyo Underground Railways line (about 1.5 miles) was opened to the public at the end of 1927. The average number of passengers carried daily is about 25,000.

The municipal rapid transit railway comprises four authorized routes of about 42 miles, and will cost approximately 187,000,000 yen. The preliminary work for construction is now being carried on by the Electric Bureau of Tokyo City. It is probable that a part of this municipal rapid transit railway will be constructed in the near future.

Traffic Situation in Other Cities

Considering population within the city limits only, Osaka is larger than Tokyo. However, from the point of view of transit, Osaka is inferior to Tokyo.

Modern cars serve the business section of Tokyo around the Yusen and Marunouchi Building

As indicated by the accompanying table, the number of passengers carried by the Osaka municipal electric tramway has shown only a slight increase in the last few years. This was due to the rapid development of buses and taxis in the city. There are at present two motor bus systems. One is the municipal motor bus service, which operates about 80 buses. The other is a private company, with 270 buses owned. There are also about 2,500 taxis in service.

In other cities, namely, Kyoto, Nagoya, Kobé and Yokohama the urban transportation is still under complete control of electric tramways operated by the municipalities. The transit conditions in these cities are as indicated by the tables on page 841. Tokyo is omitted from these tables because the principal data are given on this page.

TRAFFIC FIGURES IN GREATER TOKYO

Year Ending March 31	Population, 1,000	Rides per Inhabitant	Number of Passengers Carried, Millions — Total	*Tramways	Electric Railway Line, I.G.R.	‡Motor Bus	†Suburban Electric Railway
1919	3,206	157	504	395	59	6	44
1920	3,309	163	540	401	79	8	52
1921	3,451	182	624	448	107	9	60
1922	3,558	195	695	479	128	12	76
1923	3,052	216	660	385	164	16	95
1924	3,480	243	844	482	188	34	140
1925	3,580	242	865	461	208	41	155
1926	3,708	240	888	435	243	42	168
1927	3,837	244	935	433	275	47	180

*Excluding passengers carried by a special line of Tokyo Municipal Tramway which serves the suburban district.
‡Passengers carried by the municipal and private motor buses.
†Including passengers carried by the Tokyo Municipal Tramway Suburban line.

While Kyoto operated approximately the same number of route-miles in 1927 as in 1919, the number of car-miles operated has increased during that period from less than 7,000,000 to almost 10,000,000. Passenger traffic has almost doubled in the nine-year period and the revenue in 1927 showed an increase of more than $3,000,000 since 1919.

Nagoya, Kobé and Yokohama have extended their route mileage from year to year, Kobé having almost trebled the 1919 mileage. Passenger traffic and revenue have also substantially increased from year to year, as shown by the accompanying tables.

With the rapid development of motor buses in Tokyo and Osaka, the control by the electric tramways of the urban transportation in these cities seems to be coming to an end. But it is incredible that the electric tramways in these cities will be superseded eventually by buses. On the contrary, it is quite certain that the time will

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OPERATING RESULTS OF JAPANESE MUNICIPAL TRAMWAYS

These tables are all for the year ending March 31. The fare in each case is 6 sen (3 cents), with privilege of free transfer, except in Kobé, where the fare is 5 sen (2½ cents), with privilege of free transfer.

OSAKA

Year	Route-Miles Operated	Car-Miles Operated	Passengers Carried	Passenger Revenue, Y.
1919	38.24	17,878,989	216,539,684	6,962,047
1920	39.25	20,942,358	262,162,367	8,443,798
1921	41.91	22,679,219	254,375,500	12,441,350
1922	45.47	24,887,246	267,092,806	15,224,280
1923	60.62	28,116,375	285,632,624	16,245,499
1924	51.81	30,257,108	301,255,979	17,118,043
1925	53.46	32,102,272	300,293,266	17,043,773
1926	54.21	33,385,879	304,643,900	17,270,448
1927	55.19	34,324,294	309,136,891	17,530,240

KYOTO

Year	Route-Miles Operated	Car-Miles Operated	Passengers Carried	Passenger Revenue, Y.
1919	29.50	6,694,260	55,673,234	2,140,018
1920	29.50	6,843,921	69,856,963	2,710,541
1921	29.50	7,677,180	72,538,684	3,886,470
1922	29.50	7,824,871	77,814,948	4,600,033
1923	29.50	8,626,764	84,148,160	4,893,767
1924	30.60	9,004,262	88,957,436	5,156,091
1925	30.50	9,390,994	92,295,912	5,340,438
1926	30.50	9,780,053	93,162,747	5,388,439
1927	28.74	9,858,380	97,082,375	5,597,795

NAGOYA

Year	Route-Miles Operated	Car-Miles Operated	Passengers Carried	Passenger Revenue, Y.
1919	23.50	4,960,589	39,893,941	1,345,994
1920	25.69	5,402,105	52,228,569	1,733,634
1921	25.69	5,420,369	58,501,336	2,091,888
1922	25.69	5,965,724	70,860,057	2,555,801
1923	28.09	4,377,838	52,643,078	2,038,972
1924	29.52	7,180,611	85,944,341	3,303,282
1925	30.17	8,543,872	91,539,902	3,511,965
1926	30.18	8,620,702	94,828,207	3,638,789
1927	31.14	8,897,885	99,090,368	3,814,560

KOBÉ

Year	Route-Miles Operated	Car-Miles Operated	Passengers Carried	Passenger, Revenue, Y.
1919	7.62	2,441,207	51,284,411	1,499,330
1920	8.04	2,705,593	52,386,816	1,872,107
1921	8.06	3,445,671	57,314,414	2,805,173
1922	11.00	4,805,772	64,108,981	3,140,305
1923	12.26	6,127,385	73,791,111	3,635,411
1924	13.34	6,684,130	80,679,672	3,973,738
1925	15.28	7,480,824	87,376,615	4,301,364
1926	17.00	9,130,047	91,243,582	4,490,350
1927	18.19	11,316,400	101,681,548	5,005,578

YOKOHAMA

Year	Route-Miles Operated	Car-Miles Operated	Passengers Carried	Passenger Revenue, Y.
1919	11.90	3,255,295	30,065,105	1,123,799
1920	11.90	3,277,923	37,848,132	1,433,330
1921	11.90	3,678,095	47,565,086	1,811,302
1922	11.90	4,363,295	41,545,601	2,423,136
1923	11.90	5,006,174	47,873,018	2,779,246
1924	11.90	3,669,119	40,623,428	2,333,756
1925	13.00	4,805,786	48,903,884	2,830,682
1926	15.40	4,959,639	47,553,374	2,735,741
1927	16.72	4,879,931	48,033,691	2,759,620

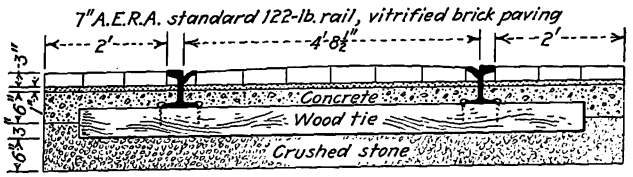
never come when the electric tramways will be deprived of the important rôle which they are now playing on the stage of urban transportation.

Needless to say, the provision of a municipal rapid transit railway in Tokyo and Osaka, having a population of more than 200,000, is a pressing affair. The municipalities concerned realize this condition and are now planning to build a municipal rapid transit system at the earliest date possible.

Extensive Track Renewal Program in Richmond

PROCEEDING through the heaviest part of a major track renewal program on some of the most congested traffic streets in the capital city of Virginia, the Virginia Electric & Power Company, Richmond, Va., holds the enviable record of never having delayed a single car or having a single accident. Although compelled to wait on a delayed city street program, the track crews have already completed three major jobs.

At present work is being rushed on a 24-hour basis on Seventh Street, from Canal to Marshall Streets. This project involves 3,000 ft. of double track on a maximum grade of 5.5 per cent, with the construction crossing five main arteries of traffic. Standard 122-lb., 7-in. girder rail is being used on 7-in. x 8-in. x 8-ft. white oak ties. These are being laid on 6 in. of 1-in. crushed granite. The ties are covered and partially surrounded with a 6-in. layer of concrete. The job is completed with 3-in., vertical fiber, wire-cut brick paving on a 1-in. plain sand cushion.



Standard type of track construction for paved streets, being used in the extensive program of the Virginia Electric & Power Company

Another feature of this work, which got under way Aug. 20, and which is set for completion about Nov. 20, is the use of approximately $6,000 worth of new pneumatic machinery. To insure adequate working conditions for a 24-hour day, the entire job is brilliantly lighted. The next major job to be undertaken is that of reconstructing 4,000 ft. of double track on Main Street from Fifth to Laurel Streets. The same type of construction will be used with the exception that Cary-Elastic rail filler will be used to reduce noise, as this portion of Main Street is semi-residential.

The total expenditure on these jobs will be approximately $140,000. There have been no serious car delays on this project, and according to F. C. Womack, engineer of maintenance-of-way, this record has been maintained during the past five years.

Track construction in progress in Richmond. Note the sign at the right, reminding the public that a million fares are being spent to improve the service

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Railway Electrical Engineers Convene

COMMITTEE reports and ensuing discussion at the Nineteenth Annual Convention of the Association of Railway Electrical Engineers, held at Chicago from Oct. 23 to 26, revealed a steadily increasing number of applications of electrical energy to steam railroad requirements. Of the nine reports presented at the convention five were especially conspicuous for the scope and importance of their contents, among them being reports on train lighting, power plants, motors and control, illumination, and locomotive electrical equipment.

The report of the committee on train lighting received much discussion, particularly the section devoted to electric refrigeration for dining cars. Other subjects touched upon in this report included the lighting of parked Pullman cars, fabric faced pulleys, locomotive lighting and the standardization of illumination for rail motor cars. The committee on power included in its report the subjects of combustion and furnace design, stokers, piping, prime movers, purchased power and power contracts. With regard to purchased power and power contracts the committee furnished information concerning methods of keeping cost records and recommended a special form for power records. The subject of motors and control was divided into three parts, each being handled by a sub-committee. One covered the application of motors to various types of machines; another prepared instructions for the maintenance and test of motors, and the third presented specifications for the purchase of electric motors and a form to be used in ordering motors.

The work of the committee on locomotive electrical equipment was prepared by two sub-committees, one furnishing a tentative specification for locomotive wire, and the other treating the subject of cost accounting related to inspection and maintenance of automatic train control equipment. The committee on illumination devoted its report to the development of lamps for train and locomotive service, lamps for special purposes and floodlighting for railroads. The lamp demand tables were brought up to date. The remaining four reports, those on the manual of recommended practices, radio application, electric heating and welding, and self-propelled vehicles, while much shorter than the others, were productive of valuable discussion.

An interesting and important part of the convention was the display of electrical equipment by 67 member companies of the Railway Electrical Supply Manufacturers' Association. The registration of engineers who attended the convention and exhibit exceeded the 360 mark for the four days.

American Standards Association Now a Reality

UNANIMOUS approval by the 37 member bodies now provides for the establishment of the American Standards Association to succeed the American Engineering Standards Committee. It is felt that a more widespread participation by trade associations towards national industrial standardization will result from the abandonment of the committee form of organization previously used.

One of the first acts of the new association will be the organization of a board of directors composed of twelve industrial executives. This newly created board will control the general administration and policies of the association. The old committee made up of representatives of all the member bodies now becomes the standards counsel and in its hands will rest matters connected with the adoption and approval of national standards.

The officers of the association are: W. J. Serrill, president; Cloyd Chapman, vice-president; P. G. Agnew, secretary; F. J. Schlink, assistant secretary.

Spring Switches Used on South Shore Line

HIGH-SPEED spring switches of the No. 20 type were installed for the new siding of the Chicago, South Shore & South Bend Railroad at Tamarack, Ind., recently opened to traffic. Many railway engineers have contended that spring switches were not suitable for high-speed operation, but the South Shore engineers have worked on the theory that the switch points can be protected satisfactorily by automatic signals.

In 1926 the South Shore engineers installed turnouts of the spring type at some of the least traveled portions of the line. No. 16 switches were used. Operation of these switches has been satisfactory. The signals are set to show red if there is as much as $\frac{1}{8}$-in. opening in the switch point. When the new Tamarack siding was tested out experimental trains were run through the switches at a speed of 60 m.p.h. Tests of the signal protection at the points also showed that the slightest separation of the points caused an immediate danger signal to show on the target. At present the motormen are limited to 45 m.p.h. through turnouts.

Electric Railway Joins France and Spain

DIRECT railroad connections between France and Spain across the Pyrenees Mountains, which separate these two countries, has been an active subject of discussion for many years. Now one line has been completed and two others are under way. Up to this time rail transportation between the two countries was limited to lines along the coast, either on the Mediterranean or the Atlantic Ocean side. The new line considerably reduces the distance and running time between many important cities in France and Spain.

The longest tunnel on the route is 7,822 m., or about 4.9 miles in length. It is at an altitude of 4,000 ft. above the sea, and about 2,500 ft. below the peak of the highest mountain above it. One end of the tunnel is in France and the other in Spain.

Railway operation on the French side to the International Railway station on the south side of the tunnel is conducted by the Midi Railway, which already has equipped a number of sections of its line with electric power. The same system used by it has been adopted for this international line, namely, 1,500-volt direct current with catenary construction. The locomotives used on the line are of the BB type with all four axles motor driven. The locomotives have a continuous power output of 1,000 hp. and a one-hour output of 1,400 hp. The maximum speed of the passenger locomotives is 75 km. (47 miles) per hour. On sections with the steepest grades, two locomotives are required to haul the trains. Hydro-electric power is used and is transmitted three phase. The particulars given were obtained from *Le Génie Civil.*

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Personal Items

George B. Avery to Run Seattle Road

Complete charge of the Seattle Municipal Railway, Seattle, Wash., is to be placed in the hands of George B. Avery, superintendent of public utilities, until the proposed reorganization program for the department can be perfected. Announcement of this effect was made by Mayor Frank Edwards, following the death on Oct. 27 of David W. Henderson, for years general superintendent of the system. The plan is understood to contemplate the immediate curtailment of expenses of the railway department, starting with a saving of $500 a month in salary for a separate superintendent of the department. It has the backing of the City Council at large, although there is some opposition.

As superintendent of the city's utilities Mr. Avery has supervision over the light, the water and the railway departments, as well as over the service of privately-owned utilities operating under franchise in the city. The appointment of a successor to Mr. Henderson is not contemplated at present, but divisional heads in the department will be directly under Mr. Avery. This plan was evolved during the time Mr. Henderson was ill, and appears to have grown into an accepted policy when it became evident that he would not return to the department.

J. N. Shannahan Heads Advisory Council

Former president of American Association and official of Omaha & Council Bluffs Street Railway chosen to succeed B. C. Cobb as chairman of body that guides policy of industry

NO MORE fitting appointment could have been made than that of John N. Shannahan, president of the Omaha & Council Bluffs Street Railway, Omaha, Neb., to the post of chairman of the Advisory Council of the American Electric Railway Association to succeed B. C. Cobb, for it was during Mr. Shannahan's administration as president of the association that the Advisory Council came into being as the successor to the committee of 100, formed during the war time.

J. N. Shannahan

It is at his own expressed desire that Mr. Cobb is retiring as head of the council. As was made plain at the time of the formation last spring of the Allied Power & Light Company to bring together the Hodenpyl-Hardy and the Stevens & Wood interests, Mr. Cobb has been gradually relinquishing the more arduous of his affiliations and when he expressed the wish to be relieved of the responsibility which he had carried since the formation of the Advisory Council, a committee was appointed consisting of R. P. Stevens, former president of the American Association and head of the Allied Power & Light Corporation; C. E. Grossbeck of the Electric Bond & Share Company, and J. J. O'Brien, president of H. M. Byllesby & Company, to co-operate with President Barnes in choosing a successor to Mr. Cobb. The members selected Mr. Shannahan, and secured his consent to serve.

Entirely aside from the element of recognition by the industry of the part that Mr. Shannahan has played in the past as a member of important committees of the American Association, as an officer of that association and finally in 1924 as its president in helping to shape the destiny of the local transportation industry, Mr. Shannahan's appointment puts into the post of chairman an executive who helped not only to formulate the fundamental principles proclaimed by the Advisory Council some time ago, but a man who has made a fetish of every pronouncement set down by the committee as an obligation of companies engaged in furnishing local transportation. He has been in Omaha just about a year, yet in that short time he has installed no end of innovations and has just seen his work substantially recognized by a vote of confidence at the polls which carries with it a new franchise to his company for a period of 30 years. His work there may be said only to have just begun.

True, Mr. Shannahan has won over the public of Omaha to his company by a series of well-timed service and other changes in their interest, but work on the bigger program which he has in mind necessarily had to wait on the settlement of the franchise matter. As the vote just recorded in Omaha indicates, it pleased more than three persons out of four when Mr. Shannahan said some time ago about the new grant that "when I accept the franchise, I marry it; I accept it for better or for worse." People knew that he meant what he said, for his record was there to prove it, the record of a year of most strenuous work, some of the high spots of which were only hinted in the review in the JOURNAL of Oct. 13, page 695.

Mr. Shannahan's is a career around which a notable biography could well be written for popular consumption, but the record of his previous accomplishments has been covered before in the pages of the JOURNAL, notably in the issue of the daily published during the sessions of the American Association at Atlantic City in October, 1924, at which he was elected president of the association, and in the JOURNAL at the time of his accession to the post at Omaha which he now fills. It suffices to reiterate the statement that the avowed purpose of the Advisory Council is to interest owners of large properties more directly in the welfare of the industry generally, and to get the benefit of their advice and counsel at meetings held regularly, and then have the suggestions so evolved carried out through L. S. Storrs, the managing director. Probably no other man in the industry is better qualified than is Mr. Shannahan for this work and for the task of aiding the members of the council as their directing head in formulating plans for meeting such problems of the industry as the restoration of the credit of the railways, securing co-ordination of railway and bus service, effecting the modernization of properties and carrying through other outstanding tasks.

As indicated before, both at Omaha and in his other official capacities, Mr. Shannahan has applied all the principles that the Advisory Council has laid down as essential to successful local transportation because he has first secured from the public that measure of recognition of the rights of the railway upon which all accomplishments of a permanent character necessarily are presaged. In short, the record of his work is Mr. Shannahan's own best eulogy.

OBITUARY

David S. Carll, vice-president of the Capital Traction Company, Washington, D. C., and the engineer who was in charge of the installation in 1897 and 1898 of electric lines of that company practically as they stand today, died at his home in that city Nov. 5. Mr. Carll went to Washington from Kansas City in 1890 at the time the lines of the old Washington & Georgetown Railway were being converted from horse to cable. He was chief engineer and superintendent, and held that position when the Capital Traction Company was organized in 1895 and took over the properties of the Washington & Georgetown. He had been an officer of the company since that time and a vice-president for about twenty years. Mr. Carll was born in 1855.

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Large Orders Ahead for Heavy Electric Equipment

New York to ask bids on 300 subway cars. Pennsylvania Railroad asks bids on electrification. South Shore orders ten cars. Track projects in Washington, D. C.

NEW YORK City Board of Transportation announced today that it will soon advertise for bids for the construction of 300 steel cars for service on the Eighth Avenue-Central Park West-Washington Heights line of the new subway system. Initial operation will probably be started early in 1930 from the Harlem River terminal at 207th Street as far south as Chambers Street, which will be a temporary terminal pending the completion of the East River tubes under Fulton Street to Brooklyn.

For nearly a year, the members of the board and its engineers have been consulting and conducting research on the design of a steel car. As a result it is expected that the cars of the city's new subway system will afford greater capacity and facility, will be faster in operation and have less crowding for the amount of traffic anticipated than other cars now in use in the city.

The new cars, as designed, will be 60 ft. 6 in. long, 10 ft. wide and 12 ft. high. The length will be 9 ft. and 2 in. longer than the Interborough Rapid Transit Company cars and about 7 ft. shorter than the single steel cars now used by the Brooklyn-Manhattan Transit company. They will permit easy movement of passengers through the end doors between cars, while the train is in motion.

The width and height of the new cars will be the same as the width and height of the Brooklyn-Manhattan Transit company cars. The new cars will have four double doors on each side, each doorway being 3 ft. 10 in. wide.

For initial operation, local trains will terminate temporarily at 168th Street and Broadway, while the expresses will go to 207th Street. The speed of the local service will be about the same as the present I. R. T. service, but the express trains between 207th Street and 42nd Street will be about three minutes faster than the I. R. T. expresses under the present schedule of service.

In order to determine structural clearances and demonstrate the arrangement of car body parts, the Board of Transportation for some time past has been working on a model section of a typical car in the office of the board's bureau of equipment and operation at No. 49 Lafayette Street, as shown in the accompanying photographs.

The arrangement of the seats is somewhat similar to the arrangement now in existence in the B.-M. T. cars, but in the city's new subway cars there is to be 2 in. more knee room between cross-seats than in the B.-M. T. cars. Each car will seat 60 passengers, and when filled with a standing load, each car will have a capacity of 282 passengers. The station platforms are 660 ft. in length, enough to accommodate a train of eleven cars, nearly 30 per cent more than the longest B.-M. T. train and 55 per cent more than the present Interborough trains of ten cars each.

The cars will be provided with white-enameled hand straps in front of the seats and vertical stanchions near the doors. The seats will be of heavy, natural-colored rattan.

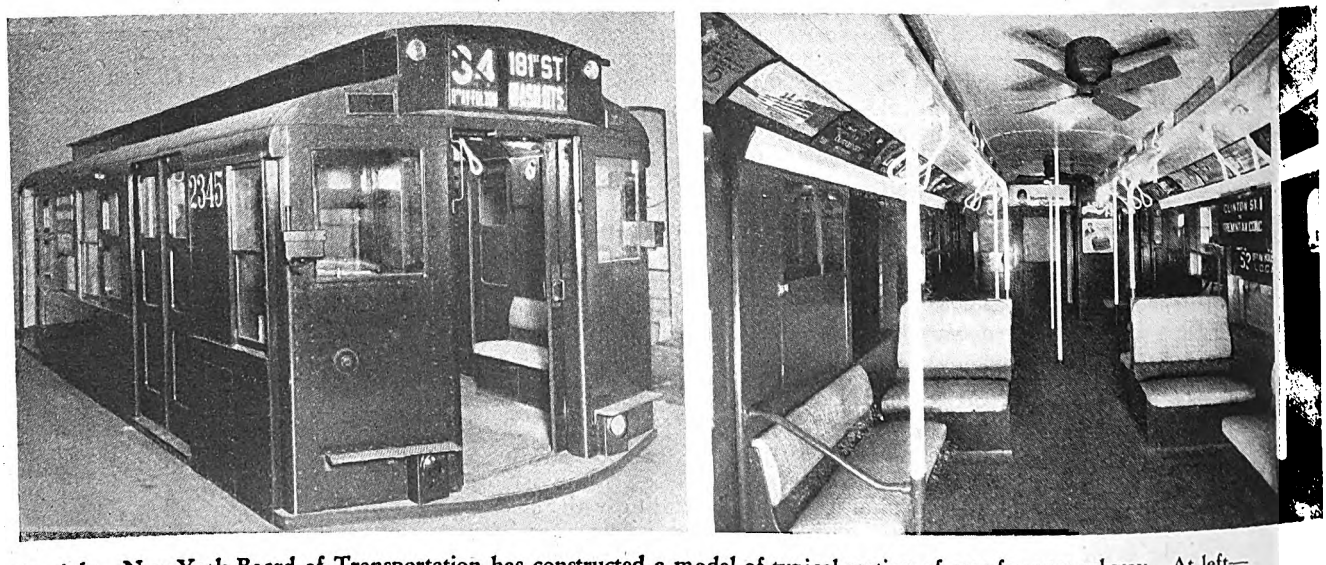
Illuminated route or destination signs will be installed on the sides and at both ends of cars. These signs will carry a designated route number indicating the particular line the train is operating over—similar to route numbers now in use on some of the bus lines.

Each car will be equipped with five ceiling fans. The equipment of each car such as doors, fans, lights, etc., will be connected to permit operation from one or more positions between cars on the train.

Pennsylvania Railroad Asks Bids for Electrification

Bids have been asked by the Pennsylvania Railroad, Philadelphia, Pa., for the electrification of its lines between Philadelphia and Trenton as the first section to be electrified under the $100,000,000 electrification program. Money has already been appropriated by directors to cover cost of electrification between Philadelphia and Trenton.

The second step will be electrification of the line from New York to New Brunswick. This line is already electrified from Newark to New York, although some modifications may be necessary in connection with the whole electrification program. The third step will be the tying together of New Brunswick and Trenton, which will permit of



At right—New York Board of Transportation has constructed a model of typical section of cars for new subway. At left—Interior view of section of new subway cars for New York

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operation of through electric trains from New York to Philadelphia. Many details remain to be developed, and it is yet to be determined whether electrification of the whole road, freight as well as passenger, will be next pushed to Wilmington or whether electrification of the main line to Atglen will be taken up after the Philadelphia to New York stretch is completed.

The line between Philadelphia and Wilmington is at present electrified for local passenger service only. Electrification of the road between Philadelphia and West Chester has almost been completed for local passenger business and will be opened for service shortly.

South Shore Orders Ten Cars

An order for ten more steel passenger cars, five motors and five trailers, has been placed by the Chicago, South Shore & South Bend Railroad, Michigan City, Ind., with the Standard Steel Car Company, Hammond, Ind.

Ten motor cars are under construction by the same concern now, to be delivered toward the end of the year. The new order brings the total of cars to be put in service during the next half year to twenty.

Specifications of both orders call for little change in the latest model of South Shore Line car. Individual easy seats of the bucket type, Pullman smoking compartments, wide aisles, large windows, "turtle-back" roof with raised ventilators, and spacious vestibules with low, descending steps are the important features.

Installation of the twenty new cars will give the railroad 50 steel motor cars and fifteen steel trailers.

Extensive Track Projects in Washington, D. C.

It is estimated that the pending project for the extension of the Capitol Plaza Parkway in Washington, D. C., will cost the electric railways $500,000 in relaying their tracks. Under this plan it is proposed to take the tracks in the vicinity of the Union Station and the Capitol underneath the parkway in a subway. Stations will be built for the Senate and House office buildings. The federal government will pay for the construction of the subway but the grading and the cost of track relocation is left to the railways to pay.

This park extension plan has already passed the House and no opposition is expected to develop to it in the Senate next December. The car companies have no desire to take their cars off the streets in the Capitol area because much tourist business at present originates there.

A provision made in the Capitol Park extension measure provides for construction of subterranean garages of 400 car capacity to be used by Congressmen and employees of the Capitol. The lighting of the subway will be left to the street car lines. Besides the improvement projected for the Capitol area, the federal government has already approved a $500,000,000 park and building development in the triangle section between the Capitol, the Monument and Pennsylvania Avenue. This last plan not only calls for several subways but also requires extensive surface track reconstruction.

Equipment Market Continues Good

During the past few weeks a number of railways have announced the completion of their track program for this year. Although the average volume of orders has decreased, a number of good size orders have been placed and several large projects have been announced. Chicago Surface Lines, Chicago, Ill., has placed orders for 110 80-ft. center radius switch tongues, 50 160-ft. center radius switch tongues, 6,500 lb. of high carbon welding rod, 2,000 lb. of high manganese coated welding rod, 4,000 lb. of low carbon coated welding rod of grade 200, 2,000 6x8-in.x8-ft. sawed red oak ties creosoted, 50,000 lb. of 1x4⅛-in. track bolts with square nuts, 24 spring switch throw boxes, 400 16x2¾x1¾-in. grinding wheels, 18,900 gal. of Tarvia-X and 8,900 gal. of Tarvia-A.

Creosoted pine ties numbering 3,200 and 1,000 white oak cross ties have been ordered by the Arkansas Valley Interurban Railway, Wichita, Kan. This company has also ordered switches and other material for two sidings and five double-end sidings. Paving of its double track right-of-way on Broadway, Gary, Ind., has been started by the Gary Railway, Gary, Ind. Also between 40th and 45th Avenues on Broadway, this company is raising its track to the new surface level and is thermit welding the rails.

Replacement of the present track in Michigan City, Ind., with 130-lb. rail has just been started by the Chicago, South Shore & South Bend Railroad, Michigan City, Ind. Lengths of 66-ft. rail will be set on creosoted ties in concrete for a distance of 2 miles. It is expected that this work will be finished shortly after the first of the year.

Rail Relaying Completed

The Chicago, South Shore & South Bend Railroad rail relaying program for this fall was completed with the recent installation of 100-lb. rail laid along LaSalle Avenue from College Street to Cummins Siding. The new Buchanan siding using 3,800 ft. of 100-lb. rail has just been completed. Track on the state line curve at Hammond is now being re-layed with Sanborn Sorabatic 100-lb. rail. This stretch of curved track will be reinforced with girder type rail and new protective devices will be installed at the Western Indiana crossing when 2,000 ft. of new track is laid.

Progress on the new interchange with the Monon Railroad, west of Michigan City, which is the company's biggest construction job of the year, has been maintained with approximately 7,000 ft. of track now laid and 60 per cent of the grading completed.

The Memphis Street Railway, Memphis, Tenn., is progressing with its extension on the Jackson Avenue line from Watkins Street to University Boulevard. Work was begun on this project on July 10 and is reported now to be approximately 50 per cent completed. This company is also replacing old T-rails and gravel pavement with 7-in. rail and asphalt paving on Commerce Street between Chelsea Avenue and the city limits. This company has purchased a road oil heating kettle with an attachment for distributing the oil under pressure. The company is doing a large part of the asphalt paving repairs formerly made by the city. Rock asphalt is being used. Fifty 35-ft. tubular steel poles, 50 pieces of 8-in. extra heavy steel pipe and 50 pieces of 6-in. standard steel pipe, 201 Manchester positive plates and 110 positive and negative elements have been ordered by the Chicago Surface Lines. The Arkansas Valley Interurban Railway has ordered 2 miles of 0000 grooved trolley wire.

Rehabilitation Program

The first step in a rehabilitation program which will provide complete new feeder wire from Gary to Crown Point, Ind., was begun recently by the Gary & Southern Traction Company, a 12-mile interurban line now operated by the Gary Railways. The present work consists of renewing all center poles on 45th Avenue between Broadway and Grant Street and the installation of span construction. Two freight trailer cars have been ordered by the Arkansas Valley Interurban Railway. The Chicago Surface Lines has ordered three dual motor type Twin coaches and the Boston Elevated Railway, Boston, Mass., has ordered six urban 28-ft. Twin coaches.

The Pacific Electric Railway, Los Angeles, Cal., has ordered one 16-passenger Fageol special parlor car type bus. The Washington Railway & Electric Company, Washington, D. C., has received four new type V 29-passenger Yellow coaches. The Community Traction Company, Toledo, Ohio, has ordered twelve buses from the White Motor Company, costing $114,000.

Excavation work for the foundation of a $400,000 addition to the company's power plant has been started by the Columbus, Delaware & Marion Electric Company, Marion, Ohio. This power plant will house two boilers capable of developing 8,000 hp.

Car and Bus Station for Milwaukee

A sheltered loading station for street cars and motor buses, erected so that all loading and unloading of passengers will be under cover, will be constructed at a cost of $40,000 by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., at 27th and Hopkins Streets, Milwaukee, Wis. The growing flow of traffic through the intersection is hampered by loading of street cars, and the situation becomes particularly acute during rush hours.

The company has agreed to remove the switching, layover and loading of

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its cars entirely from this point. The new station will be on private property of the company, extending from the congested district and located about 100 ft. from the intersection. Double loop tracks will be constructed to accommodate both 12th and 27th Street cars, and a driveway will be provided for buses.

Improvements in Alliance

To reduce damage claims from grade crossing accidents, the Stark Electric Railroad, Alliance, Ohio, has filed a standing order for one flashing signal to be delivered each month. More than a dozen are to be installed at a cost of $1,000 each.

Work of improving the track between Alliance and Sebring has been started by workmen. New ties are being placed and joints improved. Cost of the improvement is estimated at $8,000.

In the Mount Union district of Alliance workmen are completing a street improvement project estimated at $56,000. The company is placing a new base and installing new track for a distance of nearly ½ mile on this project.

Paving Brick Association Reports on Highway Conditions

The Engineering Commission appointed by the National Paving Brick Manufacturers Association, Washington, D. C., has made its report on the investigation of paving and general highway conditions. This investigation embraces conferences and correspondence with the United States government, state, city, county, borough and township officials in charge of paving throughout the country, a comprehensive study of technical literature on paving, and a general field inspection of typical paving conditions in the Southern, Middle Atlantic, New England, Eastern and Mid-Western states.

The object of the investigation was to obtain an up-to-date picture of the trend of the highway business in the territory embraced in the survey and also to especially investigate the brick paving situation throughout the country.

The report contains a general discussion of the highway business and the engineering and economic principles that should govern the business. A statement of the standard types of road surfacing and pavements applicable to the different traffic, social, local, climatic and subsoil conditions throughout the country. A general discussion of the brick paving situation, results of special tests and investigations and recommendations relative to method of construction and specifications for brick pavements are also included.

The report places the total highway expenditures at about $2,000,000,000 a year and the waste due to incompetent supervision is estimated to be about $400,000,000 a year. Considerable stress is placed upon the necessity of employing only trained highway engineers to supervise all highway work so that this waste can be eliminated. The statement is made that the paving programs including new construction and reconstruction will grow larger each year in both the centers of population and on rural highways and, due to the constantly increasing traffic, there will be a considerable increase in the higher type construction, particularly on the rural highways.

The report discusses various phases of the highway business, such as lack of understanding of highway problems by public, highway administration, the ultimate highway transportation system, how hard-surfaced roads pay for themselves, through savings in motor vehicle operating costs, planning highway systems, highway transportation investigations, location of highways, savings in motor vehicle transportation costs due to relocations resulting in shortening the distance, by-pass highways, ultimate width of highway rights-of-way, day and night signals, elimination of dangerous conditions, trend in highway construction, standard types of pavements and traffic and maintenance data.

The advantages of vitrified paving brick for street railway tracks and for progressive construction lie in the fact that unit type pavements are unquestionably the most desirable and economical pavements between and adjacent to street railway tracks, and brick pavements are very extensively used under such circumstances. With this type of pavement, repairs can be made to the rails without destroying the paving.

Weekly Business Conditions

The volume of business during the week ended Nov. 3, as seen from check payments, was somewhat smaller than in the previous week but was larger than a year ago, according to the weekly statement of the Department of Commerce. Activity in steel plants showed expansion, as compared with both the preceding week and the corresponding period of 1927. Prices for iron and steel and copper averaged higher than in either the previous week or the same period a year earlier.

WEEKLY BUSINESS INDICATORS

(Weeks ended Saturday. Average 1923-25 = 100)

	1928				1927			
	Nov. 3	Oct. 27	Oct. 20	Oct. 13	Nov. 5	Oct. 29	Oct. 22	Oct. 15
Steel operations	114.5	113.2	115.8	115.8	86.0	86.0	84.0	87.0
Bituminous-coal production	.....	115.4	111.1	115.7	92.6	102.8	105.5	108.3
Lumber production	.....	92.3	92.3	90.9	105.5	104.5	105.5	106.4
Petroleum production (daily average)	.....	.....	120.2	120.3	117.8	118.4	119.2	119.7
Building contracts 37 states (daily average)	122.4	144.9	135.7	134.3	86.3	131.8	152.0	115.1
Price iron and steel composite	86.3	86.1	85.9	85.6	85.8	85.8	85.9	85.9
Copper, electrolytic, price	113.0	110.1	108.7	108.7	94.9	94.2	93.5	94.2
Interest rates, call money	181.8	160.6	157.6	157.6	87.9	84.8	93.9	97.0
Interest rates, time money	160.0	160.0	155.3	165.7	100.0	102.9	100.0	97.1
Federal reserve ratio	86.7	87.7	86.8	87.2	96.0	97.2	96.9	96.8

Bond prices averaged higher than in the preceding week but were lower than a year ago. Interest rates for time funds showed no change from the previous week but were higher than last year. Interest rates for call money averaged higher than in either prior period. Stock prices receded from the high level of the preceding week but were still considerably above the level of last year.

The production of bituminous coal during the week ended Oct. 27 showed gains over both the previous week and the same period of last year. Freight car loadings for the latest available week were larger than in the corresponding period of 1927.

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

	Nov. 7, 1928
Metals—New York	
Copper electrolytic, cents per lb	15.775
Copper wire, cents per lb	17.875
Lead, cents per lb	6.5
Zinc, cents per lb	6.60
Tin, Straits, cents per lb	49.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.375
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.80
Franklin, Ill., screenings, Chicago, net tons	1.375
Central, Ill., screenings, Chicago, net tons	0.675
Kansas screenings, Kansas City, net tons	1.875
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.5
Weatherproof wire base, N.Y., cents per lb.	18.625
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.4
White lead in oil (100-lb. keg), N. Y., cents per lb	13.25
Turpentine (bbl. lots), N. Y., per gal	$0.60

ADVERTISING LITERATURE

OHIO BRASS COMPANY, Mansfield, Ohio, has just published a sixteen-page booklet with complete descriptions and illustrations of the new 250 and 600-volt light-weight portable electric arc welding machines for use on electric railway track circuit bonding and general repair work. The principle of unit construction of the resistance elements in these machines is fully described and brief illustrated reference is made to the various types of rail bonds manufactured by that company.

SULLIVAN MACHINERY COMPANY, Chicago, Ill., has issued a new bulletin 76-J describing Sullivan electric portable hoists. This bulletin includes hoists from 10 to 35 hp., in both single and double drum patterns.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has issued bulletins 821A descriptive of pressure and vacuum switches, 71B descriptive of wound-rotor induction motors 900 series, and 81B describing high-torque, double squirrel-cage motors.

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Consider Cleveland's Articulated Cars

The twenty-five articulated cars recently placed in service by the Cleveland Railway are speedy and comfortable. They represent the latest development in transporting a large number of passengers without increasing traffic congestion. Quick loading and unloading is another important feature. Patrons of the Euclid Avenue Line are well pleased with these cars which were built in Cleveland by The G. C. Kuhlman Car Company.

These articulated units are reducing the operating schedule and effecting considerable economies, according to the president of the railway. Such facts are additional proof that modernization with Brill Cars is a sound and profitable investment.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

Pacific Coast Representative: Rialto Bldg., San Francisco

BRILL MODERN CARS

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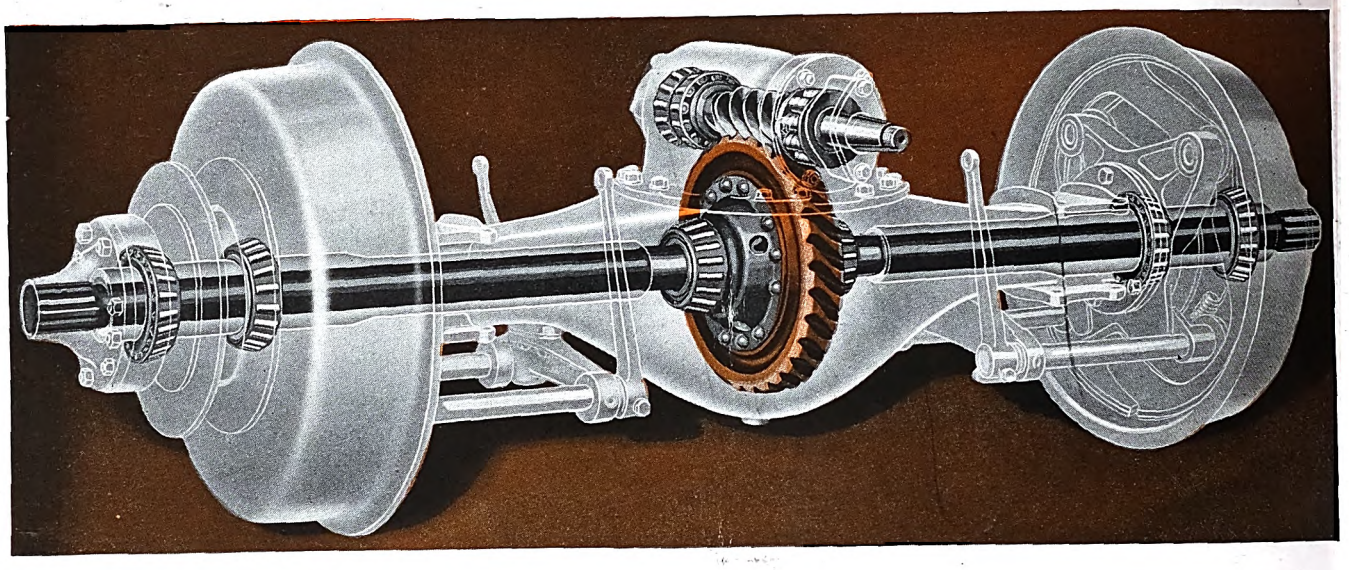

First cost higher
last cost lower

What you get is more important than what you pay in determining real value.

Timken Worm Drive costs more to manufacture. Its first cost is therefore higher.

But Timken users know that its last cost is much lower.

Timken Worm Drive Axles deliver long life, low cost of maintenance, strength, simplicity, dead silence—in other words, satisfaction.

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

TIMKEN AXLES

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MAINTENANCE AND CONSTRUCTION ISSUE

ELECTRIC RAILWAY JOURNAL

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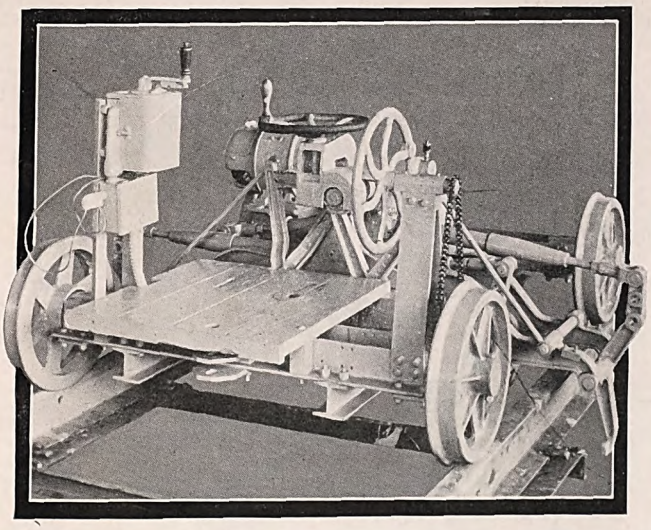


Mass Production Methods *Discussed at the* Convention

In a paper read before the convention on mass production methods, the general manager of a large city property said:

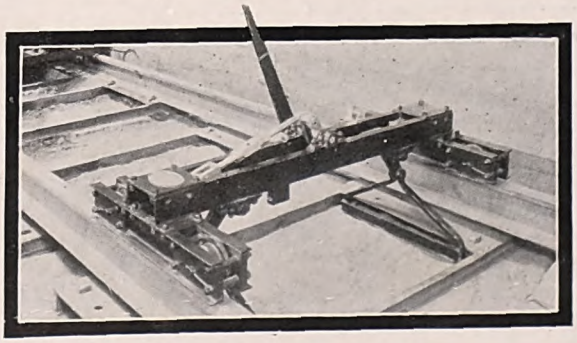
"Thus within recent years the principles of mass production have been carried out with great success in connection with the construction of new track."

The superintendent of way and structures of the same property which has led in the developments of special track machinery, said in a paper read before the convention:

"Since this program was to include the reconstruction of approximately thirty miles or more of single track per year it was deemed advisable to investigate and improve the methods used for track construction to speed work and reduce cost to a minimum."

For your 1928 track building program, investigate the latest track designs and mass production methods which are making the track dollar go farther and the maintenance dollar more unnecessary than ever on over 200 properties in the United States, Canada, Mexico and South America.

THE INTERNATIONAL STEEL TIE CO.
CLEVELAND, OHIO



STEEL TWIN TIE TRACK
THE BASE OF MODERNIZATION

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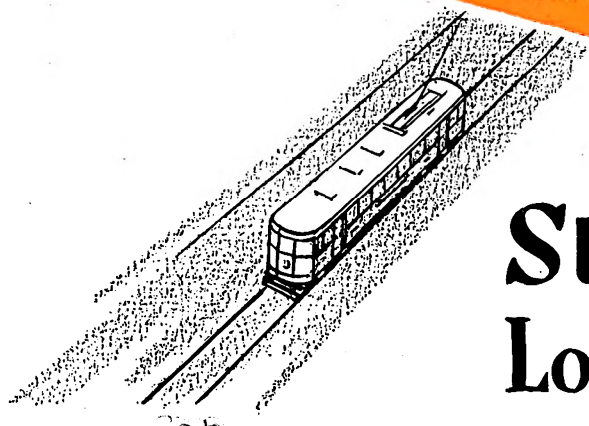
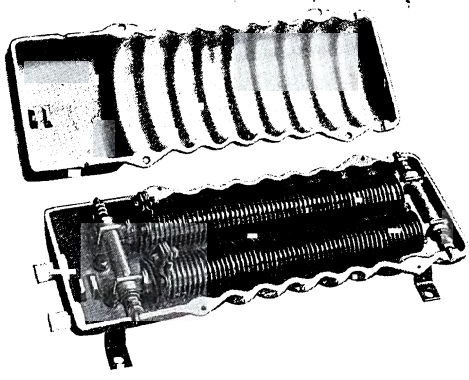
Returns 15% On Investment



Starting Resistor Losses *put to* Work *in* Heating Your Car *with* Type "M" Car Heaters



A typical installation on Omaha and Council Bluffs Street Railway for quadruple 510-C-2 motors using type K-35 control.

Ten type M Heater Units.

One type TK-452-A Change-over Switch.

One type 371-C-22 Ground Relay.

THE average city car, operating on 500 volts and making seven stops per mile, has starting resistor losses of from 400 to 500 watthours per car mile. Assuming that your car runs 35,000 miles per year and that heat is required on 200 days, the new Westinghouse Type M car heater will utilize enough of the ordinarily dissipated power to return 15 per cent on the investment after all fixed charges, maintenance and depreciation have been paid.

Ask the Westinghouse Salesman.

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MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA 1928

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Electric Railway Journal

McGraw-Hill Publishing Company, Inc.
James H. McGraw, *Chairman of the Board*
Malcolm Muir, *President*
H. C. Parmelee, *Editorial Director*

Consolidation of
Street Railway Journal and Electric Railway Review

CHARLES GORDON, *Editor*

Louis F. Stoll,
Publishing Director

Volume 72 New York, Saturday, November 17, 1928 *Number 20*

Get Ready for Winter

THE winter season brings added work to most maintenance departments. Passenger loads are heavier because rain, snow and slush make walking and automobile driving disagreeable, and more people seek the comforts of street cars and buses. Stops are longer and so the schedule is more severe. The equipment itself is subjected to more abuse. Frequently cars must operate through water or slush. More sand must be used and this adds another potential source of trouble. Salt used to keep switches open sometimes causes electrical equipment difficulties.

All this means that increased attention must be given to maintenance work and added precautions taken to prevent service delays. Regular and thorough inspection of equipment is of course, the first step in avoiding failures. At this season of the year many precautions can be taken that will avoid difficulty later. Stocks of repair parts should be checked to make certain that sufficient are on hand to take care of added requirements. Lubrication must be watched closely and care taken to make certain that gear cases are tight and that covers for journal boxes and bearing housings fit tightly. Car wiring at such points as resistors and motors should be gone over carefully. Leads should be cleated firmly to prevent rubbing and chafing. A little extra work now will pay liberal dividends in reduced trouble during the winter.

From Coal to Current

FROM Philadelphia has come news of another electrification. It is the announcement of the plan of the Reading Railroad to spend $20,000,000 on through routes embracing the community territory of Philadelphia. But the matter does not stop here. The work soon to begin presages ultimate electrification from Langhorne to New York, from Jenkintown to Philadelphia, and, after the completion of grade crossing elimination at Manayunk, through the Schuylkill Valley to Reading and Pottsville.

While the work now announced by the Reading is overshadowed by the immensity of the program contained in the recent statement of the Pennsylvania Railroad, in many respects it is no less significant than the Pennsylvania announcement, particularly in that it portends the application of electricity to the entire Reading main line. Obviously the process is one of piecemeal application. Still the facts as stated change from their nebulous form to one of real substance plans that have long been in the process of making.

However fascinating it may be to ruminate over the reported prediction of the president of the largest locomotive works in the United States that all railroads along the Atlantic coast from Boston to Washington may be electrified within ten years and to cogitate the statement that steam gradually is being driven to the great open spaces, tangible evidences are sufficient for the present. Among them are the fact that the Reading, like the Pennsylvania, is going to use the 11,000-volt a.c. system, that it presumably will purchase its power, and that bids on the preliminary work of electrification, as well as on the construction of 100 coaches, will be asked within the next two or three weeks.

So it is that the Reading statement reflects the growing realization of the value of electric propulsion as an aid in speeding up service and in increasing track capacity. It also reflects the feeling of confidence in the efficacy of superpower as best instanced in the case of the Conowingo development and the interconnection of the power systems along the north Atlantic seaboard. In other words, the steam roads have concluded that the great utilities along the railroad lines, already customers of the railroads for transportation, can well supply them with electric energy. Whether or not one accepts the prognostications of the most optimistic of the prophets of the coming age of electric propulsion for main lines, attrition is gradually changing from a prediction to a fact the process summed up in the slogan "from coal to current."

In the Interest of the Company and the Community

OUT of the chaos incident to an expiring franchise, the maturity of bonds, the impending destruction of its credit, and distrust of the company by the public, order is slowly being restored at Omaha, but this will be only a beginning toward better transit if the city continues to play fair with the management. It is easy to dismiss this work of a year with a single sentence that records the double news that the new franchise for 30 years was passed at the recent election and that the proposal was lost to authorize a bond issue to provide funds for establishing a free bridge instead of the communities buying the present one from the railway, but that would take very little account of the record of the past and none of the possibilities of the future. And that is not a good thing.

To say that the vote of confidence in the company at Omaha was well deserved is to reiterate a truth, but it is equally true that similar favorable response is not always secured. Present concern is not with the academic question of what is and what is not ethical treatment, rather is it with the prospects ahead. The new franchise represents the work of several months by its sponsors. It protects the company and the city. It is not of the so-called service-at-cost variety, but it is forward looking in that it provides for orderly development of the local transportation system in Omaha in the future and for

This is the issue in November that is devoted essentially to maintenance and construction subjects

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co-ordination of cars and buses. The drafting of the grant, the principal provisions of which were reviewed in the issue of ELECTRIC RAILWAY JOURNAL for Nov. 10, was approached by the management from the angle that Omaha is a great progressive city, but that to maintain that position, the city must have an up-to-date local transportation system with the railway as its backbone. And in urging the grant the representatives of the company suggested to the voters that they try to visualize Omaha without street cars.

On the bridge proposal, discussed in an editorial in the JOURNAL for Nov. 3, page 789, the public certainly reacted favorably to the clear-cut, frank explanation of the position of the company, since the voters rejected the proposal to erect a new free bridge. Negotiations will now be begun for the sale of the railway's present bridge to the community.

During the franchise campaign President Shannahan did not mince words about the fact that the company was fighting for its very life, even saying to the rank and file that that "means that you men are fighting for your jobs, for if the franchise is lost that means receivership and probably bankruptcy." The disposition of the franchise and bridge issues appear to indicate that the new management has been successful in converting the public to the understanding that the best service at the lowest cost can only be obtained in a community through the operation of all public transportation by one efficient organization. Certainly the management has succeeded in having the employees realize that their interests and those of the company are the same, with the result that they are making every effort to be useful public servants in an honest endeavor to make friends for themselves and the company. These are the fundamental principles essential to successful local transportation. In securing their acceptance the company has accomplished something really worth while for itself and for the community which it serves.

Detroit Rid of Its Jitneys

AT LAST Detroit has gotten rid of its jitneys. It was a six-year fight. Offhand it might seem that a city would have control of its own streets, and the United States Supreme Court has so ruled in certain cases, but in the jitney case that issue did not apply or was not raised. The case has been followed in the JOURNAL in its various legal phases, but present concern is not so much with the technical issues involved in the suit as it is with the prospects for the future.

No sooner had their rights been abridged than the jitneys became very humble. Whereas they had been amenable only to their own self-imposed regulation, operators are now ready to submit to any reasonable regulation, to run under the direction and control of the very officials whose authority they had questioned and to furnish suitable bond or surety and to comply with any requests of the city. But it would appear that their humility has come too late.

The jitney as a jitney is an anachronism. In Detroit it found a place for itself only because of the peculiar local situation incident to the city taking over the local lines of the Detroit United Railway and being required to convert an inheritance of junk into an articulate system during the period of Detroit's most rapid growth, an era that saw great advance by the automobile as a public transportation agency. This was the period that saw the development of the local transportation system under city auspices to the point where the property had been virtually rebuilt, the articulation of the railway and the bus in service under the same auspices, the subsequent use of the bus in mass transportation by the Detroit Motor Bus Company, and the promulgation of grandiose plans for rapid transit development which have not yet materialized. Meanwhile resort was made to various expedients, the jitneys being forgotten except for the legal battle being waged against them.

With the jitneys off the streets, the municipal railway department is going ahead with its plans for still greater co-ordination of rail and bus lines, but it remains a fact that it has been quite a problem to assume over night the traffic load so suddenly thrown upon the local transportation system by the withdrawal of the 500 jitneys. The latest proposal is a de luxe bus service for Grand Avenue and for Woodward Avenue, with 16-passenger vehicles, a service the municipal railway department was precluded from rendering so long as the jitneys were being protected temporarily in what they assumed were their rights. This is another move and a forward-looking one in the greater articulation of the transportation services of the city, anticipatory of the time the city actually does something really worth while transit-wise. The management of the systems as now constituted is able, but under the present conditions limitations are imposed that preclude anything like the realization of real rapid transit service.

To Help Them Stop, Look, And Listen

THE need for uniformity in highway crossing protective devices grows daily. Last year, according to figures compiled by the Interstate Commerce Commission from reports of Common Carrier Railroads of the United States, 2,371 persons were killed and 6,613 were injured in highway grade crossing accidents. Compared to this only 402 individuals were killed and 675 injured in similar mishaps in 1890. It is obvious that this increase in casualties from 1890 to 1928 can be credited almost, if not wholly, to the advent of the automobile as an attractive private transportation vehicle.

Vehicular speeds have steadily increased from those possible in the '90's until at present automobiles are traveling the highways of the country at rates equaling and in some instances exceeding those of our fastest trains. To beat the Twentieth Century Limited is a sport which has stirred the imaginations of motorists and even engaged the efforts of motorboat speedsters. Despite the recent Supreme Court decision putting the blame on the motorist for collisions involving railroad trains, such accidents continue to exact their toll of human lives. Apparently the mechanical limitations to the speed of modern motor cars—still far from reached—constitute the only deterrent to the rate at which occupants of these fast-moving vehicles can and do approach and pass over railroad crossings. Whatever effect the precautionary "Stop, Look and Listen" appeal ever possessed has long since been completely dissipated.

The horse-drawn vehicle carried, at best, three or four persons in addition to the driver, and everyone generally was in a position to protect himself from dangers incidental to crossing railroad tracks. Except for a runaway the rate of travel with horses was sufficiently leisurely to permit of the safe abandonment of the carriage in any emergency and at any normal pace. Not so with the modern motor car, to say nothing of the 30 to 40-passenger bus. In either instance the passengers are wholly dependent upon the skill and discretion of the driver to protect them from hazards of the road, including col-

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lisions with other mediums of transportation. Motor vehicles travel distances never possible with horses. Single trips may extend through several states or even from coast to coast. A trip of 300 to 500 miles in a day is no longer uncommon. Highway travel such as this, when considered in the light of the annual grade crossing casualties resulting therefrom, represents an incontestable reason for the standardizing of railroad crossing warning and protective devices whose very uniformity will constitute a factor favorable to their observation by travelers.

There is certainly the most acute need for the development of a system of signs, so standardized in size, shape, color and wording, that a motorist, speeding over improved highways, perhaps through entirely unfamiliar territory, may instantly comprehend the specific warning intended by that type of sign wherever he encounters it. An attempt at uniformity is to be found in the signs bearing the numbers of the so-called federal highways. It becomes all the more necessary then, that from this beginning in standardization as applied to highway markings these same motorists, growing accustomed to uniform highway markings, be given the benefit and the added protection of a similar standardization in devices or signals denoting the presence of railway trains.

Take Advantage of Improved Parts and Repair Materials

IN ELECTRIC railway maintenance it has been proved again and again that the use of the highest grade repair parts and materials obtainable is most economical in the long run. Very little calculation is needed to demonstrate that fact. The cost of a single service failure will wipe out many dollars of apparent savings made in the purchase of materials or parts. But the use of high-grade parts is not alone sufficient. The opportunity frequently exists to incorporate improved designs that offer better performance, increased reliability or other distinct advantages in comparison with the original part or material that is being replaced.

When a car is down it should stay down until thoroughly ready to be placed in service again. The best insurance against service failures lies in doing a thorough job of repair or overhaul. Frequently that involves, also, taking advantage of the many new materials and improved parts available to the maintenance departments. One company is installing manganese wear plates at truck points subject to excess wear. Another is substituting higher grade springs for those used in the original design, as the original springs were found to sag after considerable use. In the repairing of armatures, modern insulation permits the use of a dielectric strength superior sometimes to that of the original armatures.

Serious defects may appear in original equipment. Obviously it is poor business to perpetuate the trouble, and the only remedy lies in the adoption of an improved part or material. On one large property which experienced a great deal of trouble from broken armature shafts on practically all types of motors, the adoption of a high-grade alloy steel at considerably higher unit cost of material, resulted in a large reduction in service failures and effected a large ultimate saving in actual repair bills. Changes in design of standard parts should, of course, be made only with extreme caution and after thorough experiment and consultation with the manufacturer of the original equipment. But there should be no hesitation in the adoption of improved parts or materials that will increase reliability, improve performance or reduce operating or maintenance costs. When overhauling or repairing equipment there is frequently an opportunity to take a step forward instead of merely making replacements in kind. Failure to take advantage of this opportunity is not in keeping with the modern spirit of progress in the industry.

Robots Not Wanted on the Platform

CONCEPTIONS of Carl Capek, creator of the fictional robot and successor to Mrs. Shelley, who introduced Frankenstein as the father of automata, appear likely to be outdone by the engineer in his developments of the mechanical man. Televox proved this at Cleveland, although the application was not one with which the man on the street is likely to come into contact. But your average man won't have to wait long. Capital, big capital, has promised us that soon the nickel cigar in our favorite emporium will be handed to us by a mechanical figure in the outward garments of a man who will thank us no less feelingly than does his slightly more human counterpart now behind the counter. And the 5 and 10's are going in for the same thing. Yet there is not much reason to fear that soon all of us will have nothing to do but move about in a world in which the automata about us will make man conspicuous by his very mobility.

We cannot, for instance, conceive the automatic conductor, even though some of the present generation of conductors have at times by their seeming indifference offended much more than could any mechanical man, from whom cut and dried answers are to be expected. If a conductor was nothing more than a mechanism for ringing up fares, then street railway men might be expected to welcome Televox. But the man on the platform must be far more than that. "Ride salesmanship" or "trainmanship" express present-day thought on the requirements of the platform man. To achieve these qualifications, methods of education and training are receiving wide attention.

Drill was one of the words used in Cleveland. This at first has a strange connotation. Too often it is associated purely with physical movements. But there are far greater possibilities in the word. The conductor has become a great asset to his company who can always be counted upon to enforce a rule so that the rule will not be made to appear to have been drawn to govern the passenger. Likewise that man on the back platform is an asset who always shows a sincere desire to serve the public. Again, by careful training the platform man can be so instructed as never to try to prove the passenger wrong even when he really is.

There are some men who never could be made to understand the niceties of passenger psychology so that the reaction of routine contacts will redound to their own benefit at the same time they appease the passenger. But they can perhaps be taught and trained, through a process of drilling, to handle the many situations that arise on a car platform in a manner calculated to produce desirable reactions. Drill does not necessarily make robots of men. The actor and the public speaker are drilled. The debutante's finishing school includes the process of drilling. Drill consists of practice which makes proper performance easy and semi-automatic. A school of trainmanship may profitably be a course in platform drill.

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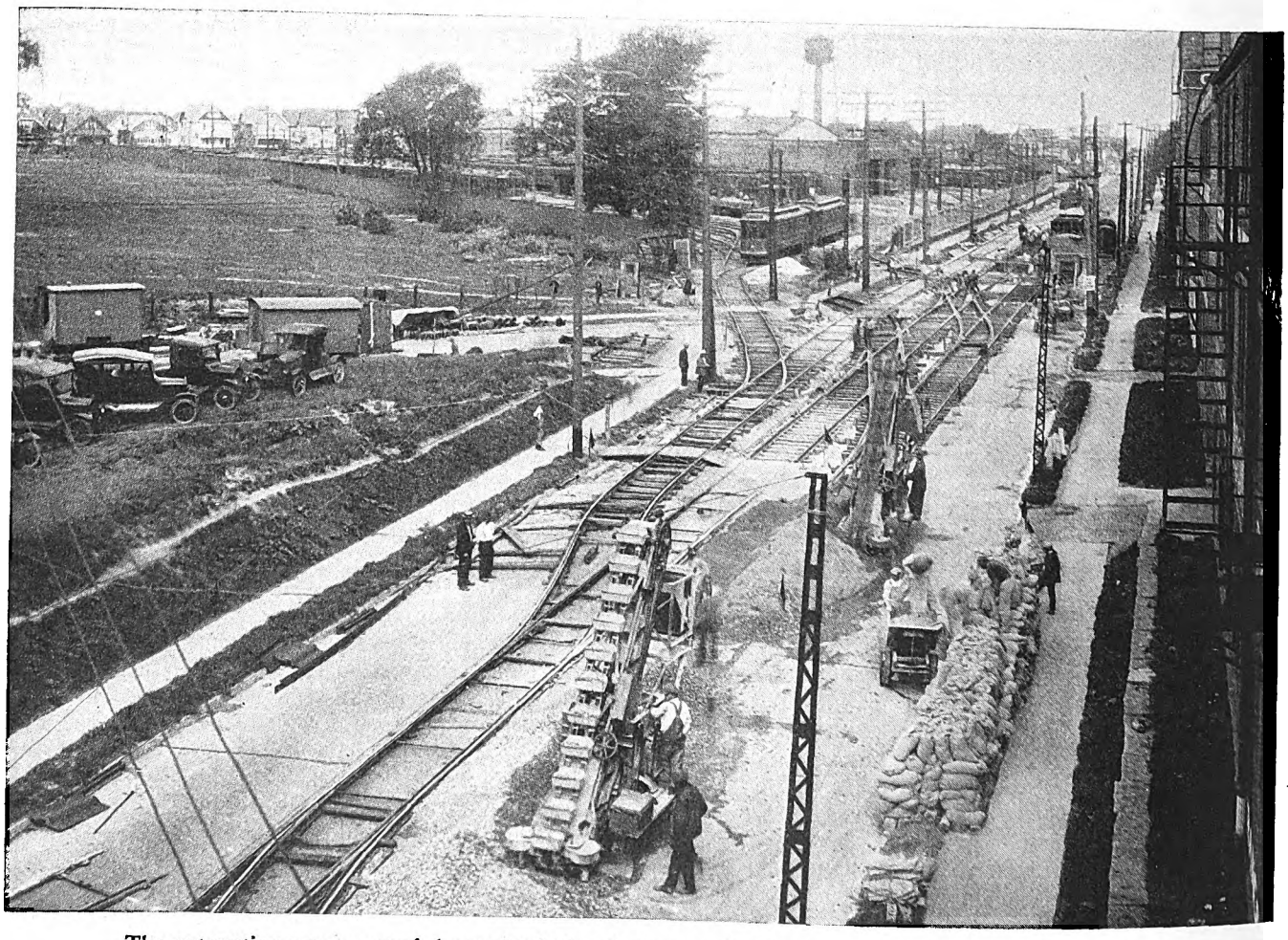
Mechanical Methods

Expedite Track Paving

Machines and organization in Milwaukee permit the laying of 700 to 900 sq.yd. of concrete pavement in eight hours

By F. G. Hibbard
Assistant Engineer of Way and Structures
The Milwaukee Electric Railway & Light Company,
Milwaukee, Wis.



The systematic arrangement of the mechanical equipment on the street expedites the track paving operations

ON MANY railways, both large and small, concrete is now the standard for track zone pavement. This increased popularity of concrete for street railway track zone pavement must be justified, for its extended use by traction engineers is undoubtedly based on satisfactory experience.

Good materials are essentially necessary for good concrete pavements. For guidance in the selection and testing of materials for concrete pavements, the Milwaukee Electric Railway & Light Company uses specifications of the American Society of Testing Materials. The company is fortunate in having an exceptionally good deposit of sand and gravel; also an excellent quarry supplying a high grade of crushed stone. When thoroughly washed, these materials are well adapted for the manufacture of concrete.

For several years we have been using the fineness modulus theory developed by Prof. Duff Abrams and

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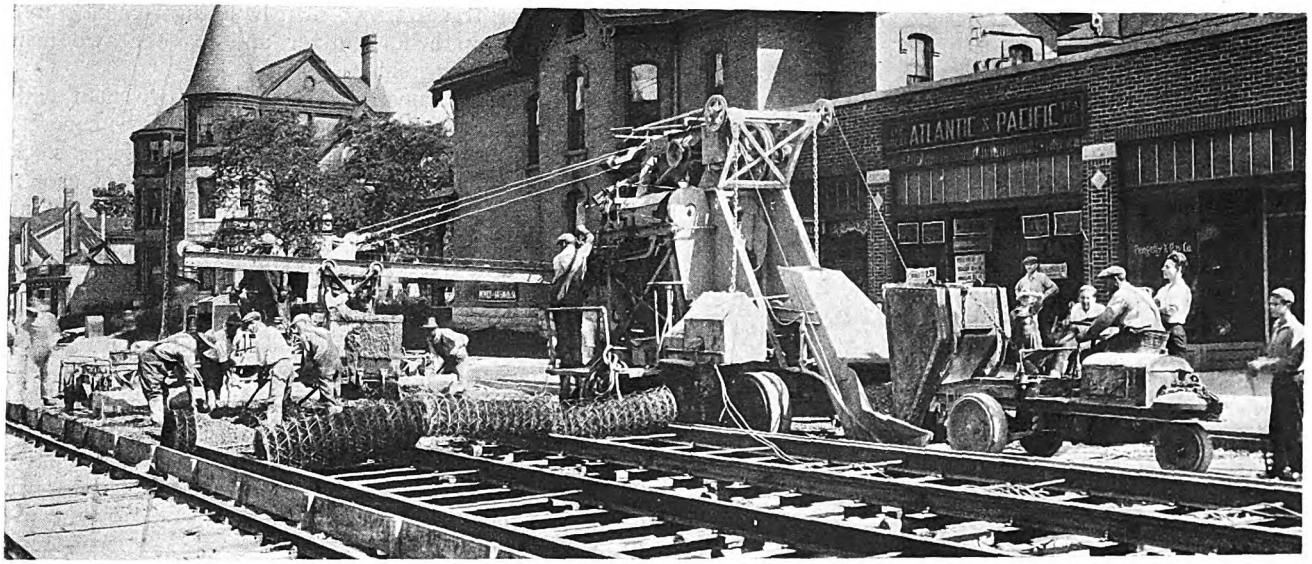

Laying the top course, handling the "mix" almost entirely by machines

methods proposed by the Portland Cement Association in the designing of concrete mixtures. Our specifications call for a 1:2:3½ mix or a ratio of one part of cement to 5½ parts of sand and coarse aggregate. Instead of starting with a specified strength as is usually done and working to obtain this with a minimum of cement, we start with a fixed amount of cement and strive to secure concrete with the highest possible strength and wearing qualities.

Modern Equipment Reduces Labor

In determining the equipment for laying concrete pavement we were obliged to give first consideration to the limited space between car tracks and curbs. Our plant was laid out to work efficiently in this restricted area. A 21-E mixer mounted on rubber-tired wheels, which permits easy transportation over city streets, is equipped with a boom of sufficient length to dump the concrete into the track zone when the mixer is placed on the side of the street. Two Barber-Greene loaders, one for sand and one for gravel, with accurate measuring hoppers are used for loading these materials into three-wheel Clark Tructractors for transportation to the mixer. These tractors can be maneuvered in a very limited space and are equipped with dumping bodies of sufficient size to carry a full charge for the mixer. The cement is loaded by a specially designed skip so as not to slow up the operation of the tractors, as a result the loading of cement directly from stock piles takes place. A special adaptation of the Lakewood finishing machine, which was developed by our company after a year of experimental work, permits us to strike off, tamp, form the throatways and belt the concrete so that a minimum amount of labor is required in spreading the concrete and finishing the pavement.

Materials Carefully Measured

The amount of material per foot of track is carefully calculated, and where sufficient room is available between the curb and track, the necessary sand and gravel are dumped from differential motor dumping cars approximately as shown in an accompanying illustration, and the cement is piled on the parking strip between curb and sidewalk. When the street width is too limited to permit of the proper storage of materials, a temporary curved track is used to carry the storage piles to the intersecting side streets. This track is specially constructed in sections so that it may be laid on top of the permanent track and removed in a short time and at little expense. After the materials have been placed, the equipment is moved into position, the loader hopper set to measure the predetermined quantities of sand, gravel and cement, and the water gage on the mixer set for the correct amount of water for each batch.

The sequence of the operations is as follows: The tractor receives the proper amount of gravel for one batch from the loader, proceeds to the cement skip and then to the sand loader for the correct amount of these constituents, and then dumps the load directly into the mixer skip. As the cement is loaded between the gravel and the sand there is little danger of its being carried around the street on windy days, and it does not adhere as readily to the mixer skip. After the proper mixing time which is controlled by a batch meter, has elapsed, the concrete is so deposited as to avoid an undue amount

The gravel loader speeds the handling of the aggregate

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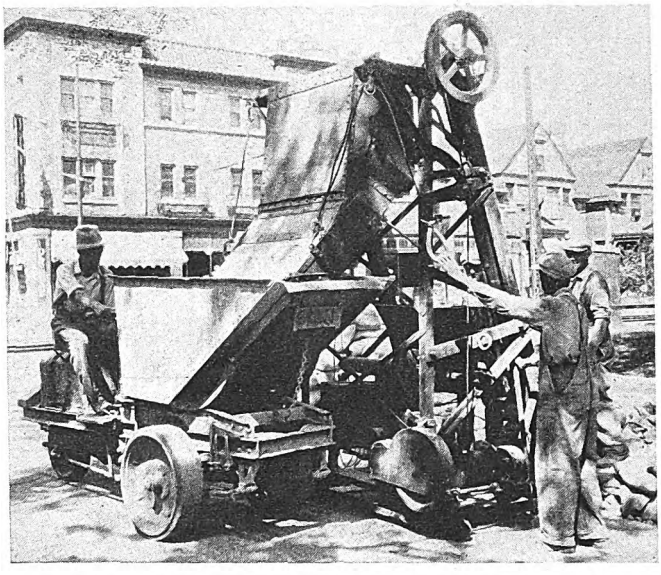


Cement skip shown in action

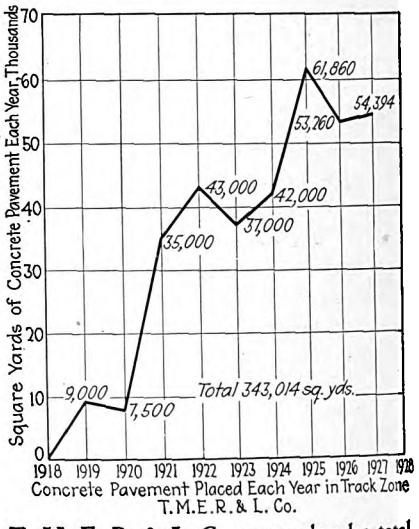
of shoveling. It is then carefully spaded around the rails and ties to a depth of 2½ in. below the top of the rail for a length of approximately 50 ft. Type 0583 American Steel & Wire triangular mesh reinforcement is then placed in position and immediately covered with a top course of concrete which is struck off flush with the running surface of the rail by the finishing machine at the same time it tamps and forms the throatways. The surface is then belted and the edges of the throatways dressed by hand finishing. The reinforcement is handled in rolls and is spread out as required. The concrete is laid with about a 1 in. slump which requires tamping but once to produce sufficient mortar on the surface for finishing. Excessive tamping produces too much mortar on the surface, disturbs the uniformity of the mix and does not leave the wearing surface in a good condition to resist impact and abrasion.

The following crew is employed in placing concrete pavement: Three men spreading concrete, one man on reinforcement, one man operating finishing machine, one man operating mixer, two men operating loaders, three men operating tractors, two men handling cement, three men cleaning up behind mixer and loaders, two men finishing and one foreman.

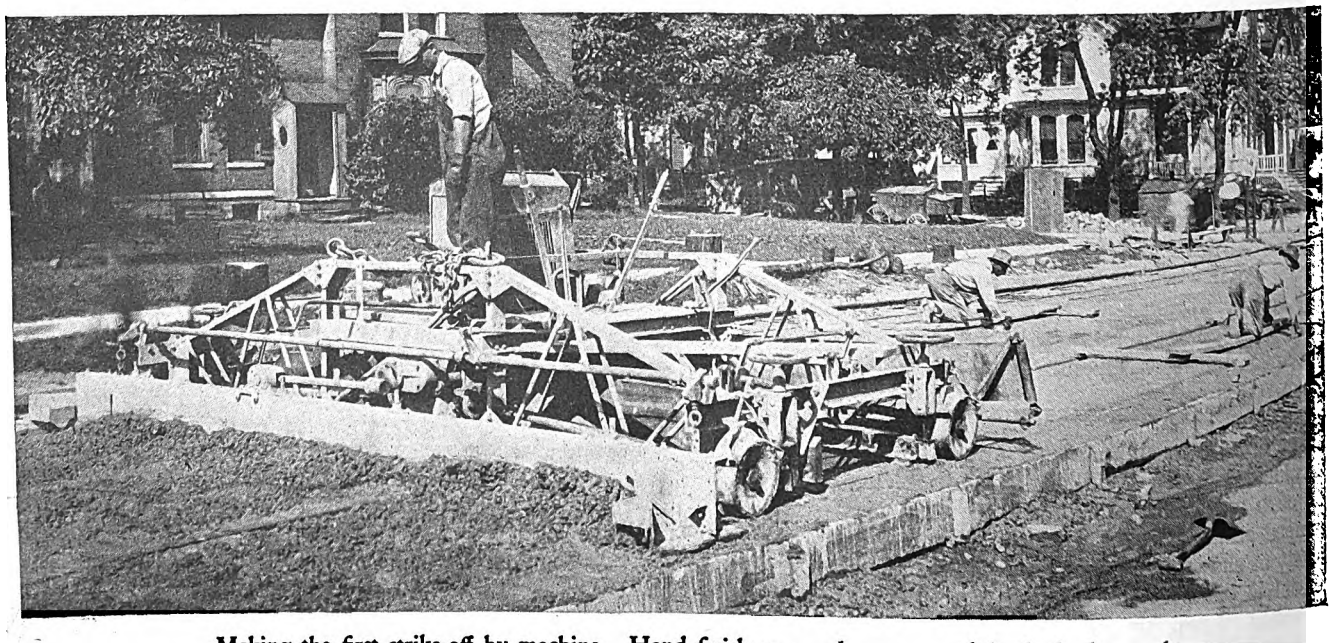
When steel tie construction is used, two men with tamping bars are added to the crew to work the concrete around the ties. When cement is handled from stock piles on the side of a street where cement skips cannot be used, an additional man is added to the crew. Our company forces lay about 700 sq.yd. of concrete pavement in eight hours. We have laid as high as 942 sq.yd. in seven hours.

Frequent Field Tests Made

Slump tests are made from time to time to check the consistency of the concrete and 6x12 in. compression test cylinders are molded to check the strength and to determine the length of time required before the pavement is to be opened to traffic. We are working on a method of making strength tests in the field by the use of a simple device for breaking small cantilever beams. These tests are to be conducted day by day, and as soon as sufficient strength is shown by the test specimens, the street will be opened to traffic. A check on the bulking of sand is made by inundating a small sample in a graduated cylinder. An accompanying illustration shows a typical cross-section of standard track construction using concrete pavement. Formerly we used a $\frac{5}{16}$x2-in. flat tierod with 1-in. round terminals which had a marked tendency to crack



T. M. E. R. & L. Company placed a total of 343,014 sq.yd. of concrete pavement in its track zones during the past nine years



Making the first strike-off by machine. Hand finishers are shown at work in the background

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the pavement. Last year 1-in. round tierods were substituted, materially reducing this cracking.

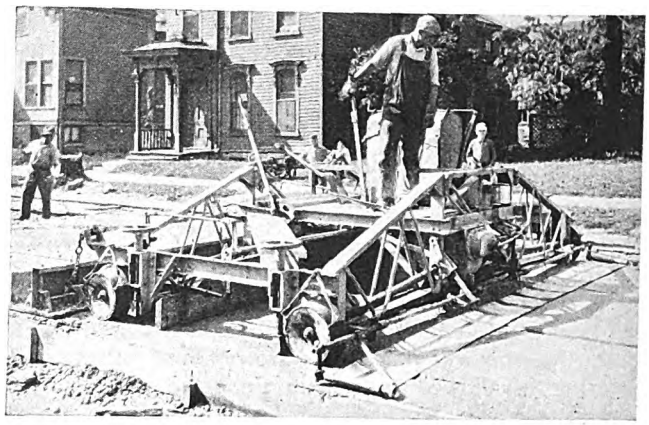
At all street crossings, except in the outlying districts, granite block stretchers are employed along the gage side of the rail for the full street width, to reduce the width of the throatway and to provide a smooth intersection. The throatway width is reduced from 5 in. to 2¼ in. The granite blocks have a greater resistance to crushing than concrete and their use at street crossings adds substantially to the life of the pavement. In placing the concrete pavement, forms are set to provide proper space for the blocks which are later laid on a 1:3 cement-sand cushion and set in a 1:1 cement-sand grout. Where cross street traffic is exceptionally heavy, the entire width of the track zone is paved with granite block pavement.

For the last few years we have been using 2½ lb. of granulated magnesium free calcium chloride per square yard for curing. This material is uniformly spread over the surface of the pavement with a mechanical spreader. If rain falls within four hours after the application of the calcium chloride, a second treatment is required.

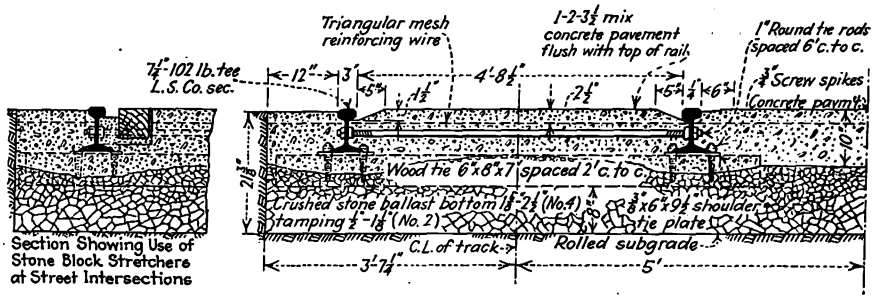
It occasionally becomes necessary to arrange to open the concrete pavement to traffic in a relatively short time and these special conditions are met as follows: If the pavement is to be opened in 24 hours, Lumnite cement is used. If the pavement is to be opened in two to three days, a choice of two methods is available: The use of so-called high-early-strength cement; or a richer mix with a low water-cement ratio. In the second method, increasing the mixing time and the addition of 2 lb. of flaked calcium chloride in solution will aid materially in obtaining desired results.

When it becomes necessary to lay concrete in freezing weather careful consideration is given to the following details: Subgrade must not be frozen; materials must be heated; hot water must be used in mixing concrete; mix is kept as dry as possible; 2 lb. of magnesium free flaked calcium chloride is used in solution to each bag of cement, and sufficient covering is used to protect the pavement from freezing.

The subgrade is protected against freezing, and with crushed stone ballast this is relatively easy. Gravel is avoided as a coarse aggregate during the winter months as it holds a high percentage of moisture and requires considerable heating before it can be used. Crushed stone is therefore substituted. The crushed limestone and sand are heated over old pipes, or when sufficient drier capacity is available, sand may be dried and heated at the sand drier plant. We have also made use of a hot mixer for laying asphalt pavements to heat the aggregates in cold weather. A sprinkler car is used for transporting hot water. This car is switched into the shops and a steam line run into the tank during the night-time. In the morning a portable boiler mounted on a small flat car is attached and the two are taken to the job where a steam line is run from the boiler to the line carrying the water from the car to the mixer. Air pressure is maintained on the tank to run the water into the mixer. A



Making the second strike-off, tapping, cutting throatway, and belting—four operations handled simultaneously by the same machine



Cross-section of standard track construction in Milwaukee. Wood ties are used with crushed stone ballast, and concrete pavement reinforced with standard wire mesh. The small cross-section at the left shows the stone block stretcher used at street intersections

T. M. E. R. & L. Company's standard 10-in. concrete pavement. It will be noticed that the crossing is of all-granite construction

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saturated solution of calcium chloride is prepared and one quart of this solution contains approximately 1 lb. of calcium chloride, which is added to the mixing water. By the use of heated aggregates and hot water, a hot mixture is obtained. The calcium chloride solution produces a quicker set and allows the finishing operations to be completed and the covering placed long before there is any danger of freezing.

For covering we lay two-by-fours, 18 ft. long, across the track, blocked up on the rails to keep them off the fresh concrete. Over these supports canvas is placed and then a substantial covering of marsh hay. After 24 hours the supports and canvas are removed but the hay covering is allowed to remain until the pavement is opened to traffic.

Our oldest concrete pavements are down nine years, and so far we have had little maintenance expense. Transverse cracks occur at short intervals, usually over a tierod. In filling them, a truck filled with dry sand, asphalt and fuel is used to tow an air compressor and a tar kettle. The cracks are cleaned out by compressed air, filled with hot Texaco No. 96 asphalt and covered with dry sand. The following constitute the crew: One man cleaning out cracks, two men filling cracks with asphalt, two men sanding cracks, one equipment operator and one truck driver.

The accompanying graph indicates by years the yardage of concrete pavement installed up to and including 1927. It is estimated that approximately 61,500 sq.yd. will be laid in 1928. Starting with 9,000 sq.yd. in 1919, a maximum of 61,860 sy.yd. was laid in one year, in 1925, and a total of 343,014 sq.yd. in nine years.

The advantages gained through the use of concrete pavement in our track zone prompt the following conclusions:

1. Concrete pavement aids materially in holding track to line and surface and thus substantially increases its life. Loads from street traffic are uniformly distributed over the subgrade.
2. Concrete pavement can be successfully laid by company forces.
3. Concrete pavement in track zone provides a smooth surface for street traffic, equally acceptable to the abutting property owners and the drivers of pleasure cars and trucks, and it has won the approval of city officials in all municipalities in which we operate.

Milwaukee originally required the track zones to be paved with the same materials used by the city in paving the rest of the street. In November, 1923, an ordinance was passed by unanimous vote of the Council, permitting the company to install concrete pavement in its track zone in lieu of all other types. This approval has stimulated the development of equipment and control methods to the end that tracks may now be paved expeditiously and with high-grade concrete pavement.

Babbitt Room Modernized with Electrical Equipment

Bearings are boiled in Oakite, after which old babbitt is removed and new babbitt is cast with aid of thermostatically controlled melting pots

BEARINGS of the Los Angeles Railway, both armature and axle, are rebabbitted in an electrically operated babbitt room which is an example of cleanliness and efficiency. Electrically operated pots and a preheating cabinet located in the room are thermostatically controlled, resulting in a uniform pour of metal. In addition to the three pots and the preheating cabinet there is also an electrically operated Oakite boiling vat. This room is an example of the modernization of the South Park shops which has been steadily going on with a view toward making a clean, efficient plant. The appearance of the babbitt room resembles that of a bakery, with its white enameled ovens and orderly appearance of bearing shells and materials. The equipment is also painted white, contrasting with the electric switches on panelboards mounted around the room.

Old bearings received from the division shops are first placed in the Oakite vat, where they are boiled to remove all dirt and grease. This vat is at one end of the table of pots and furnace. The bearing is next placed in the first of the three electric melting pots, where it is heated to between 700 and 800 deg. F. until the old babbitt is removed. Each pot has a capacity of 650 lb. of babbitt. It is set below the surface of the metal table, the heating elements being in a cabinet underneath. The control panel, on which are mounted switches, pyrometer and control unit, is mounted back of each pot.

Cleaned shells removed from the melting pot may follow either one of two courses. If they are to be rebabbitted immediately they are placed around the melting pot so that their temperature will be maintained. Otherwise they are placed in the preheating oven, which is located on the bench between babbitt pots Nos. 2 and 3. This is an airtight oven, electrically heated to between 175 and 200 deg. F. This cabinet measures approximately 24 x 30 in. It occupies one section of the bench.

If either course is followed the shafts are at a temperature of around 200 deg., which permits pouring. Babbitt pots Nos. 2 and 3 are used for pouring. No preparation is made of the iron shells, as they have anchor lugs which hold the babbitt in place. In the case of brass shells, the inside is swabbed with an acid cleaning flux of zinc chloride.

Various types of mandrels and forms are used. With split armature and axle bearings, a clamp is used to hold the form to the split mandrel. The clamp consists of a piece of ½-in. round steel formed to a wishbone shape with one arm extended. This extended end of the clamp is threaded and passed through a lug fastened to the back of the split mandrel. A spring and nut set the tension on the clamp so that when it is swung into position it holds the form against the mandrel. This is shown in an accompanying illustration as applied to a split armature bearing. An example of the work done

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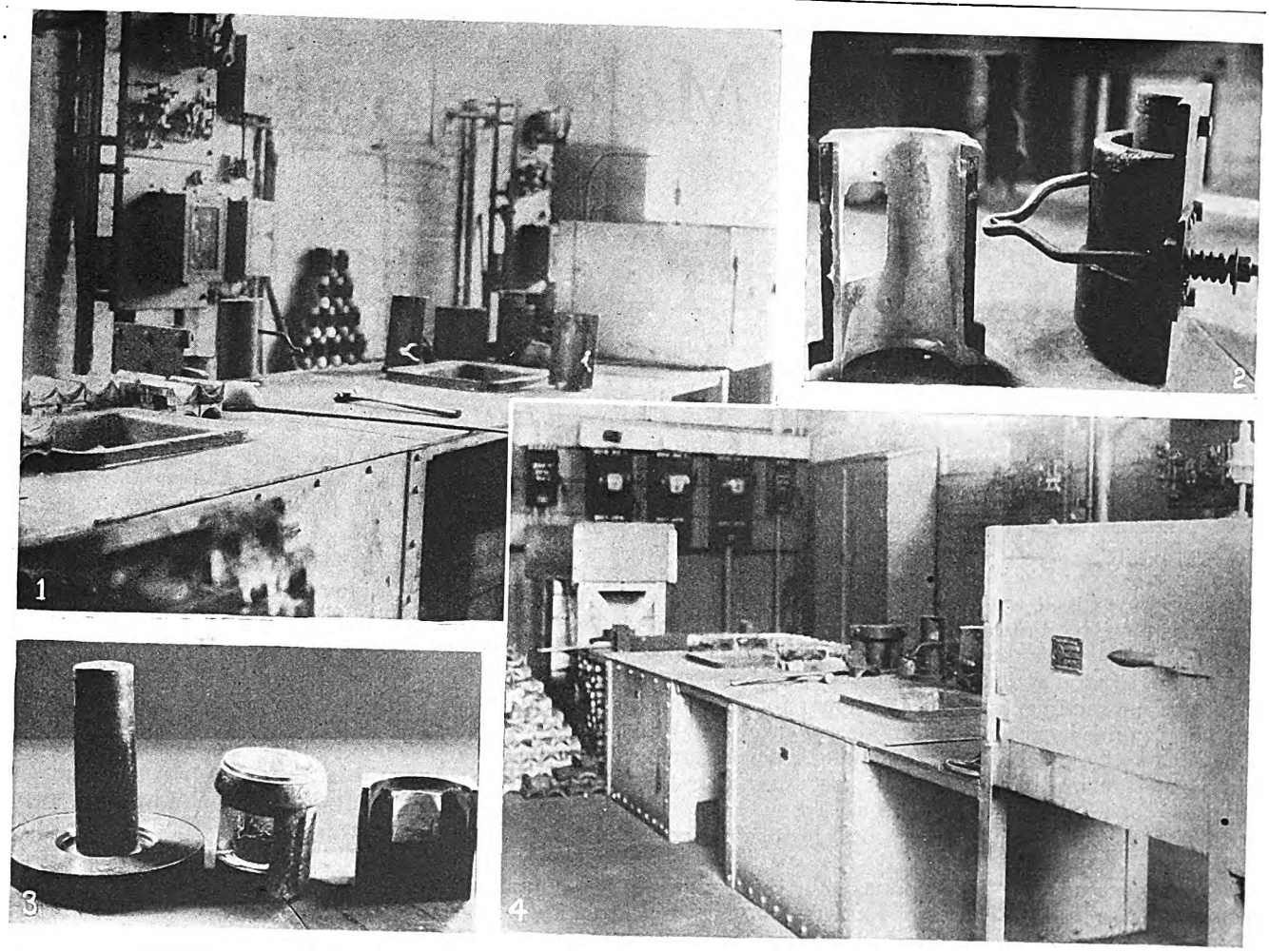

Poured bearings before being sent to the machine shop are cleaned by a mechanic in a wire semi-inclosed portion of the workbench

Nos. 1 and 4. Two views of the electrically operated and controlled babbitt pot, preheating furnace and Oakite cleaning vat which are features of a babbitt room which is noteworthy for its cleanliness and orderly appearance. It has an output with one man and helper of approximately 2,500 lb. of babbitt per day for bearings of the Los Angeles Railway.

No. 2. A split mandrel, form and wishbone clamp used for pouring split armature and axle bearings. An unfinished poured bearing is shown at the left.

No. 3. Solid bearings are poured around the mandrel with grooved face.

in this manner is shown in the same illustration by a split axle bearing which has been cast in a larger form than that used for the split armature bearing.

Solid armature bearings are cast around a mandrel which has several grooves in the base to furnish the necessary collar of the bearing to take up end play between the armature and case. The form used to block out the window in the bearing is at the extreme right in the illustration which also shows the mandrel and finished bearing.

In pouring bearings use is made of a self-skimming ladle. After a bearing is poured there is little work to be done on it other than to clean up the edges. A mechanic working in a screened portion of the workbench chips off the superfluous metal, thus preparing the bearing for the finishing. An axle bearing with a diameter of 4½ in. has enough metal left on it for a $\frac{3}{32}$-in. lathe cut for finishing.

With this electrical equipment, the orderly arrangement and utilization of the space in the babbitt room, one operator with a helper can pour approximately 2,500 lb. of babbitt per working day. By arranging the equipment in such a manner that a bearing passes from one process to the next without unnecessary handling, much time is saved.

Accident Information Presented Effectively

ENLISTING the interest of trainmen in accident prevention and the proper preparation of accident reports has been done on the Sacramento Street Railway by a novel method. This was described by S. B. Elmore, assistant superintendent of the company in a paper read before the California Electric Railway Association at the meeting held in San Francisco.

Trainmen's meetings lasting one hour are held monthly at the carhouse at which time one or more of the serious accidents of the previous month are discussed in detail. The report of the accident as turned in by the trainmen is first presented, after which are given excerpts from the statements of witnesses as secured by the company's investigator. Progress of negotiations leading up to the settlement, if one has been effected, are then disclosed. The actual names of interested parties are usually withheld. The trainmen take a keen interest in this method of presentation and the result has been reflected in more care in running the cars and in preparing accident reports, and a record of fewer chargeable accidents in operation.

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Engineers Make Suggestions for Track and Line

EXPERIENCE shows that maintenance equipment is unsatisfactory in certain respects for the process of modernization now going forward on electric railway properties. To raise the standard of the maintenance work and permit more economical methods, many improved tools are needed. Prominent men in the industry have recognized this need. To start a campaign for better tools the new executive committee of the American Electric Railway Engineering Association, at its Cleveland meeting, outlined a program for focussing attention on this important subject. It was suggested that this situation be called to the attention of manufacturers through action by the maintenance men themselves in pointing out what new devices are needed and improvements that should be made in available maintenance equipment.

An announcement of the action taken by the executive committee was made in ELECTRIC RAILWAY JOURNAL for Oct. 27, and suggestions were asked for improving machines and equipment for the maintenance of cars, buses, track and line. In answer to this request several engineers have suggested some of the equipment that is needed, particularly for track and line work. These suggestions are published in this article and it is hoped that they will stimulate others to send in their ideas.

ELECTRIC RAILWAY JOURNAL takes this means of co-operating in the program proposed by the executive committee and offers its pages as a clearing house of ideas for improved equipment. We ask that all men who have experienced difficulty in any line of maintenance work send in their suggestions concerning the kind of equipment that will help them. What improvements are needed most? By co-operation of the men actually confronted with these problems, the limitations of present shop, track and line maintenance equipment can be brought forcibly to the attention of interested manufacturers. Suggestions will be published in these columns, and all maintenance men should enter this discussion.

Manufacturers also are urged to enter the discussion, to tell why some of the much-needed tools are not available and to advise how some of the suggestions can be carried out to best advantage. Letters are requested from all those who have suggestions to make regarding needed imrovements in existing equipment or new devices that should be brought out.

Better Wire Stringing Equipment, Electric Hammers and Square Threads on Turnbuckle Screws Needed

Suggestions by F. MCVITTIE
Electrical Engineer New York State Railways
Rochester, N. Y.

REGARDING suggestions for equipment that will provide better, quicker, and less expensive maintenance, I believe that some machine or device can be developed to string new trolley wire and take down the old in one operation. It should be designed so that the new wire can be strung to its proper tension and hung in, and the old wire can be taken down at the same time without letting it down on the ground. The methods now generally used are somewhat cumbersome, and present-day traffic introduces many hazards that may result in serious accident.

600-VOLT ELECTRIC TOOLS NEEDED

Another device that could be used to very good advantage is an electric hammer, somewhat similar to a pneumatic hammer, that would operate directly from the 600-volt trolley. It should be self-contained and reasonably light. It could be used to very good advantage for digging holes to set poles, as it would do away with the use of long digging bars where the holes are in dirt or clay, and it would be extremely valuable to dig holes where concrete or rock is found.

SQUARE THREADS PREVENT TURNING

Turnbuckles of various sizes are used in trolley work, the screws of those now on the market have a standard "V" thread and, after the turnbuckles have been used under a strain the threads upset, making them useless. If turnbuckles for this class of service could be made with a square thread they would have much greater strength and would eliminate the threads turning. This would prevent the possibility of a screw stripping its thread thus allowing the trolley wire to fall into the street.

More Automatic Devices Desirable

Suggestions by HOWARD H. GEORGE
Superintendent of Research Cleveland Railway,
Cleveland, Ohio

IT IS with the idea of stimulating a greater interest among electric railway engineers in the announcement which appeared in ELECTRIC RAILWAY JOURNAL of Oct. 27, asking for suggestions for better machinery for the various maintenance operations on our electric railway systems, that I wish first to congratulate the management of the publication for the prompt action taken on the suggestion of the American Electric Railway Engineering Association executive committee on this matter.

As one of the judges in the Mainte-

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Improving Maintenance Tools

nance Contest, I have been impressed very strongly by the comparatively large number of home-made devices that have been developed on different properties for practically the same identical operation. Certainly, one of these devices must possess certain merits which the others do not have; one must be more efficient than the others; and, if there is a real need for such machines or devices in one place, there must exist similar needs in many other places. By the same token, if such home-made devices were taken up by a commercial manufacturer and some research development work done on them, there is not much doubt but that a still further improvement in the labor-saving possibilities would result and a machine produced which would be equally applicable on many properties.

On the other hand, there are certain fields which apparently our machinery designers have feared to experiment in. I have in mind two machines which will prove of value.

Automatic Welding of Rail Joints

The human element is a very important factor in the success or failure of arc-welded rail joints. Automatic welding has been developed for other purposes and has not only increased the speed of welding but has vastly improved the uniformity of the product. It is my belief that there would be a big field for an automatic machine for welding rail joints, and one which will justify considerable development work on the part of welding machine manufacturers.

Use Circular Saw for Cutting Rails

There is, so far as I know, no very satisfactory portable machine on the market for cutting rails in the field which does not make it necessary to tear out a considerable amount of pavement and excavate below the rail base in order to permit its operation. These present machines are, I believe, all reciprocating in their action and make use of saw blades, which process is naturally slow. It has for many years been my thought that a machine might be developed for cutting rails in the street which would enable the cut to be made by feeding a circular saw downwards into the rail and so on through the entire rail, which, by reason of its higher speed, would make the cut much more rapidly. I believe this type of machine, if it can be developed, would find a ready market, provided its cost were not prohibitive.

There are, no doubt, many other ideas which this request will bring out, and it is to be hoped that from the suggestions thus made many pieces of equipment of real value to the industry will be developed.

Manufacturers

What have you to say regarding the suggestions for improved equipment made on these pages?

SEND IN YOUR COMMENTS

Tools Needed to Permit Track Repairs Without Removing Pavement

Suggestions by E. M. T. RYDER
Way Engineer Third Avenue Railway, New York, N. Y.

AS SUGGESTIONS for improved equipment in connection with the campaign of co-operation with the electric railway industry and equipment manufacturers looking toward the development of new tools for shop track and overhead departments, I would like to propose two way department items for consideration.

Track Drills With Pavement Clearance

There are on the market efficient electric power track drills but none of them, as far as the writer knows, are designed to operate on paved track without requiring the removal of a considerable amount of pavement at the point of operation. It is suggested that a drill should be designed having the underside of the frame 2 in. above the level of the head of the tram rail with the motor mounted above the frame, possibly mounting it so as to operate directly on a vertical shaft. The lower end of the operating shaft should be kept as close to the rail as possible, using a special short bit and driving it through beveled gears. Such an arrangement would save a good deal of expense, as the item of removing and restoring pavement is a very considerable part of the cost of making joint repairs. If designed to work within 8 in. of the rail such a drill would be of especial value on elevated railways, where an inside guard rail is in use on straight track.

Rail Grinder Designed for Transverse Power Derailing

In order to speed up the grinding of joints and corrugations heavy equipment is necessary, and recently such grinding equipment has been mounted on service cars permitting the grinding of both rails at once. The use of such equipment, however, is limited much by the necessity of running to crossovers to keep out of the way of regular cars. A short wheelbase heavy truck derailing transversely in a few seconds time seems to offer promise of filling a notable want. The cause and relief of corrugation is an ever-present problem which has not been solved satisfactorily. Apparently there is to be a steady field for grinding, and the type of equipment suggested seems to offer a decided improvement over any existing types.

Operating Men

We want your suggestions for improving maintenance tools—What new equipment do you find particular need for?

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Maintenance of
Automatic Substations

A competent crew of maintenance men should be divided into groups for inspection and for maintenance work. Value of proper forms in simplifying work

By M. J. Adams
Switchboard Engineer Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

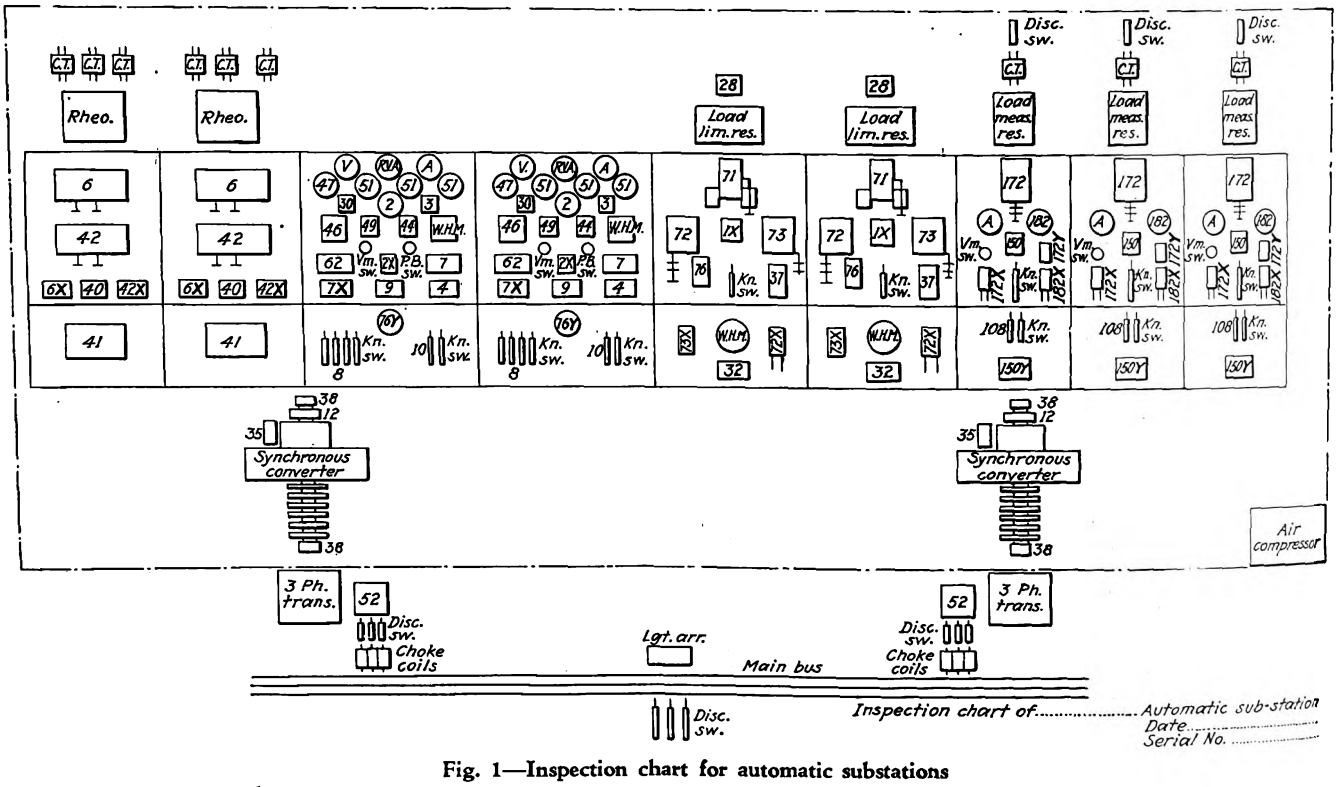

Fig. 1—Inspection chart for automatic substations

AUTOMATIC substations have brought about a change in maintenance and maintenance methods. The work has become more or less specialized and a different type of men is required to care for this type of station. The amount of maintenance and inspection necessary to keep the equipment in proper operating condition varies with the type of equipment and the application, as well as local conditions. It is quite obvious that a hydro-electric station located away from the dirt of the city will not require nearly as much cleaning and blowing out as a railway converter station located on a busy street in the heart of a city. It is also evident that the more complicated stations will require more maintenance work than the simpler type.

This article is based upon maintenance experience in railway converter stations, and all charts and schedules cover this type of equipment. Assume that the operating company has a competent crew of maintenance men, well versed in general maintenance practices and thoroughly familiar with the sequence of operation of the stations placed in their care. These men may be broken up into two groups, the inspectors and the regular maintenance crew. The inspectors should be men who have proved themselves especially adept at working out the causes of trouble and visualizing the conditions which could produce the troubles which they are to locate and cure. The inspector should visit the stations every two or three days, depending upon the severity of service, and make a casual inspection of the equipment, which should consist of reading meters, taking readings on operation indicators, checking oil levels and giving the station a visual check throughout. The inspector should also be charged with the investigation of any troubles which may arise in the operation and should have com-

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plete charge of the testing and calibrating of all protective devices.

The maintenance crew should consist of trained maintenance men and helpers, working in pairs, the maintenance man doing all the inspecting and adjusting, the helper handling the air hose and taking care of the brushes and wiping down the equipment. The frequency with which this maintenance crew visits the stations will depend entirely upon how severe the service on the station is and also upon the local conditions regarding dust and dirt. In general, however, it is found that a thorough blowing out and cleaning up accompanied by a general inspection about every two weeks is sufficient. It must be understood, however, that this is only a general average and that this amount of work must be increased or decreased according to the needs of the individual installation.

The type of inspection reports and charts varies with the individual operating company, but in general they all follow along the same lines. There are two general forms of inspection charts in common use. One is merely a numerical list of the devices, with suitable blank spaces, to be filled in by the workmen. This report is very much in detail and calls for answers of the "Yes" and "No" variety and has a slight tendency to destroy the individuality of the maintenance man. In general, it is better to let the maintenance man use his own judgement as to cotter pins, contacts and general mechanical conditions of the various devices. Another disadvantage in this report is that with the various devices listed in numerical order it means that to follow the report down from top to bottom the maintenance man must keep moving from one piece of equipment to another numerically and not according to physical location, and unless the report is followed very closely some piece of apparatus may be missed.

The type of inspection report or chart shown in Fig. 1 consists of a general plan of the substation with the switchboard placed flat on the floor. All pieces of equipment are shown in their relative positions by small numbered squares, therefore the inspector or maintenance man using this chart may start in at one end of the switchboard and check each panel as he goes. A common practice is to have the maintenance men use different colored pencils in checking off the equipment which they have inspected and cleaned. In this manner if one man checks a certain panel upon which trouble is found later, he can be held accountable for not having discovered and eliminated the trouble on his previous inspection. This type of chart is also useful in that the superintendent of substations can pick out the devices that have caused trouble at a glance, as trouble is indicated by a "T" placed in the square representing the device. If the inspector or maintenance man has checked the device and found it to be O.K. he indicates this by a check mark in the square, but if he finds that there is trouble in this particular piece of apparatus he places a "T" in the square and turns the inspection report over, indicates on the back the device number and describes the nature of the trouble and what was done to remedy it. This makes a quick and convenient method of locating troubles on the chart and does not necessitate the reading of all of the details.

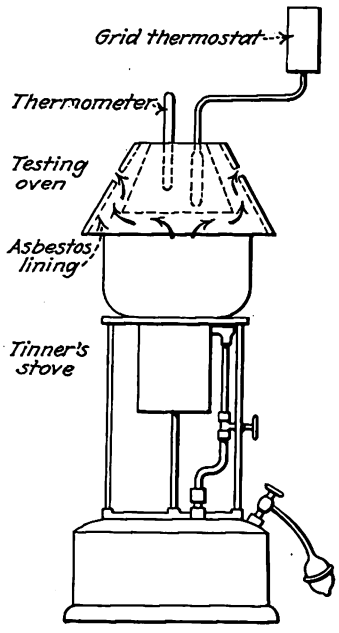
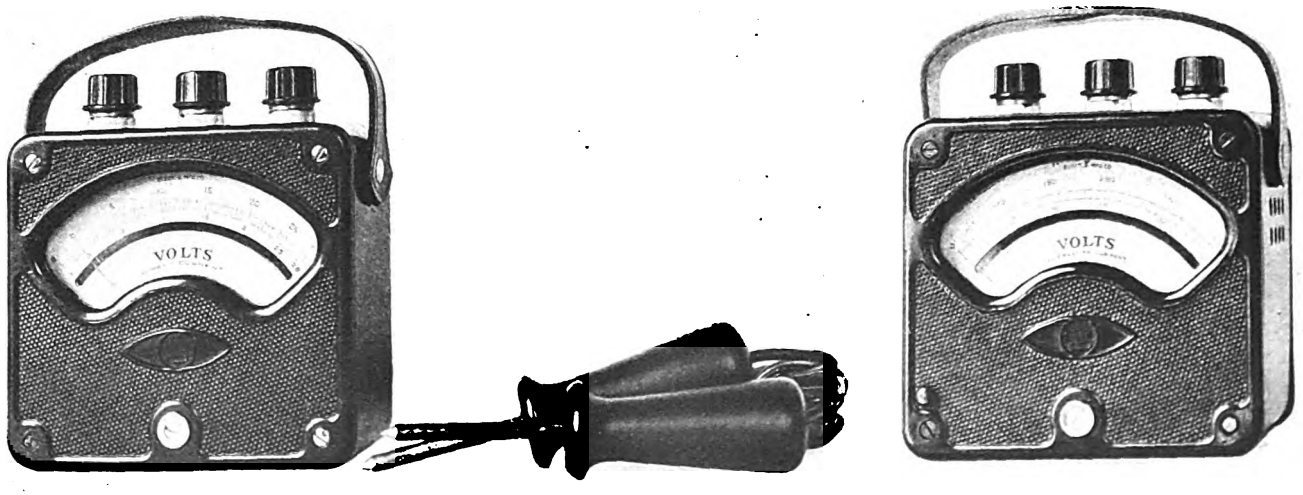


Fig. 2—Oven for testing grid thermostats

It is impossible to give any definite instructions regarding the amount of maintenance work necessary to keep a chain of automatic substations in the proper operating condition, as the quantity of the work is entirely dependent upon the severity of service to which the equipment is subjected and also upon the local conditions regarding dirt, dust, dampness, etc. However, it will be found after six or eight months' experience in caring for a chain of automatic stations just how much individual maintenance each station will require and a schedule may be arranged accordingly.

In addition to the regular maintenance work consisting of inspecting, cleaning and blowing out, there is also a



At left, direct current volt-ammeter. At right, triple-scale alternating current voltmeter

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certain amount of routine testing and inspection that should be laid out and followed carefully over each year's period of operation. This type of work consists of testing and calibrating the various protective devices and maintaining and inspecting bearings and testing transformer oil. A sample schedule for work of this kind is given herewith, and while it must be understood that this schedule will not apply to all installations it nevertheless can be used as a basis for a testing program.

Detail Inspection of Rotary Substations

.....Automatic Substation Date.....
Inspection Started.....A.M. Inspection Finished.....P.M.

No. 1 *Master Element D.C. Undervoltage Relay.*
Contacts.....Mech. Oper. .....Fuse Unblown.....

No. 2 *Time Delay Starting Relay.* Contacts .....
Mech. Oper. .....Time Setting.....

No. 3 *Master Relay.* Series Resistors.....
Mech. Oper. .....Contacts.....

No. 4 *Master Contactor or Controller.* Contacts.....
Mech. Oper. .....

No. 6 *Starting Contactor.* Main contacts are.....
Mech. Oper. .....Interlock contacts are.....
Interlock bind.....Lubrication of interlock.....

No. 6X *Starting Contactor Control Relay.* Contacts.....
Mech. Oper. .....

No. 7 *Polarized Motor Relay.* Contacts "A".....
Contacts "B".....Contacts "D".....
Mech. Oper. spin motor and rotate drum.....
Lubrication, gears and bearings.....

No. 7X *Polarized Motor Auxiliary Relay.* Contacts.....
Mech. Oper. .....

No. 9 *Field Reversing Relay.* Contacts.....Mech. Oper.....

No. 12 *Overspeed Limit Device.* Does device shut station down
.....Contacts.....Mechanical Operation.....

No. 28 *Resistor Thermal Relay.* Contacts.....Mech. Oper.....
Do contacts reset properly..Does relay operate properly..

No. 30 *Annunciator Lockout Relay.* Contacts.....
Targets .....Mech. Oper. .....

No. 32 *D.C. Reverse Current Relay.* Mechanical Operation.....
Contacts .....Does relay shut station down.....

No. 35 *Brush Lifting Device.* Contacts.....Contactor.....
Do they make and break properly.....Do they lift and seat properly.....Oil in gear case.....
Grease on exposed gears .....

No. 37 *Undercurrent Relay.* Drop out valve (approx.).....
Contacts .....Mech. Oper. .....

No. 38 *Bearing Thermal Relay.* Do contacts lockout station
.....Mech. Oper. .....

No. 40 *A.C. Machine Field Relay.* Contacts....Mech. Oper....

No. 41 *Field Contactor.* Upper contacts.....Lower contacts .....Mech. Oper .....

No. 42 *Running Contactor.* Main contacts are.....
Interlock contacts are.....Interlock bind.....
Lubrication of interlock.....Mech. Oper. .....

No. 42X *Running Contactor Control Relay.* Contacts.....
Mech. Oper. .....

No. 46 *Reverse Phase or Phase Balance Current Relays.* Contacts.....Do relays shut station down while in normal running position.....Does relay lockout the station if it operates while machine is starting.....

No. 47 *Single or Reverse Phase Voltage Relay.* Mechanical Operation.....Will phase failure operate relay. (Remove pot. tranf. fuses).....
Does relay shut station down.....Contacts.....

No. 49 *A.C. Thermal Relay.* Does relay shut station down.....
Mechanical Operation.....Contacts .....

No. 51 *A.C. Overcurrent Relays.* Do relays lockout the station
.....Contacts .....Mechanical Operation.....

No. 52 *Oil Circuit Breaker and Mechanism.* Oil tested.....
Oil level .....Main contacts clear.....
Make good contact.....Do auxiliary switches make and break correctly.....Low volt. mech. .....

No. 62 *Time Delay Stopping Relay.* Contacts "S".....
Contacts "T".....Mech. Oper. spin motor and rotate drum .....Lubrication.....

No. 71 *D.C. Emergency Circuit Breaker.* Contacts.....
Mech. Oper. .....

No. 71Z *Flashover Relays.* Do contacts lockout station.....
Mech. Oper. .....

No. 72 *D.C. Contactors.* Contacts.....Mech. Oper.....

No. 73 *Load Limiting Resistor Shunting Contactors.* Contacts
.....Mech. Oper. .....

No. 76 *Overcurrent Relays.* Contacts.....Mech. Oper. .....

No. — *Synchronous Converter.* Pilot Brushes.....
A.C. Brushes.....D.C. Brushes.....Commutator
.....Commutation.....Slip Rings .....
Bearings.....Connections.....Is machine clean.....

No. — *Power Transformers.* Oil clear.....Level correct.....Connections .....

No. — *Operating Transformers.* Oil clear.....Level correct.....Connections .....Fuses.....

No. — *Potential Transformers.* Connections tight...Fuses....

No. — *Current Transformers.* Connections tight.....

No. 150 *Short Circuit Selective Relay* (Title for both 150 & 150Y).
Contacts.....Mech. Oper. .....

No. 150Y *Arc Bearings Free.* Contacts.....Mech. Oper.....

No. 172 *Feeder Contactor.* Contacts .....
Mech. Oper. .....Interlocks .....

No. 172X *Feeder Contactor, Auxiliary Relay.* Contacts.....
Mech. Oper. .....

No. 172Y *Feeder Contactor, Auxiliary Relay.* Contacts.....
Mech. Oper. .....

No. 182 *D.C. Reclosing Relay.* Contacts.....Mech. Oper.....

No. 182X *D.C. Reclosing Relay, Auxiliary Relay.* Contacts.....
Mech. Oper. .....

Schedule for Routine Testing and Inspection

D.C. Reverse Current Relays, A.C. Reverse Power and Machine Overspeed.—Test and calibrate every six months.

D.C. Overload, A.C. Reverse Phase and Low Voltage.—Test and calibrate every six months.

Bearings of Converters and Auxiliary Rotating Equipment.—Change oil and flush reservoirs every six months. Take out and inspect converter and motor generator, set bearings once a year and touch up spots that show signs of slipping or cutting.

Transformer Oil.—Samples of oil from the oil insulated transformers should be taken every six months and tested for dielectric strength by actual test with an oil testing transformer. If the oil tests are low it should either be changed at once or else run through a dehydrating machine.

Oil in Oil Breakers.—The amount of attention which the oil breakers in a station require is solely dependent upon the number of operations per day and the severity of the loads which they interrupt. For that reason no hard and fast rule can be applied to the number of inspections required. In general, however, the oil should be changed and the contacts inspected and adjusted every three to six months. In case the breaker does not perform very many operations it is often possible to extend this period considerably but this can be proved only by experience.

Thermostats, Grid Resistance and Bearing.—Bearing thermostats since they operate around 100 deg. C. are tested very easily by placing them in a deep pot of oil heated by a Bunsen burner or tinner's furnace. Grid thermostats, however, present a different problem as their operating temperature is usually around 300 deg. C. This prohibits the use of oil as it will boil below that temperature. However, a very inexpensive furnace for testing these thermostats may be made similar to that shown in Fig. 2.

This oven consists merely of a heavy sheet iron cone lined with asbestos and designed to fit over the top of an ordinary tinner's stove. Suspended from the closed top of this cone is another sheet iron cone of smaller dimensions which forms a chamber for heating up the bulb of the grid thermostat and at the same time keeps it away from the direct flame of the tinner's stove. Small openings are left in the outside cone to carry away the flame and gases. The inner chamber maintains practically an even temperature all over so that readings obtained from the thermometer will be equivalent to the temperature to which the grid thermostat bulb is subjected. The grid thermostats and bearing thermostats are probably the most abused of any of the protective devices in an automatic substation, in that, due to the difficulty in testing them, inspectors and maintenance men often allow them to remain in an improperly calibrated condition without ever being aware that they are out of calibration. For this reason they should be tested at least every six months in order to insure the safeguarding of the machine bearings and the load-limiting resistors.

Feeder Resistance Measuring Relays.—In most applications it is sufficient to check the calibration of these relays every six months. This work is commonly done by the use of a resistance capable of carrying the measuring current and equal to the resistance of the load upon which it is desired to reclose.

The remaining protective devices can be checked during the general inspection and clean-up period and no special time for this work is necessary.

Insulation tests should be made on the station equipment every six months. By insulation test it is meant that all control wiring, all high-tension bus work, and all electrical apparatus should be subjected to an insulation test with a megger. In addition, on all 600-volt installations the switchboard risers and supports should be tested for grounds and also for potential. The same applies to the cast-iron framework which supports the grid resistors. Occasionally a bank of grid resistors will be found which has broken down its insulation and has placed potential on the cast-iron end frames. This condition is very dangerous as workmen may accidentally ground these end frames and cause a bad burn-out.

The subjecting of the control wiring to an insulation test often discloses some peculiar condition which would not have been discovered except through the medium of serious trouble. The use of a megger on the control wiring will often disclose minor grounds caused by collections of copper and carbon along wiring and equipment which in its present state could cause no trouble but might at some future time develop into an arcing ground

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or short which would cause serious damage. When these faults in control wiring show up an elimination process should be started by taking off connections and progressing slowly down the control wiring until the fault is located. This can be accomplished by following the schematic diagram and checking off the points as they are disconnected and cleared.

It is essential that the inspectors and maintenance men be supplied with the proper instruments if they are to find troubles quickly and adjust the various relays properly. For this purpose a set of meters similar to those shown are useful. These meters are very compact and may readily be carried in a small leather carrying case. One is a d.c. volt-ammeter with the following ranges: 0-15, 0-150 volts with external resistor for 600 volts, and 0-3, 0-15 amp. The other is a triple scale a.c. voltmeter 0-150, 0-300 and 0-600 a.c. volts. Instruments of this kind can be carried easily from station to station and will always be available for testing and inspection work. Furthermore, the fact that the maintenance men have these instruments available will lead them to investigate immediately any condition which may not seem exactly right to them, while if it is necessary to secure the proper instruments from headquarters the chances are that it will be postponed until forgotten.

Automatic substation maintenance should be judged not so much by the quantity as by the quality of the work. The maintenance man who understands his station perfectly and understands the characteristics of each individual relay will discover troubles while cleaning up the station that the average maintenance man will pass over without notice. With this in mind all available literature concerning the stations should be turned over to the maintenance men and frequent meetings held in which maintenance problems and methods are discussed. By bringing up new problems and new phases of the work in these meetings the men will be prevented from falling into that routine rut which transforms maintenance men from a state of creative and constructive thinking into a condition where they turn out the routine work mechanically. This condition is obtained through doing the same work day in and day out without learning anything new about the equipment or having any reason to think deeply about its operation.

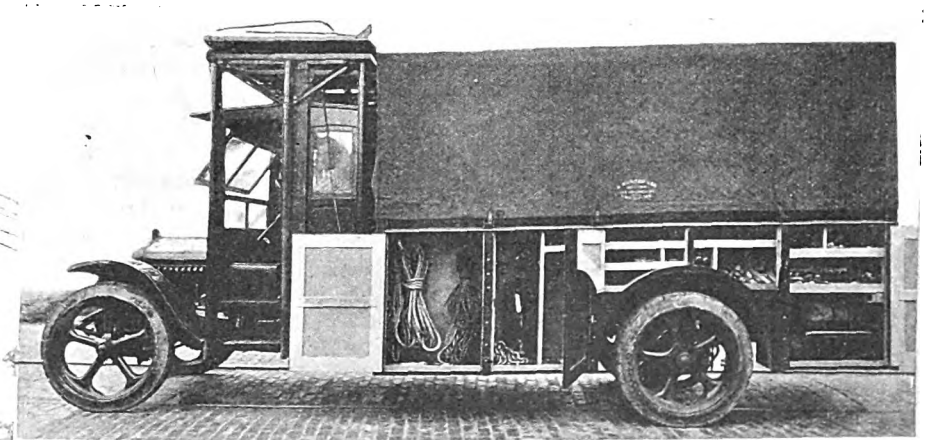
Line Truck Increases Maintenance Efficiency

IMPROVED working conditions and increased efficiency in city overhead maintenance have resulted from the use of a line truck in place of line cars on the city lines of the Chicago, North Shore & Milwaukee Railroad, Chicago, Ill. After experimenting for some time it was found that much of the city overhead maintenance could be performed during the daytime by the use of a line truck, whereas the line cars must work at night under poor working conditions.

The city systems of this railroad are equipped with direct suspension overhead trolleys while a combination of both simple and compound catenary and direct suspension is used on the interurban system. For work on the interurban system, as well as the city system, the truck is fitted for maintenance and renewal of poles and fixtures, and the stringing of small wire.

The choice of truck chassis and style of body was determined by the type of work and territory to be covered. A 2-ton, 168-in. wheelbase truck with 5-in. single-cushion tires in the front and 5-in. dual-cushion tires in the rear is used. The truck body, exclusive of the cab, is 12-ft. long and 6-ft. wide, and stands 9 ft. above the ground. The truck body contains a number of compartments for rope, chain, line tools and repair parts. The upper side frames and the rear of the truck

A light metal framework on the platform folds flat when the tower is not in use



The truck body contains a number of roomy compartments for line tools and repair parts

are covered with durable canvas curtains. Several crossbars near the roof of the body provide an out-of-the-way place for extension ladders and other cumbersome equipment.

The tower, which is a manufactured product, is a three-section, heavy-duty type with an insulated platform 56x66 in., provided with a 3 ft. collapsible pipe railing. The tower may be raised to a height of 20 ft. by a hand-operated winch. When collapsed, the total height is approximately 10 ft.

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Modern Practices in

Lubrication of Electric Railway Equipment

By H. L. Kauffman
Denver, Col.

In an article published in the Oct. 20, 1928, issue, the writer discussed the kinds and grades of lubricants suitable for use on electric railway equipment, hints on the selection of the waste used, how to saturate the waste with oil and modern practice in packing the "down-feed" motor. In this second article information is given on the lubrication of motors of recent design, on modern bearing oiling devices, and causes of bearing lubrication troubles.

IN THE so-called modern type motor there is overcome, from the lubricating viewpoint, all the inherent disadvantages of the "down-feed" motor. In this type of motor a waste well is provided with an opening in the bearing lining through which oil from the waste can reach the bearing. Adjacent to the waste well is an oil well, the two being connected by a hole at the bottom of the partition wall. In late designs the division wall between the wells is slotted throughout its length. This eliminates the possibility of closing the bottom hole with dirt or other foreign matter.

The auxiliary oil well is provided for replenishing the oil supply and for gaging its depth. This well is used when renewing the oil supply, since it conducts the oil to the bottom, from which point the capillarity of the waste is depended upon to raise the oil to the bearing. This arrangement gives a more uniform oil feed and also avoids the introduction of dirt to the bearing surface. The rate of feed is influenced largely by the viscosity of the oil—the higher the viscosity, the lower the feed rate. It is very important that the grade of oil be changed with a change in the seasons, since the viscosity of car oil varies with temperature.

Before opening the cover to pack a bearing, all dirt that might fall into the bearing housing should be removed. Long-fiber all-wool yarn, being of a springy nature even after it is saturated with hot oil, is the most desirable bearing packing now obtainable. The individual pieces of yarn should be at least 12 in. long. Since the oil will climb up straight strands of the packing yarn faster than it will pass through a number of balls or wads of the packing, it is desirable that the packing be in the form of a wick in the housing and the larger the wick, the easier it will be for the oil to reach the shaft.

The pieces of packing required for the wicks for the armature bearings should be made into skein forms of sufficient length to reach from the bottom of the waste chamber up to about 6 in. above the seat for the waste chamber cover. The skeins should then be twisted about one complete turn to hold all of the strands of yarn in place and to produce a more springy wick. As many skeins as possible are packed in the waste chamber, starting at the inner end of the bearing and working outward, and allowing the upper ends of the skeins to hang out over the seat of the cover about 6 in., or enough to hold them in place.

After the wick is formed in the chamber it should be pressed over horizontally, tight against the shaft, by means of a suitable packing iron and held in place by forcing the necessary additional packing behind it. The loose upper ends of the skeins of the wick should then be folded over the other waste and tamped down tightly. Waste chambers of the axle caps should be packed in the same way as those for armature bearings. A pad of the saturated waste, large enough to fill the remainder of the waste chamber, should be placed on top of the wick to catch and hold dirt which might fall in when the bearing housing cover is opened.

When the motors are new particular care should be taken to provide the bearings with plenty of oil, but care should be taken not to flood the motor. After the motors have been "broken in" it is desirable to inspect the bearings for oil depths about every 1,200 to 1,500 miles, but the frequency of inspection depends upon the character of service and general conditions of track and equipment.

On some types of cars it is necessary for the oiler to pack the motors by feeling rather than by sight, due to the bearings being located under and close to the car floor rather than under the floor traps. In such instances, extreme care must be taken to prevent the waste from touching dirty parts of the car under the floor and so introduce dirt into the bearing.

The frame heads are provided with auxiliary oil wells for gaging and for adding oil. The maximum oil level in the bearing pocket should not be above a point ½ in. below the lower edge of the opening in the oil box casting. The minimum depth of oil should not be less than 1 in., depending on the shape and size of the waste pocket. The bearings should not be filled above the maximum depth recommended by the manufacturer or they may be flooded and the oil wasted. The supply of oil should be replenished by the time the minimum depth has been reached or the bearing may run hot. Until the amount of oil required has been determined, the depth should be gaged each day. Measurement can be made

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by means of a stick or rule placed in the auxiliary oil chambers.

If oil be added to a height above that recommended by the manufacturer, the feed to the bearing is too fast to be economical; further, it may be the cause of short circuits due to the throwing of oil on the commutator. Too low an oil level reduces the rate of feed below that required for satisfactory lubrication. The higher the lift required of the waste, the less oil it will raise. C. Bethel, in an article on packing railway motor bearings, published in the April 19, 1928, issue, states that on a 40-hp. motor, about 2½ grams of oil are fed per hour with a ½-in. lift, this dropping to 1½ grams per hour when the lift is increased to 1 in. and to ⅛ of a gram per hour with a 3-in. lift. This latter rate is considered a minimum for good lubrication.

On most railway motors of recent design, near the ends of the armature shaft just inside the bearing lining flanges are the thrust collars on which are mounted a series of oil deflectors. The oil that works past the face of the flanges is caught by these deflectors and thrown into grooves in the frame heads, whence it is conducted to drip pockets beneath the bearing. Waste should be kept in the drip pocket to absorb the excess oil. Care should be taken to repack the pocket with dry waste when old waste has become saturated. This is to prevent oil from running out of the pocket possibly entering the motor. Oil should not appear inside the motor, especially on the commutator.

The consumption of oil depends on the mileage made, the condition of the bearings and the severity of the service. The frequency of inspection can be determined best by experience on a particular line, keeping in mind that new equipment should always have careful attention. Most companies find inspection to be necessary at intervals of from ten days to three weeks. A few drops of oil may save many times their cost in babbitt at a critical time. The packing should be turned over occasionally and particular care taken to see that the lining flanges are lubricated properly. Boxes of "down-feed" motors require reoiling more frequently than do those of motors of the modern type, sometimes as often as after each 300 miles of service; in other cases, as frequently as every other day. This period can be extended and better lubrication obtained by the application of the "Rico" type oiler.

The "Rico" type of vacuum oiler was described in ELECTRIC RAILWAY JOURNAL for Oct. 29, 1921, on page 781. With this type, oil is fed to the bearing by means of a feeder wick acting alternately under the influence of capillarity and gravity. The principle employed results in supplying oil to the bearing at rates commensurate with the temperatures at which the bearing operates. This is accomplished automatically by means of the compensator. This feature is important.

The advantages of the "Rico" vacuum oiler can be summed up as follows: (1) The oil supply is contained in a sealed reservoir where no dirt, water or other foreign matter can get to it; (2) the conveyance of oil to the bearing is by the dependable action of gravity; (3) that portion of the waste in contact with the shaft or axle is always well saturated with oil; (4) the lubricating system is automatic, and (5) the lubrication film is always maintained between the bearing surfaces.

In the various types of oil-sealed housings, the oil level in the waste well is kept constant by means of an automatic feed such as that of a "chicken trough." This housing provides a large oil reservoir and keeps out dirt.

With certain types of axle caps and armature housings, where the caps and housings are not worn to the extent requiring replacement, a method has been developed of properly reforming the waste and oil chambers, by the use of a special plastic compound, for conversion to a semi-top feed principle of lubrication, effecting a path for the flow of oil from the oiler directly to the bearing.

The compound consists of a "special" powder which is mixed into a plastic form by a solution of water and flake magnesium chloride. It can be applied readily to the interior of the waste compartments and can be formed by troweling to the proper contours. The mixture requires about 24 hours to harden firmly, after which it is not affected by oil or water, and will not chip or crack. By the use of this method the size of the oil window is reduced greatly, thereby increasing the bearing surface and reducing bearing breakage.

CAUSES OF BEARING LUBRICATION TROUBLES

Proper and efficient bearing lubrication begins with the machining and grooving of the bearings. All edges must be chamfered, both to prevent scraping of the oil film and to permit of oil distribution that otherwise would be impossible. Excessive grooving increases unit pressure and results in rapid wear.

So-called bearing lubrication troubles, upon investigation, are usually found to be due to some mechanical difficulty—assuming the use of the correct grade of a suitable oil and proper saturation of the waste. For example, misalignment in reboring housings or insufficient end play may cause apparent lubrication failures. Or, the trouble may be due to such conditions as the following:

1. Distorted bearings, which are caused by forcing a bearing with too tight a fit into the housing. This condition can be guarded against by being sure that the motor turns over by hand after assembling.
2. Shifting of the bearings in the housing, caused by shearing of dowels or keys. This will prevent the window in the bearing from registering with the window in the waste well, thus shutting off the feed of oil.
3. Loose or stretched housing bolts on the split-type motors. Such a condition is the cause of a poor fit between the bearing and the housing, as a result of which the oil is permitted to escape outside the housing. Misuse of shims gives this same effect.
4. Presence of water in the waste. This may either wash the oil out of the waste or cause waste glazing, or both, depending upon the amount of water present therein.
5. Armature striking pole pieces, due to worn bearings. The life of motor and axle bearings ranges from 50,000 to 250,000 miles. For a maximum length of service it is essential that these bearings receive a sufficient and continuous supply of lubricant; that they be packed and fitted to exclude dirt and water; that they be well and properly machined on all surfaces; and that temperature changes in the bearings due to electric heating be reduced to a minimum. Under ordinary circumstances, motor bearings should be removed when the radial wear is $\frac{1}{16}$ in. to $\frac{3}{32}$ in., or when the air gap is reduced to $\frac{3}{64}$ in.

Axle-bearing wear is apt to be just as harmful as armature bearing wear, since the detrimental effects of excessive clearances are not noticed so quickly in the former as in the latter. Excessive clearances in the axle bearing cause shocks and unnecessary strains in the motor frame and in the axle caps and axle-cap bolts. Also the center to center distance between the axle and the motor shaft is increased. In consequence of this spreading of the gears, the gears and pinions rub instead of roll, and naturally, excessive wear of these parts results. Clearances should be limited to ⅛ in., though under no conditions should uneven wear of the two axle bearings be tolerated. Close attention to these bearing fits will reduce trouble in service.

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Go After a Prize in

Help Your Company to Win Maintenance Trophy to be Awarded at Next A.E.R.A. Convention

Individual Cash Prize of $200 Offered for Best Maintenance Idea of the Year

Twelve Cash Prizes to be Distributed Among Maintenance Men in Various Departments

IN ANSWER to an industry-wide expression of appreciation of the value of ELECTRIC RAILWAY JOURNAL'S maintenance contest conducted in 1927 and extended in 1928, a new series of prizes and a bigger and broader contest have been arranged through the co-operation of the American Electric Railway Association and the committee of judges, for the purpose of stimulating increased recognition of the work of the maintenance man, and raising the standards of maintenance in the local transportation industry.

ALL entries are to be made in the form of short articles describing briefly methods or devices that improve maintenance practice. These will be judged on the idea presented and its adaptability to the maintenance work of local transportation companies. Special writing ability is not necessary. It is the intention to make the prizes available to men engaged in practical maintenance work. The form of presentation will be judged only as to the clearness with which the method or device is described and illustrated, and the extent to which information is given which would be needed by other properties interested in using the idea.

THE opportunities for individual men to win cash prizes include both the capital prize of $200 and the twelve departmental prizes. The departmental prizes will be divided into three groups, as follows: (1) Four prizes of $25 each to be awarded for the best maintenance idea submitted before Jan. 15, 1929, from each of the four departments mentioned, namely, rolling stock and shops, way and structures, electrical and line, buses and garage. (2) Four prizes of $25 each for the best items submitted between Jan. 15, 1929, and April 15, 1929, divided between the four departments as before. (3) Four prizes of $25 each for the best items submitted from April 15, 1929, to July 15, 1929. Announcement of the winners of these departmental prizes will be made

Rules of the Contest—

1 The contest will be judged and the prizes awarded by a committee of the American Electric Railway Engineering Association consisting of A. T. Clark, superintendent of rolling stock and shops United Railways & Electric Company of Baltimore, chairman; Howard H. George, superintendent of research Cleveland Railway; F. McVittie, electrical engineer New York State Railways, Rochester, N. Y.; G. C. Hecker, special engineer American Electric Railway Association; Charles Gordon, editor *Electric Railway Journal*. All decisions of the judges in interpreting the conditions of the contest and in making awards will be final.

2 Any employee or official of an operating electric railway or bus company may compete for the prizes.

3 Each contestant may submit any number of items he desires, each of which will be judged separately. An individual may win several of the prizes.

4 The author does not necessarily have to be the originator of the idea, but it must be adopted and be in use on the property with which he is connected. The idea submitted may have originated on another property or may have been furnished by a manufacturer. No device or method a description of which, to the knowledge of the contestant or the judges, has been previously published will be eligible for this competition.

5 The competition is not limited to those who originated or developed the idea or apparatus described. Any employee, with the approval of the department head concerned, may submit a maintenance practice or device used on his property. More than one article covering the same device or method will not be accepted, however.

6 Where the management of a railway has a practice of requiring approval of articles sent out for publication such approval must accompany the manuscript. If written approval does not accompany the manuscript it will be assumed that such approval is unnecessary.

7 An article may be submitted by several persons or by a department, and need not be written by the person in whose name it is submitted. The prize will be awarded to the individual or department whose name appears on the manuscript, and may be distributed among the winners on any basis they may desire. Should there be a tie for any prize the full amount will be awarded for each of the articles involved in the tie.

8 Articles may describe any maintenance practice or device used by any department of a railway such as the maintenance of rolling stock, buses, shop equipment or methods and equipment for overhead line repairs, power distribution and power generation devices, signal work, track and way maintenance, etc. Unless manuscript submitted is marked to indicate the department to which it is to be credited, the judges will

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the New Maintenance Contest

READ the conditions of this new and bigger maintenance contest. Any employee or official of an electric railway or bus operating company may compete. No limit on number of items that can be submitted. Don't delay getting started. Winning company, department and individual to be honored at next convention.

READ CAREFULLY

determine the classification under the following divisions: (1) rolling stock and shops; (2) way and structures; (3) electrical and line; (4) buses and garage.

9 Articles submitted for these prizes should be preferably 100 to 200 words in length and should be accompanied by one illustration. Brevity consistent with a proper presentation of necessary information will be given weight in judging articles. In no event should they be longer than 400 words with not more than two illustrations. Articles will be published as promptly as space permits.

10 In rating the various articles the committee will consider the primary value of the method or device as of highest importance. The committee will also consider its practicability, the advantages and economies that are set forth and the clearness and completeness with which the idea is presented.

11 The original manuscript and illustrations will be turned over to the committee of judges for making all awards. These may, however, be published before or after prizes are awarded.

12 All articles must be in the English language and be mailed to the editor of *Electric Railway Journal*, Tenth Avenue and 36th Street, New York City.

Items to be eligible for the first group of departmental prizes must bear a postmark not later than midnight, Jan. 15, 1929; for the second group not later than April 15, 1929; for the third group not later than July 15, 1929. All material bearing a postmark not later than midnight, Aug. 17, 1929, will be eligible for individual cash capital prize, company trophy award and departmental certificates of merit.

13 The announcement of winners of departmental prizes will be made in the issue of *Electric Railway Journal* devoted to maintenance and construction (the third issue each month) in the month following the closing date for each group of departmental prizes. Winners of the company trophy, individual capital cash prize and special departmental certificates of merit will be announced, and awards made, at the 1929 annual convention of the American Electric Railway Engineering Association.

14 Any material submitted may be published at any time after its receipt that the editors of *Electric Railway Journal* decide.

15 All articles submitted will become the property of *Electric Railway Journal* and no manuscripts will be returned.

16 A minimum of $5 will be paid for each item published.

[Additional copies of these rules and full details of the contest may be obtained upon application to ELECTRIC RAILWAY JOURNAL or the American Electric Railway Association.]

in the regular maintenance issues of the JOURNAL following each closing date. The annual cash prize of $200 will be awarded at the convention for the best single item submitted in the contest.

AS STATED in the rules, an annual company maintenance trophy will be awarded at the convention to the company making the greatest contribution to the improvement of maintenance practice through participation in this contest. In determining the winning company, the judges will consider: the total number of items submitted by employees or officials of a given company; extent to which each of the four maintenance divisions are represented in the items submitted; number of individual departmental prizes won; relative merit of all material submitted; extent to which the ideas presented are applicable to other properties; value to the industry of the maintenance ideas made available through participation of employees or officials in this contest. In addition, special certificates of merit will be presented to each department making the best individual showing.

GENERAL INSTRUCTIONS

WRITE on one side of the paper only. Have your article typed if possible, but manuscript written long hand will be accepted. Write the article as though you were writing a letter to another maintenance man giving him your experience with a new method or device. "Fine writing" is not necessary. Give merely the facts and a description of the device or method. Include data on cost savings effected whenever possible.

Envelope and manuscript should be marked "Maintenance Competition." Any number of items may be sent in the same envelope. The Maintenance Data Sheet section of this issue contains items of the type desired.

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Centralized Control of Emergency Service

By Joe R. Ong,
Transportation Engineer Cincinnati Street Railway, Cincinnati, Ohio

In this article, based on a paper presented at the semi-annual meeting of the Electric Railway Association of Equipment Men, Southern Properties, held recently at Cincinnati, the author describes the latest provisions in Cincinnati to insure prompt and adequate emergency service. Motor trucks have been substituted for the former trolley wrecking cars.—Editor.

CONTROL of the Cincinnati Street Railway emergency service is centralized in a dispatcher's office, manned by three dispatchers, each on an eight-hour shift. By this arrangement the equipment is ready for calls during the full 24-hour period of operation.

At strategic points along the various routes the company keeps uniformed supervisors to direct car movements, report trouble and check running times. The latter are entered in a loose leaf form of supervisor's book so arranged that one double page covers an hourly period. Under the old rule, when the supervisors and car crews reported trouble, they called their own division carhouse, and a wrecking car was sent out if necessary. Under the present plan they call the dispatcher who has control of all emergency service.

The company's telephone system centers in a private branch exchange with trunk lines to the Bell telephone system. The dispatcher is located in a separate office in the transportation department and has one telephone line to the private branch exchange and one direct outside line with an individual number. Anyone calling the dispatcher from a city telephone may reach him on this direct wire, or, if the line is busy, he may be reached through the company's switchboard.

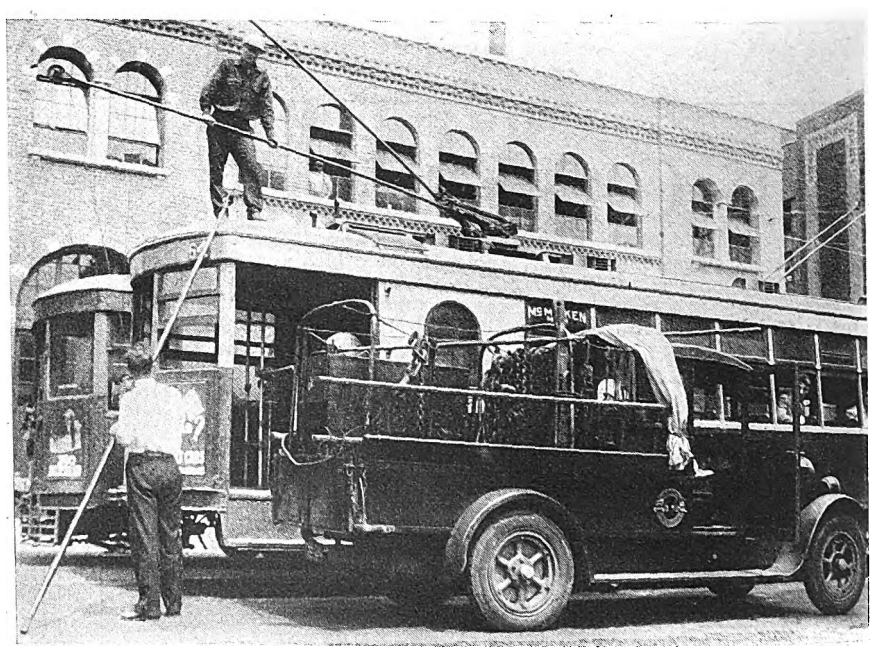
The dispatcher has continuously before him maps, schedules and other data relating to operation. When he receives a trouble call he determines what emergency service is required, from what point it shall be dispatched, and what supervisory officials are to be notified. All of his outgoing calls to carhouses and other points are made through the company's switchboard, and are handled by the regular operator in the same way as any other local call. With but few exceptions, the telephones in the boxes near the supervisors' stations are connected with the private branch exchange and are equipped with relays so that when the operator calls the exchange, the relay closes a five-light circuit on the trolley circuit as a signal to the supervisor that he is wanted.

There are nine operating divisions on the Cincinnati Street Railway system with a carhouse in each division. At five of these, selected for territorial location, motor trucks are stationed for emergency use. Four of these trucks are Fords with ½-ton open bodies, and one is a Dodge-Graham with a 1-ton open body. At a sixth location, just outside the congested area, there is another Dodge-Graham 1-ton truck for emergency service in the downtown section.

These emergency trucks are equipped with necessary tools, such as jacks, chains, blocking, etc. They are found much more effective than the wrecking car of former days as the trucks can more quickly reach the exact scene of the trouble.

The trucks at the carhouses are manned by regular carhouse employees capable of making emergency repairs on the road. This service is available 24 hours per day. At the sixth location near the congested area there is no carhouse. Here, each of the two men assigned to this truck is on a nine-hour shift to cover the eighteen-hour period during which operations are conducted. They have no other duties than to respond to calls.

In addition to these trucks there are two line trouble trucks at the headquarters of the line department near the central section of the city. A third line trouble truck is at one of the carhouses for service to the outlying districts. All line trouble trucks are manned by linemen and only those at headquarters can be used for other work between calls. Whenever a line crew or emergency crew clears trouble after a call, a member of the crew goes to the nearest convenient phone and reports to the dispatcher. Often this saves time in dispatching relief to another point.



The emergency truck drawn up beside a street car permits the change of trolley poles to be effected with a minimum loss of time

Through an arrangement with the fire department, there is a fire alarm indicator in the company's telephone switchboard room. When it indicates an alarm, the telephone operator calls the fire department, finds out the location of the fire and reports it to the dispatcher who, in turn, notifies supervisors and divisions likely to be affected. If the fire call is in the central business area, the dispatcher calls out both the line trouble truck and the emergency truck. The dispatcher's office serves as a clearing house for information for all of the officials of the company who may have occasion to find out what is going on at any particular time.

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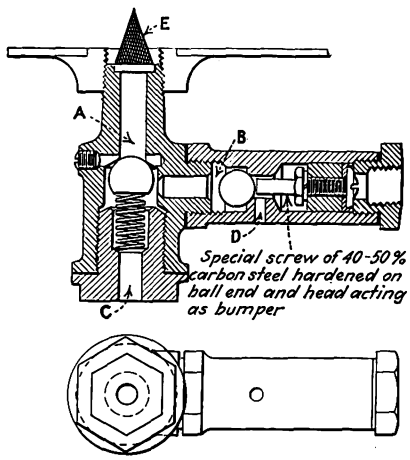
Electric Railway Journal Maintenance Data Sheet
ROLLING STOCK—MISCELLANEOUS—43

Automatic Drain Valve for Air Reservoirs*

By Harvey L. Bullock
General Foreman of Electrical Equipment
New York Central Railroad
White Plains, N. Y.

FOR ridding the air brake system of cars from water, a new valve mechanism has been installed on some of the cars of the New York Central Railroad. This mechanism operates automatically to remove the condensed water from the air reservoir and piping at all times. When the equipment is laid up and the compressor is cut off the valve opens at any predetermined pressure and closes when the compressor cuts in again. The mechanism also ejects the water accumulation in spurts as the compressor is cut in and out in regular service. This is done through the air compressor governor connected to operate the mechanism.



Condensation draining device for air brake system of cars

In the accompanying drawing there are two valves—a low pressure, and a high pressure valve. The low pressure valve is marked *A* and the high pressure valve, *B*. In the low pressure chamber a spring actuated ball valve opens when the pressure drops below 8 to 10 lb. Any water in the reservoir or piping then drains out of the opening *C*. In the high pressure chamber a single ball valve operates on two seats and is actuated back and forth by the intermittent pressure of the air compressor governor. At each movement of the ball any water accumulated in the system is ejected through the opening marked *D*. A strainer marked *E* keeps dirt out of the mechanism that might tend to cause trouble. All parts are of metal and are indestructible.

This mechanism has been tested out in service on multiple-unit cars for several years, and has been subjected to service in freezing temperatures, and found satisfactory. In addition to using the automatic drain valve for draining reservoirs of car equipment, it can be used on supply lines, air-operated switches, etc.

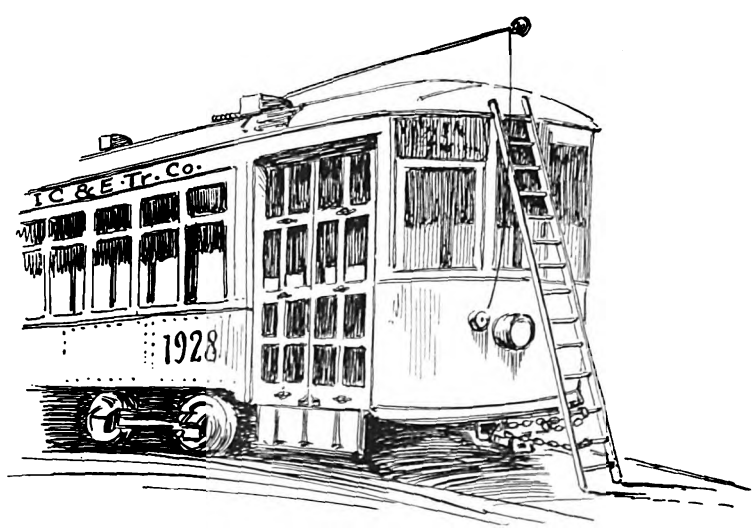
**Submitted in* Electric Railway Journal *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet
ROLLING STOCK—MISCELLANEOUS—45

Safety Chain on Ladder*

By F. J. Foote
Superintendent of Motive Power and Equipment Indiana, Columbus & Eastern Traction Company, Springfield, Ohio

SAFETY chains are installed on ladders in the shops of the Indiana, Columbus & Eastern Traction Company in the manner shown in the accompanying sketch. Before adopting the chain method, spikes were tried on the ladder feet, also cork-lined pads, etc., but the chain was found to be the safest and most satisfactory. A light, strong steel chain about 10 ft. long is attached to the rung of the ladder at one end. The end of the chain is provided with a strong snap. The ladder is placed in the position desired and then the chain is thrown around a truss rod, truck frame or any convenient part. The slack is taken out and the end snapped into the nearest link of the chain.



Safety chain as installed on ladder to prevent slipping

**Submitted in* Electric Railway Journal *Prize Contest.*

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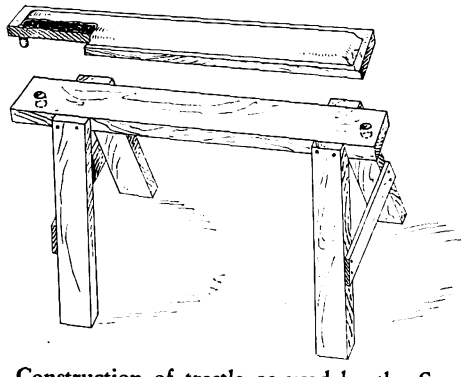
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—44

Removable Trestle Pads*

By Farrell Tipton
Electrician San Diego Electric Railway
San Diego, Cal.

IN EVERY electric railway carpenter shop there is frequent need for padded trestles for supporting finished work such as street car and bus doors and windows. There is also much other work that is most conveniently supported on trestles but which is of such a character that pads are not needed. To provide a removable type of pad for standard trestles so that it is unnecessary to tie up a trestle for finished work only, the San Diego Electric Railway, San Diego, Cal., uses a comparatively simple method.



Construction of trestle as used by the San Diego Electric Railway with removable padded face

Standard sizes of trestles are used throughout the various departments of the shop, and where padding is necessary a board is cut of a length and width identical with the trestle face. One side of this board is padded and the opposite side is provided with two $\frac{3}{4}$-in. dowel pins. These are located 2 in. from either end, as shown in the accompanying illustration. The faces of the trestles are then drilled to receive the dowel pins. The padded board can be placed in position or be removed quickly by this arrangement.

Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—46

Brake Adjustment Troubles Eliminated

BRILL 27-G trucks in use on the New York & Queens County Railway, Long Island City, N. Y., originally had turnbuckle brakeshoe adjusting rods. These caused considerable trouble in service as the threads became worn, permitting excessive motion between rod and turnbuckle. This wear finally sheared the turnbuckle cotterpins and caused a loss of the braking power. Troubles of this nature have been eliminated by a new design of adjusting mechanism adopted recently. It is shown in Fig. 1. This mechanism consists of two $2\frac{1}{2}$x$\frac{3}{4}$-in. flat bars riveted together and held $1\frac{1}{16}$ in. apart by pipe spacers. A number of $1\frac{1}{16}$-in. holes provide for shoe adjustment. The dead lever rack was also redesigned with a larger number of $\frac{13}{16}$-in adjusting holes to permit of obtaining a still finer shoe adjustment. This design is shown in Fig. 2.

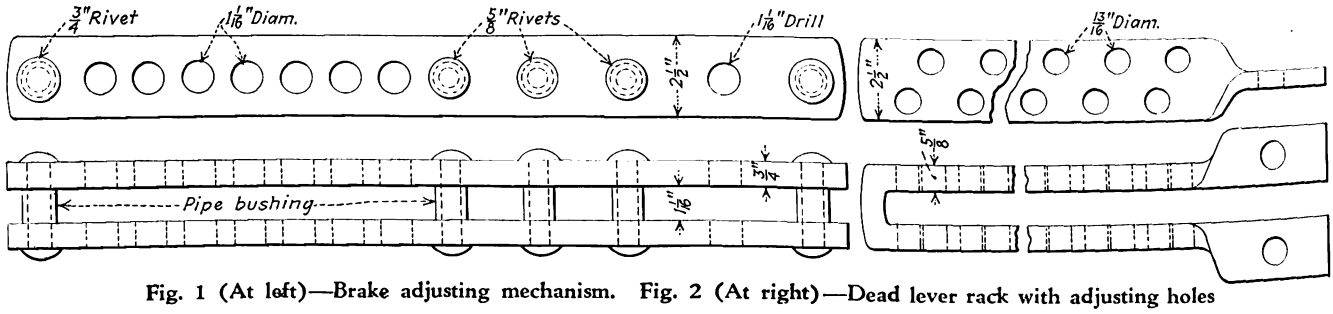


Fig. 1 (At left)—Brake adjusting mechanism. Fig. 2 (At right)—Dead lever rack with adjusting holes

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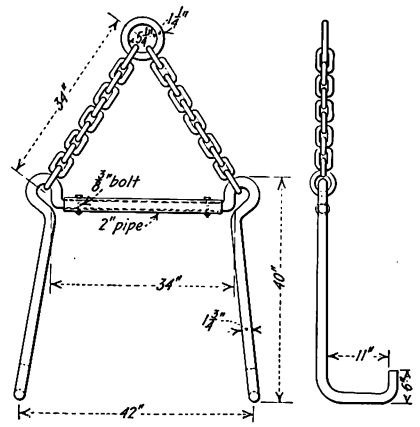
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—47

Lifting Hook for Three Operations

WHEN a shop tool can be designed to serve many purposes the number and cost of the tools required and the cost of their maintenance can be reduced. This fact is considered of prime importance in the shop of the Staten Island Rapid Transit Railway, Staten Island, N. Y. It has been determined that the cost of the time involved in constantly changing the lifting tools to perform certain operations amounts to an appreciable sum at the end of a year. For this reason the hooks shown in the accompanying sketch were developed to accomplish three important operations. Motors are lifted from the truck, wheels are handled and trucks are raised.

The hooks are made from 1¾-in. round steel and are 42 in. between centers at the bottom and 34 in. at the top. The top corners are formed with the eye for supporting a ¾-in. lifting chain made of 1¼x2¼-in. links. These chains are fastened to a ring made of 1¼-in. material which has an inside diameter of 5¼ in. To provide additional strength the top horizontal rod is placed inside a 2-in. pipe, the ends of which are in contact with the eye metal. It is held in place by two ½-in. through bolts. The over-all height of this pair of hooks is 40 in. Each hook is 6 in. high and has an opening of 11 in. They have accomplished the purpose for which they were designed and not a single failure or accident of any kind has occurred in the company's shop since they have been placed in service.



This lifting hook can be used for several operations

Electric Railway Journal Maintenance Data Sheet

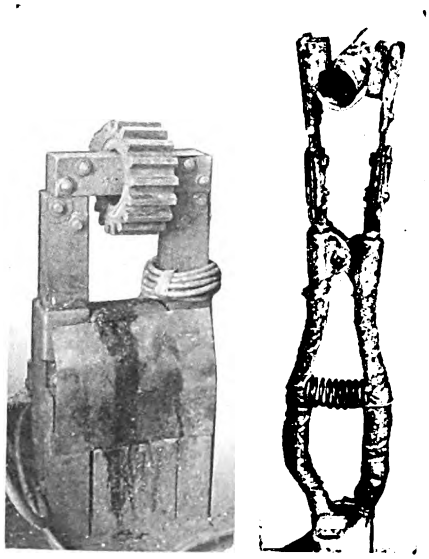
ROLLING STOCK—ELECTRICAL—59

Pinions and Lugs Heated Electrically

FORMER methods of heating pinions for making a shrink fit on armature shafts have been displaced in the Chicago, Milwaukee, St. Paul & Pacific Railroad shops at Deer Lodge, Mont., by the induction heater illustrated. The heater consists of a closed core transformer with 160 turns of magnet wire on the primary consuming approximately 1,500 watts at 110 volts. The core is of laminated iron 4 in. square and has a removable section on which the gear is placed. When the primary of the transformer is energized with a gear in place as shown, the gear constitutes a short-circuited secondary winding of one turn, in which a heavy current circulates and produces rapid heating.

For a 45-lb. pinion about 25 minutes is required to bring the temperature to 312 deg., the proper temperature for the shrink fit. This method of heating is uniform and eliminates scale and other objectionable features of a forge or other methods of heating.

Another use for the transformer is for heating lugs with the carbon tipped holder, shown in one of the accompanying pictures. The current which is passed through the lug is obtained from the small coil shown on the right-hand leg of the transformer core. This coil contains twelve turns of No. 5 wire and produces 100 to 130 amp. at about eight volts. The lug heater has been found very handy in reaching into a motor to solder or unsolder a lug.



At left—A gear placed on the transformer becomes a short-circuited secondary and heats quickly

At right—Leads from a stepdown secondary coil facilitate the heating and soldering of lugs

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Electric Railway Journal Maintenance Data Sheet

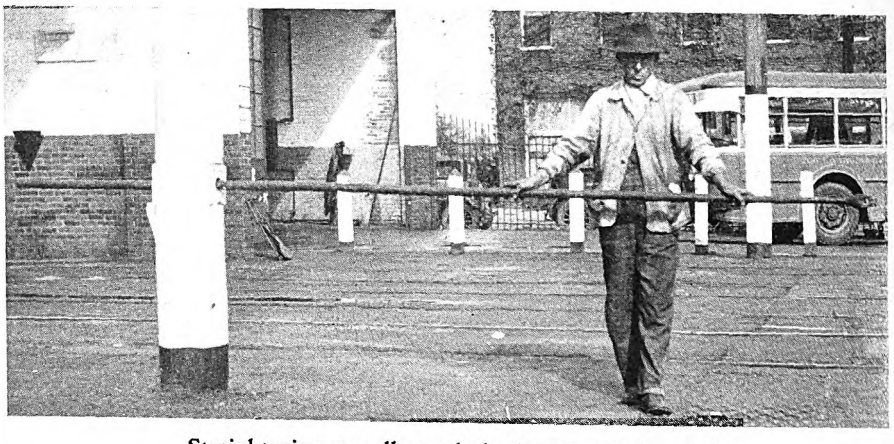
ROLLING STOCK—MISCELLANEOUS—48

Simple Method of Straightening Trolley Poles*

By C. B. Hall

Chief Clerk Mechanical Department Virginia Electric & Power Company, Norfolk, Va.

STRAIGHTENING trolley poles is a comparatively simple task for the mechanical department of the Virginia Electric & Power Company at Norfolk, Va. One of the poles supporting overhead wires in the carhouse yards was drilled at a point approximately 3 ft. from the ground, the hole being large enough to accommodate any size of trolley pole. To withstand the pressures when poles are being straightened the hole was reinforced by bolting a ½x6x8-in. iron plate at each end. Greatest pressure for straightening necessarily comes at the ends of the hole and the iron plates take care of this.



Straightening a trolley pole by inserting it in a hole and bearing downward

The accompanying illustration shows a workman using the hole for straightening a pole. A 12-ft. 4-in. trolley pole has been inserted through the opening and the mechanic is exerting only a slight down pressure to restore it to its proper shape. The device is a big saver of time and labor.

**Submitted in* Electric Railway Journal *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

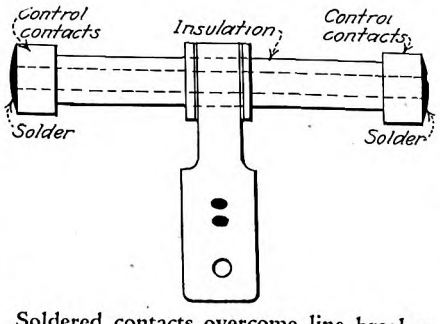
ROLLING STOCK—ELECTRICAL—60

Soldered Breaker Contacts Reduce Trouble*

By H. J. Beadle

Engineer of Equipment Dallas Railway and Terminal Company, Dallas, Tex.

RECENTLY trouble was experienced on one of the cars of the Dallas Railway & Terminal Company, Dallas, Tex., when the line breaker refused to function. Careful investigation showed that the small round control contacts on the control handle, as shown in the accompanying diagram, were loose on the stem. The loosening was caused by the sliding and rolling action while closing. After the round contacts began rolling about the stem which holds them, the latter was worn very badly in a short time, and then poor contact developed. To overcome the difficulty the contacts were soldered to the stem. Since that time it has become standard practice to solder all contacts to the main stem, and the trouble has not occurred since.



Soldered contacts overcome line breaker trouble

**Submitted in* Electric Railway Journal *Prize Contest.*

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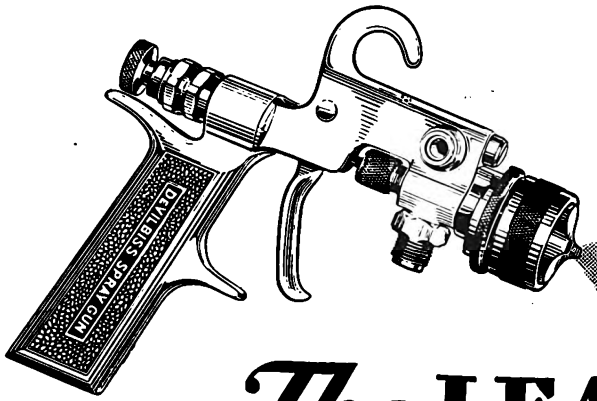

The LEADERSHIP *that* CONTINUES *to show the way*

THERE are definite and valuable advantages to the electric railway operator in the fact that DeVilbiss leadership served at the introduction of spray painting and spray finishing into every industry and group now using this new and better method of applying protective and decorative coatings, and that DeVilbiss today offers the most recent new economies and efficiencies in all such operations.

Finish on transportation units, buildings and equipment is now a vital part of the sales operation, as well as a necessary maintenance measure. Good-looking equipment gets the business. And DeVilbiss meets this twofold need with specialized spray-finishing outfits that you can use with the assurance of satisfactory results and economies never before obtainable.

The present comprehensive magnitude of the DeVilbiss organization, its vast manufacturing capacity, its unequalled engineering experience and its firmly established responsibility to the purchaser of its products are all the results of a continuous progression of DeVilbiss leadership in service to all users of spray-painting and spray-finishing equipment.

The individual painting or finishing problems of each class of users are specifically studied and served by specialized DeVilbiss installations, methods and devices. The best practice known today in the field in which you operate, and the most efficient and modern equipment for your particular use, are DeVilbiss methods and equipment. This experience and knowledge will save you money and time and earn the good-will of your customer. Use it freely. We will esteem it a privilege to put it at your disposal.

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Strength and durability—trolley, span, lighting wires, lighting units, traffic signals, all supported by one pole. Elreco Tubular Steel Poles hold them even under loads of sleet and ice and the shock of hurricanes. Many Elreco Poles have been in service more than 35 years.

Accessibility—Elreco Poles are easy to inspect and maintain.

Beauty—trim, they enhance the looks of any thoroughfare.

Economy—several companies using one pole reduces, to each, the cost of installation and maintenance.

Write for details of why hundreds of railways and cities have adopted Elreco Tubular Steel Poles

The Electric Railway Equipment Company

2900 Cormany Ave., Cincinnati, Ohio

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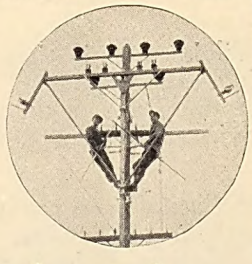
A new technique in live line maintenance and repairs



MASTER Live Line maintenance equipment makes possible a new and safer method of handling live line work. On pin type construction, the advantages of this new method permit maintenance and repairs to be conducted on live lines under normal conditions and deliver several unusual advantages in the handling of this class of work.

Lowered costs, far fewer outages, speed and convenience of handling routine maintenance work, plus considerably greater safety are the direct advantages from the use of Master live line equipment. These advantages are so outstanding and the methods of operation with Master live line equipment so simple and convenient that operating officials who have used this equipment now regard live line work as a matter of routine and would not be induced to go back to the former methods of operation.

Master equipment is fully described and the methods of handling live line work fully illustrated in Bulletin No. 3, copies of which will be sent to interested operating officials upon request.

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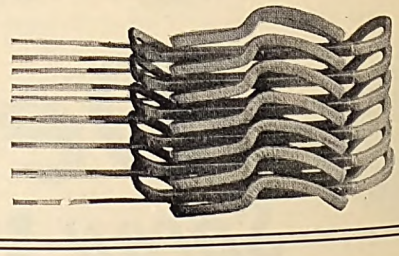
They are ideal for maintenance work. Try them on your next job. Write—



THE ELLIOTT-THOMPSON ELECTRIC COMPANY
AJAX BLDG., CLEVELAND, OHIO

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Electric Railway Journal Maintenance Data Sheet

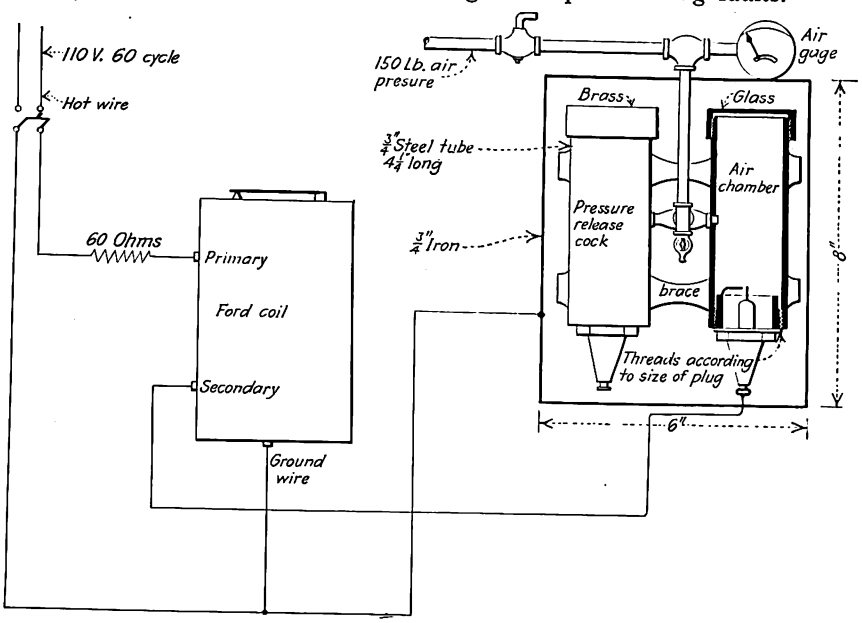
BUSES AND TRUCKS—18

Testing Spark Plugs Under Pressure

By J. A. Doddridge
Garage Foreman San Diego Electric Railway, San Diego, Cal.

MANY spark plugs that will give a suitable spark under ordinary atmospheric conditions will not spark at all when submitted to a pressure corresponding to what they obtain in actual operation. To test spark plugs under pressure and to determine the pressure at which the spark begins to weaken, the San Diego Electric Railway has a special testing equipment in its garage. This consists of two cylinders, each having a glass top and provided with threads at the bottom into which can be screwed various types of spark plugs. These cylinders are connected to the shop air line which has a pressure of 150 lb. The electrical circuit of the spark plug is through an ordinary Ford coil. This has a switch so that when it is closed the coil will vibrate and the spark plug will function.

A shut-off valve is provided in the air line so that air can be admitted and the pressure built up in steps in the air chambers. It is found that some plugs will not operate at 50 lb. and others will fire at 150 lb. pressure. An air gage in the line shows the pressure at which the plugs break down. This tester has proved a great help in locating faults.



Type of spark plug tester used by the San Diego Electric Railway

Electric Railway Journal Maintenance Data Sheet

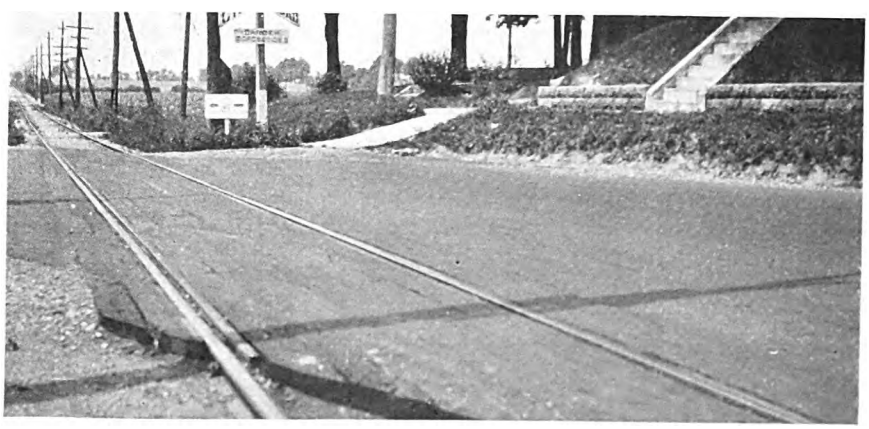
TRACK AND WAY DEPARTMENT—37

Prolonging the Life of Plank Crossings*

By D. H. Walker
Chief Engineer, Terre Haute, Indianapolis & Eastern Traction Company Indianapolis, Ind.

IN AN effort to prolong the life of plank crossings now in place, and yet keep the surface smooth for vehicular traffic, the track forces of the Terre Haute, Indianapolis & Eastern Traction Company have found that good results can be obtained cheaply by the use of cut back asphalt.

The plank is given a thin coating of this asphalt and then sprinkled lightly with grit or sand. The resulting carpet forms a smoother surface and helps prevent rotting of the plank. The cost is but a few cents per yard. The accompanying illustration shows a crossing which was treated more than a year ago. Nothing has been done since. Although this crossing is used by about 2,000 vehicles daily, it is still very smooth and shows no appreciable signs of wear.



This plank crossing has been preserved by a thin coating of asphalt

*Submitted in Electric Railway Journal Prize Contest.

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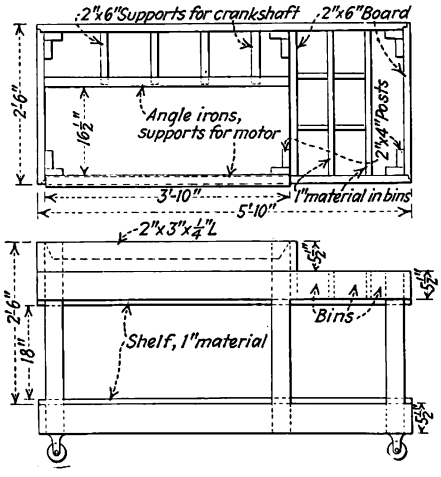
Electric Railway Journal Maintenance Data Sheet

BUSES AND TRUCKS—19

Overhaul Rack for Bus Engines*

By C. B. Lain
Engineer Mechanical Department
San Antonio Public Service Company
San Antonio, Tex.

RACKS for storing parts of bus engines which are to be overhauled are used in the shops of the San Antonio Public Service Company. Each of the three in use consists of an upper and lower deck supported by six vertical members, and equipped with casters to make it portable. The upper deck is divided into compartments, one being arranged with cross supports to receive the crankshaft, one with parallel angle bars to support the engine block in a vertical position and seven compartments or bins to receive smaller engine parts such as carburetors, bolts, nuts, valves, etc. The lower deck has no divisions, and on it are stored the larger parts such as manifolds, crankcase pans, engine heads, generators, starters, etc.



Overhaul rack for buses used by the San Antonio Public Service Company

These racks cost approximately $30 each to construct. By keeping the parts together in an orderly manner a saving of three to six man-hours, or an average of $3.09 per engine, is made. Since no parts are lost and it is unnecessary to search through a mass of parts to find a particular one this saving will more than pay for the rack in one cycle of overhaul.

In addition to the advantages mentioned the use of the rack keeps all parts together so that the shop presents a more orderly appearance. The racks may be pushed to the most convenient place in the shop for doing the work, thus relieving crowding.

**Submitted in* Electric Railway Journal *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

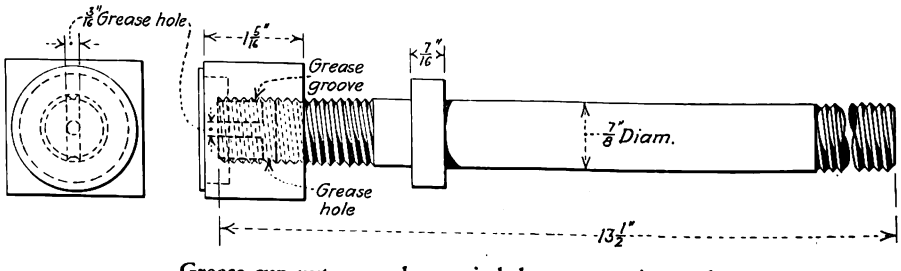
TRACK AND WAY DEPARTMENT—38

Grease Cup Nut Prevents Rust*

By H. Erdis
Switchman
Toronto Transportation Commission
Toronto, Canada

IN MANY cases of broken switch tongues or switch tongue connector rods on the lines of the Toronto Transportation Commission, considerable time has been required to disconnect the rod from the switch tongue lug, due to formation of rust. To overcome this trouble a nut is now used with a grease chamber.

The accompanying sketch shows the construction of the nut. It is made large enough so that one side will be held from turning by the bottom of the tongue. The top is drilled out and a cap is welded on. This forms a recess which is filled with grease before the installation and when the connecting rod is screwed into the locked nut a certain amount of grease is forced around the thread through $\frac{3}{16}$-in. holes provided in the rod. With this arrangement the rod and nut remain coated with a film of grease or oil which effectively prevents the formation of rust. This in turn insures quick replacement.



Grease cup nut as used on switch box connecting rods

**Submitted in* Electric Railway Journal *Prize Contest.*

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Association Activities

Popularize Transportation Through Better Maintenance

Reducing railway and bus equipment maintenance costs without impairing service, securing good will and solving motor bus problems are principal subjects at Iowa convention

DISCUSSION of both railway and bus maintenance problems was entered into heartily by the hundred or more delegates who attended the eleventh annual convention of the Iowa Electric Railway Association, Operators' Section, held at Cedar Rapids on Nov. 8 and 9. Although maintenance was the principal subject, other interesting papers were presented, including papers on urban transportation by public carriers, the motor bus in commercial transportation, efforts and results of manufacturers in popularizing electric railway and bus transportation, and the Iowa motor carrier law and its administration.

In his paper on the cleaning, painting and lubrication of cars and coaches, F. V. Skelley, superintendent of equipment Des Moines City Railway, called attention to the fact that while everyone admires a clean, well-ventilated street car, to gain this result requires a trained organization that knows how and when to sweep and clean. Let us take, for example, he said, a carbarn that houses 91 cars, 40 of which are regulars and the remainder trippers or extras. Here six men are classified as sweepers on an eight-hour basis and put in 75 per cent of their time at this work. As one man can sweep eighteen to twenty cars in eight hours, the average cost for this work would be about 20 cents per car. As cars are inspected on the 1,200-mile basis, said Mr. Skelley, we are sure of a well-cleaned car every six days. This weekly cleaning requires 45 minutes and costs 75 cents per car.

Buses and coaches are not washed on a mileage basis. They are swept, dusted and mopped on the inside every time they come in, and are washed on the outside only when they need it. This is not unusual, as some buses are on lines where it is very easy to keep them clean, while others such as specials require a thorough cleaning every time they come in.

The shop schedule calls for the complete overhauling and painting of two cars a week, added Mr. Skelley. City cars are painted every 24 months, and interurban cars and coaches when money is available. He gave the approximate cost for painting as follows: city cars, $125; interurban cars, $200; locomotives, $100; city buses, $76, and interurban coaches, $140. This work is handled in a paint room with a capacity for two cars and a working force of seven men, including a foreman.

Transferring his attention to the subject of lubrication, Mr. Skelley said that the armature bearings are the most vital parts of the truck to be lubricated, and with waste and oil well types of housings require tests every 1,200 miles. "We use no less than five grades of oils and greases on our buses," continued Mr. Skelley, "and the time and thought given to this subject have been worth while. During the past six months several oils have been tested and the results have varied from $1.04 to $2.83 per 1,000 bus-miles."

The main factors in the proper lubrication of a bus engine were summarized by Mr. Skelley as follows: (1) replenish oil frequently and fill crankcase to the level recommended by the manufacturers; (2) use only oil of the highest quality and proper viscosity; (3) keep the engine in as perfect operating condition as possible, and (4) test the oil drained from the crankcase for reclaiming.

Maintaining the Electrical Equipment

Shop practices in connection with the maintenance and operation of electrical equipment was the subject of an exhaustive paper by Ben Dawson, electrician Cedar Rapids & Marion City Railway. The proper maintenance of every piece of electrical equipment for street cars was discussed in detail, particular attention being paid to the controllers and motors.

In speaking of controllers, Mr. Dawson gave the following advice: The care of controllers should be given to one person. If there are too many controllers to look after, prorate the work to more men. Internal cleanliness is essential. Keep out all dust, excess grease and oil. See that all fingers are set firmly and properly. Remove all worn-out fingers. File all burned segments and finger tips. Replace the bad ones. Most segments can be reversed; this prolongs the wearing life of the segments. Look carefully for free contacts on reverse drums. These fingers are easily caught and may be shoved back in case of reversal. Replace all pierced arc deflector plates at once. The main cylinder should be thoroughly cleaned at every car inspection. It is good practice to shellac the control drum twice a year. Examine carefully all wiring contacts at inspection time. Remedying a poor contact upon discovery may save a good deal of time and money for the company later on. Examine carefully the cut-out switches. See that they work freely and fit the switch jaws snugly in both the in and out positions. Use a good grade of petrolatum for the finger tips and segments. A good rule is to use a little at a time, but to use it often. Oil drum bearings once a month for good results. Eternal vigilance is the price of safety in the care of controllers, for no auxiliary on a street car is used more or abused more.

Electric railway motors should be capable of operating at scheduled speed under all loads, in all kinds of weather and for long hours of service, emphasized Mr. Dawson. They should be built for the most severe service conditions with long life and low upkeep characteristics. The most essential requisite in caring for railway motors is to lubricate them properly. No matter whether split, solid or roller bearings are used, proper and constant care is needed in the matter of lubrication.

James Thompson, superintendent of overhead construction Tri-City Railway, Davenport, outlined the procedure followed on his property in maintaining 94 miles of overhead with a crew of only two linemen, a groundman, a driver and a foreman. He called particular attention to the service record of a type of hanger designed by his own line department in 1906 and still in excellent condition.

Variable Load Brake Equipment

"Introduction by electric railways of light-weight, relatively large capacity cars has brought braking problems not heretofore encountered" said J. S. Y. Fralich, district manager Westinghouse Air Brake Company, Chicago, Ill. This he attributed to the fact that single-truck cars frequently carry loads equal to the weight of the cars themselves and that many double-truck cars weighing approximately 30,000 lb. empty, weigh from 45,000 to 50,000 lb. when loaded with passengers. A wide variation between empty and loaded weights makes it impossible to provide suitable braking facilities under variable conditions of loading with the ordinary type of straight air brake equipment.

The speaker cited average brake design standards on electric railway straight air brake installations to show that under reservoir pressures varying from 50 to 65 lb. per square inch, braking ratios on empty, modern light-weight cars vary from 85 to 100 per cent with minimum reservoir pressure.

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and from 110 to 130 per cent with maximum reservoir pressure. Even with these braking ratios which the speaker considered higher than necessary for empty car conditions, in some cases traffic distances are excessive when such a car is fully loaded.

It was because of this unsatisfactory braking that the Westinghouse Company developed its variable load brake, according to Mr. Fralich. This device, he explained, constitutes an automatically adjusted seat valve that is set for the brake pressure desired to meet the change in weight brought about by the variation from empty to full car loads. The speaker called attention to the importance of the equipment from the standpoint of safe operation and increased schedule speed.

Popularizing Transportation

Summarizing the efforts of manufacturers to popularize electric railway and bus transportation, W. A. Clough, engineer General Electric Company, emphasized that transportation to be acceptable to people must be swift, safe and sure, and must embody comfort, convenience and class. Engineers have made it possible, continued Mr. Clough, to make schedules that were considered impossible a few years ago. They have learned to make materials do more work, have reduced weight with added strength, have made it possible to accelerate and retard street cars at rates hitherto considered impractical and have learned how to make the losses of the equipment do useful work in heating the cars.

To make transportation acceptable is still the problem of the engineer, but the artist and the salesman have to work alongside. The whims of human beings have to be considered, and as far back as classic times these whims have been recognized as fickle. Comfort, convenience and class have been introduced to the people by the bus and the public has declared in no uncertain terms that it will continue to demand these things. This change in the demands with regard to transportation has entirely upset the old ideas and methods used by transportation companies for many years.

It is safe to say, continued Mr. Clough, that no one really knows what kind of equipment, what kind of cars, what kind of buses they want to use. The entire industry is torn between an automotive street car and a street car bus, between rail and rubber. With all this confusion, with all the changing ideas of the operator and the public with regard to what they need, it seems of the greatest importance to the entire industry that transportation be made intelligible to the people. And people must be brought to realize that present-day conditions call for community rights rather than individual rights; that the thoroughfares and rights-of-way which are paid for by the people collectively, should be reserved and preserved for the use of the people collectively; that private conveyances should not have the right to monopolize the street, and that vehicles for public transportation should at all times have the right of way.

Specifically then, the task is to establish in the minds of the American people correct fundamental facts concerning transportation. Teach them what it means in time and energy to accelerate rapidly and brake rapidly, and to have the right-of-way unimpeded so that intermediate stops and slowdowns are not necessary, urged Mr. Clough, and it will not be difficult to secure ordinances and regulations that will favor community transportation.

Concluding, Mr. Clough asked the railway operators what they in turn had done to popularize their electric railway and bus transportation services. "Have you visualized your product as transportation or only as a street car ride? Have you used the tools available to you to the best advantage? Have you undertaken any research to find the underlying reasons for the change in the demands of the people? Have you educated your people to think correctly about this business of yours?" These things you must do, he declared, adding that railway men and manufacturers need a better understanding of their mutual problems to the end that the public may be better served and the transportation industry be made more prosperous.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Nov. 21-22*—Public Utilities Association of Virginia, Hotel Roanoke, Roanoke, Va.**

***Nov. 21-22*—Central Electric Traffic Association meeting, Auditorium Hotel, Cleveland, Ohio.**

***Dec. 7*— Metropolitan Section, American Electric Railway Association, 33 W. 39th St., New York, N.Y.**

***Dec. 10*—National Highway Traffic Association, annual meeting, Automobile Club of America, New York, N. Y.**

***Jan. 14-18, 1929*—American Road Builders' Association, convention and road show, Cleveland, Ohio.**

***Jan. 22*—New York Electric Railway Association, mid-winter meeting and dinner, Hotel Commodore, New York, N. Y.**

***Jan. 23-25, 1929*—Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.**

***Jan. 24-25*—Central Electric Railway Association, Claypool Hotel, Indianapolis, Ind.**

***Jan. 25-26*—Central Electric Railway Accountants' Association, Claypool Hotel, Indianapolis, Ind.**

***Jan. 28-Feb. 1*—American Institute of Electrical Engineers, annual convention, 33 W. 39th St., New York, N. Y.**

***Feb. 14*—Central Electric Railway Master Mechanics' Association, Youngstown, Ohio.**

Problems of the Motor Bus

L. A. Rossman of the Northland Transportation Company, St. Paul, Minn., in his paper on "The Motor Bus and Commercial Transportation," told of the development of his company and its relation with the parent company, the Great Northern Railway. As one of the leading problems of the motor bus industry Mr. Rossman mentioned that of income. Too many motor bus lines pay well in summer and operate at a loss in other months, he stated. The returns of the good season are eaten up by the months of losing operations. To overcome this situation, a motor bus enterprise must have diversification. Some of the service must be rendered to sections in which there is winter traffic.

Economy in motor bus operations is essential but a low operating cost is not necessarily a measure of success, according to Mr. Rossman. Some motor bus operators should spend more than they do. It is a question as to whether or not an expenditure of an additional cent for developing business, another penny for better equipment and another penny for a better man behind the wheel, might not bring larger patronage and larger net earnings. The great progress in the motor bus industry in the coming few years will not be so much in the lowered costs as in fair costs, larger incomes and greater net returns. The speaker also discussed at some length the problems of safety, taxation and regulation.

Securing Good Will of the Public

In his paper on urban transportation by public carriers, F. S. Welty, assistant general manager Omaha & Council Bluffs Street Railway, called attention to the need for developing good employee and public relations. Good will, said Mr. Welty, is not acquired merely for the asking. It requires courtesy, good service, good equipment, judicious advertising and a genuine desire to serve the public faithfully and well. Courtesy, he continued, goes into the matter of salesmanship and is the meat of selling better transportation better. It should be differentiated from politeness in that the latter quality is an acquired polish while courtesy comes from the heart. Good service cannot be given, added Mr. Welty, with unattractive, obsolete cars, operated over broken-down tracks by dissatisfied and discourteous employees. People today expect more and are in a position to demand it because there are other means of transportation available. Mr. Welty described in some detail the program of good-will development which has been followed in Omaha and cited the variety of employee contacts with the public which has been encouraged with the advent of the new management.

In the common carrier and utility field a regulated monopoly is better for the public than are numerous competitors serving the public, declared C. M.

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Richardson, commissioner Iowa Railroad Commission, in discussing the Iowa motor carrier law and its administration. It is my belief, he continued, that the commission should at the disposition of motor carrier applications determine whether the existing transportation is adequate to the needs of the public, whether there is public demand for additional service, whether the applicant is able to engage in the undertaking which he proposes and whether the highways will permit of continued and reliable operation. The commission also should analyze the probable effect the establishment of other service would have from that which already exists. Mr. Richardson spoke at some length of the present Iowa motor carrier law and pointed out that it was enacted to bring about a comprehensive and coordinated scheme of transportation.

The meetings on two days of the convention were presided over by E. J. Anderson, general superintendent Tri-City Railway, Davenport. The delegates were welcomed to Cedar Rapids by Mayor J. F. Rall, who noted with pride that the delegates were assembling in the first Iowa city to voluntarily effect an upward adjustment of street car fares. Maurice Welsh, chairman of the executive committee, replied to the Mayor on behalf of the association. The annual banquet was the entertainment feature of Thursday evening, while on Friday afternoon the delegates were taken on a sightseeing tour of Cedar Rapids. Next year's convention will be held in Waterloo with Frank McDonald of the Waterloo, Cedar Falls & Northern Railway as chairman.

Group Luncheon Meetings at Virginia Convention

FOR the first time the Public Utilities Association of Virginia will hold group luncheon meetings at its annual convention, which opens for a two-day session at the Hotel Roanoke, Roanoke, Va., on Nov. 21. These groups will meet at 1 p.m. on the first day, and will be divided as follows: Electric Light, Power and Telephone; Transportation; and Gas and Water. A leader will be in charge of each group to conduct the discussion of the subjects.

According to a statement made by A. B. Tunis, secretary of the association, about 350 delegates, men and women, are expected to attend the convention.

Several prominent public utility representatives from over the state and from Eastern cities have been secured to address the delegates. The addresses will include "The Relation Between Public Utilities and the Public," by William Meade Fletcher of the State Corporation Commission; "Some Problems of Urban Transportation," by Tom P. Walker, vice-president Virginia Electric & Power Company; "The State Conservation and Development Commission," by William E. Carson, chairman of the commission; "Investment Banking Views on the Public Utilities Business," by Harry R. Hayes, vice-president of Stone & Webster and Blodget, Inc., New York City, and "Fundamental Rate Base," by N. M. Argabrite, vice-president of the American Gas & Electric Company, New York City.

Recognizing the large activities of women folks in the industry, the association plans to organize a women's committee or auxiliary at the convention, according to an announcement made by the president, J. W. Hancock. With this in mind, Mr. Hancock said, a part of the program has been set aside for the formation of the auxiliary. Prominent women will address the group.

Anticipating the presence of about 100 women at the convention, several special features have been arranged by the committee in charge of the convention for their benefit and entertainment. Apart from sightseeing trips about Roanoke, the visiting women are scheduled to hold a luncheon at the Hotel Roanoke on Nov. 22, after which they will go to the Roanoke Country Club for a bridge tournament and a buffet supper dance.

American Association News

Special Reports Being Prepared

Following is a list of special reports that are being prepared by the bureau of information and service of the American Electric Railway Association and that will be available to member companies upon request:

Bulletin No. 221—CHARTS ILLUSTRATING RECENT TRENDS IN ELECTRIC RAILWAY OPERATIONS AND ELECTRIC RAILWAY BUS OPERATIONS.—A reproduction of a series of charts prepared for exhibition at the 1928 convention, showing trends of traffic, revenues and expenses, fares and wages, automobile registrations and their effect on passenger traffic, growth of electric railway bus operations, methods of handling depreciation of buses, distribution of bus operating expenses and electric railway operating expenses, comparison of operating costs in 1927 and 1926, and other charts designed to show the outstanding trends in the transportation industry. The charts are accompanied by a running story explaining how they were compared and their significance.

Bulletin No. 222—ANALYSIS OF BUS OPERATIONS IN CALIFORNIA—This bulletin gives a comparison of the reports of independent bus companies of the California Railroad Commission for the years 1922 to 1926 inclusive. For each of the five years covered there is given for each company a complete income statement, balance sheet and statistics on the number of buses operated, car-miles run, passengers carried, etc. By means of this bulletin, therefore, one is able to trace over a period covering more than the ordinary life of a bus the record of investment and operating costs and their effects on bus operating profits.

Bulletin No. 223—TRAFFIC PROMOTION ON ELECTRIC RAILWAYS—This is a compendium of material collected from various sources, describing methods adopted and experiments tried out by electric railways in their efforts to build up increased traffic on their lines. In each case the experiment is described in some detail, together with the condition under which it was tried and a brief summary of results obtained. It is a revision of the material contained in Bulletin No. 37, issued Aug. 1, 1925, and includes all of the outstanding methods and innovations attempted since that time.

Bulletin No. 224—ELECTRIC RAILWAYS OPERATING MOTOR BUS LINES.—A new, revised list of electric railways now operating motor buses covering approximately 365 companies and showing for each company the date bus service started, the number of buses operated, miles of route, type of service, type and seating capacity of buses used, fares, and transfer privileges in effect.

Bulletin No. 225—COST OF LIVING STUDIES.

Bulletin No. 226—EFFECT OF FARE CHANGES ON REVENUES AND RIDING HABIT.—This is a revision of Bulletin No. 116, issued Dec. 1, 1926, bringing up to date the information contained in that bulletin and in addition including data on several more companies. The compilation contains a detailed record of the revenue passengers and passenger revenue month by month before and after the date of a fare change, and covers companies having had two or more fare changes. The average daily number of passengers carried and the average daily passenger revenue under each rate of fare is compared, and there is also shown a comparison of the percentage of revenue passengers using transfers and reduced rate tickets under each rate of fare.

Bulletin No. 227—TREND OF ELECTRIC RAILWAY OPERATIONS—A comparative record of the revenues, expenses, taxes, car-miles, revenue passengers, and operating ratio of a group of 127 companies for the first six months of 1925 compared with the first six months of 1924 and monthly thereafter, up through June, 1928. The group is also subdivided into separate similar statements for each of the geographical divisions of the country.

Bulletin No. 228—DEPRECIATION DECISIONS.—This compilation brings down to date the information given in Bulletin No. 158, issued Sept. 1, 1927, containing extracts from decisions of public utility commissions fixing the rate of depreciation to be allowed on electric railway properties. It is preceded by a tabulation arranged by states of the rates allowed by commissions, showing the name of the commission and the depreciation rate fixed, the basis of the rate, whether on valuation or earnings, and the reference to the decision. It is followed by abstracts from the decisions, giving the commission's discussions and comments on the subject.

Bulletin No. 229—COST OF LIVING STUDIES.

In addition to the above bulletins the following supplements have been prepared, bringing the information they cover down to date:

Supplements Nos. 12 and 13 to Bulletins Nos. 163 and 164—ELECTRIC RAILWAY FARES.

Supplements Nos. 1 and 2 to Bulletin No. 218—WAGES OF TRAINMEN.

Supplements Nos. 1 and 2 to Bulletin No. 219—WAGES OF BUS MEN.

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News of the Industry

Fare Increase in Minneapolis Formally Sought

Application was made by the Minneapolis Street Railway, Minneapolis, Minn., before the Minnesota Railroad & Warehouse Commission on Nov. 15 for an increase in the rate of fare, which is now 8 cents cash and six tokens for 40 cents. The company regards this the only recourse in the light of the decrease in patronage and the necessity of maintaining service at the present high standard. In other words, it is not possible to cut operating expenses in the ratio of the decrease in revenue and at the same time give good service.

The St. Paul City Railway, which has the same rate of fare as Minneapolis, applied on Sept. 8, 1927, for an increase, but this application was never acted upon. That application was made only after voters at St. Paul had twice at special elections refused to indorse an amendment to enable the City Council to give the railway relief in the case of some onerous taxes and charges which originated in horse-car days. The first defeat was in an election on Nov. 2, 1926, and the second Sept. 6, 1927, and the application for increase was made two days later.

Horace Lowry, president of the Twin City Rapid Transit Company, the holding corporation for the two cities' lines, accompanied the application with a statement which follows in part:

The local situation reflects the national condition. We are carrying 25,000,000 a year fewer passengers this year than we carried in 1925. The increase granted us on Jan. 1, 1926, did not anticipate this unprecedented falling off in passengers. Consequently, at no time since this date has the company earned a fair return on the value of the property.

Let it be understood that a fair return does not mean a return on the outstanding stocks and bonds of the company. A reasonable return on the fair value of the property never has been nor cannot be a guarantee of any earnings on stocks and bonds. It is a return on the established value of the property.

The existing rate of fare—8 cents cash or six tokens for 40 cents—is lower by 1 cent than the average fare being charged in the United States despite the fact that it is generally recognized that the Twin City railway service and equipment are as good or better than any other.

The average increase in the general price level of this country between 1913 and 1928 is approximately 60 per cent. In other words, it takes $1.60 today to buy goods costing but $1 in 1913. Applying this percentage of increase to street railway fares we find that an 8-cent fare would be the equivalent of a 5-cent fare before the war, but practically all of our patrons are paying only 6⅔ cents.

St. Paul and Minneapolis are growing, but this growth and the street car travel incident to it does not begin to offset the decrease in patronage. From 1920 to 1927 the population of the Twin Cities increased 10 per cent. During this same period revenue passengers decreased 25 per cent and passenger automobiles registered increased 102 per cent. And this 25 per cent passenger decrease occurred in the face of a determined and sustained advertising and promotional effort on the part of the company to increase street car riding.

If good street railway service is to be maintained it is not possible for the company to cut operating expenses in proportion to the decrease in revenues. Some service must be furnished which is not self-supporting. Therefore, the company's only recourse at this time is to ask for an increase in the street car fare.

Post Graduate Courses in Louisville

The Louisville Railway, Louisville, Ky., recently held a second session of its post-graduate course for trainmen at which 85 attended. Examinations were taken by 82 men; 75 passed with a grade of better than 60 per cent, eighteen of whom made an average of more than 90 per cent. Of this number twenty were trainmen who had been in service three months and, of course, under the educational system it was compulsory for these men to attend. Sixty-five men attended the school of their own volition.

Pressing Problems in Seattle

Municipal railway debt not to be foisted on city. Avery plans retrenchment. Taxi franchise up again

SEATTLE'S remaining railway debt of approximately $11,000,000 will continue purely as a utility obligation against the railway system itself, according to a decision handed down Nov. 5 by the Circuit Court of Appeals in San Francisco. The decision was given in the suit of the Puget Sound Power & Light Company, in which the company sought to compel the city to resort to the general tax fund for maintenance of the railway. Under the ruling all efforts have failed to make the debt a general obligation upon the city because part of the street car revenues are used for the payment of salaries and current expenses.

Arthur Schramn, assistant corporation counsel, who assisted his chief T. J. L. Kennedy in arguing the case during a session of the Circuit Court in Seattle on Sept. 13, declared that the decision "contraverts the contention of the Puget Sound company that it holds a pledge in gross upon the Seattle railway revenues for the bonds which the city gave at the time the system was purchased." This contention was presented in a suit brought in January, 1927.

As a result of the recent joint conference between Mayor Frank Edwards, G. B. Avery, superintendent of city utilities, and members of the utility committee of the City Council called to discuss railway problems following the recent death of D. W. Henderson, former superintendent of railways, it was agreed to give Superintendent Avery free rein in his plan for reorganization of the railway department. Temporarily, at least, Superintendent Avery will be in charge.

Mr. Avery plans to create four divisions in the railway department, under which Roy E. Furse, present acting general superintendent, will become superintendent of the transportation division; A. E. Pierce, superintendent of the track maintenance division; A. H. Campbell, superintendent of the shops division, and Allen B. Hiatt, superintendent of the accounting division. Abolition of approximately 25 positions in the railway department is contemplated including a cut of one-half in the force of fourteen inspectors and a heavy reduction in the track maintenance division. Further reduction of operating costs aggregating $300,000 annually will result from a rerouting of car lines which he proposes.

Seattle voters will probably be asked to decide whether the city's deeply involved railway system should be leased to private operators, even if Mayor Frank Edwards and City Council members favor the leasing plan proposed by Karl H. Kaye. Mr. Kaye, member and representative of a group of investors, has offered to lease the railway system for 50 years, on a basis of 25 per cent of its net earnings, and to turn it back to the city debt free at the end of that time. He also seeks an exclusive franchise for the operation of taxicab and for-hire car service in Seattle for the same period, in order that the entire transportation system of the city may be harmonized. The Kaye proposal is to be considered at a general discussion of the railway problems by the Council and Mayor Edwards shortly. Pending a decision on the Kaye proposals, all other negotiations for an exclusive franchise on the taxicab service of the city, notably the application of Sam T. Taggart, which has been on file with the city for some time, will be suspended. Moritz Thomsen, widely known Seattle capitalist and business man, has announced that he is prepared

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to give his financial as well as moral support to the proposed Taggart taxicab ordinance. Mr. Thomsen declares he is convinced that it provides a solution for some of the city's pressing transportation problems. The proposed ordinance would grant a 40-year franchise exclusively to Mr. Taggart, who operates the Red Top cab fleet, and return to the city 2 per cent of the gross receipts. It provides for the purchase by Taggart of all existing taxicab businesses.

Aid of the organized employees of the municipal railway system in bringing about a general financial and physical survey for the railway department to determine its status and needs before any drastic policy is carried out, is suggested by Councilman Otto Case. He has asked the Street Car Men's Union to join with him in asking for a general survey of the entire situation.

Prizes Awarded in Illinois Station Beauty Contest

The Illinois Terminal Railroad System, electrified lines, has announced the winners of its station beautification contest conducted during the past summer season. In order to secure wide distribution of the prizes, the contest was divided into divisions, cash awards being made to the stations in each division making the best appearance by the planting, cultivation and care of flowers and grass, and also to the stations showing the best utilization of possibilities. There was also a grand prize for the station from all divisions which in the opinion of the judges made the best rating both in appearance and best utilization. This high award went to the station force at Gillespie, Ill., composed of Mr. and Mrs. E. Blauer, H. Johnson and R. D. Hays.

Ohio Roads Seek Fare Increases

The Lake Shore Electric Railway and the Lorain Street Railroad have filed a request with the Ohio Public Utilities Commission for an increase of 5 cents in the fare between Lorain and Elyria. The present fare is 15 cents. Some time ago the commission granted the companies the right to raise the city fare in Lorain from 5 to 8 cents.

Windsor Radial Line Does Well

Fares on the street railway system at Windsor, Ontario, cannot be reduced at the present time but if present revenues continue a reduction will be made at "some future time," W. R. Robertson, superintendent of Ontario hydro radial lines, told members of a joint transportation committee recently. A year or so, he said, may be sufficient to wipe out deficits. A motion made by Clyde Curry, Alderman, calling for the sale of nine tickets for 50 cents went over to another meeting to be held in two weeks, after members study a financial statement, copies of which are to be sent by Mr. Robertson to each Municipal Council.

New Street Car Loading Plan in Vancouver

Use of automatic traffic signals has necessitated a change of policy in the handling of street car loading by the British Columbia Electric Railway Company, Vancouver, B. C. Loading berths for two cars have been established on all four sides of points where these traffic signals have been erected.

Some loading zones or platforms were used only as two-car loading berths during the rush hours, prior to the erection of traffic signals. At other hours during the day a car which had stopped in the second berth would stop again in the first berth to pick up any passengers standing there. Under the plan now in effect cars which stop in the second berth during all the hours of the day will not stop again at the first berth if the automatic signals will permit them to follow the first car around the bend or across intersections.

Omaha Grant Accepted

Railway ready for rerouting. Negotiations for sale of bridge between Omaha and Council Bluffs to cities to be resumed

THE Omaha & Council Bluffs Street Railway, Omaha, Neb., has accepted the 30-year franchise granted by a three to one vote of the people of Omaha on Nov. 6. Within a short time committees representing civic organizations and the Council will take up with the management a rerouting of the lines in the belief that by this means revenues of the company can be materially increased, and the people served better. The present layout of the lines is not satisfactory to the company or to others, as many recent developments have tended to negative the value of routes established years ago.

Mayor Dahlman will also appoint a committee of officials and citizens to negotiate with the company for the sale to the two counties in which Omaha and Council Bluffs are located of the bridge across the Missouri River, over which street car and public traffic are carried. The voters in Council Bluffs approved a $400,000 bond issue to build that town's part of a new free bridge, but the proposal was beaten in Omaha, by 4,000 majority, where an $800,000 issue was submitted.

President Shannahan of the railway is credited by the local newspapers with having won the people over to confidence in the company and a desire to assist it out of financial difficulties. He says the company will enter into negotiations for the sale of the bridge, but points out that the proposal to charge the company for using the structure after the public becomes the owner is unfair. If it is really to be a free bridge the railway should operate over it without any tax as any rental would force the company to impose that rental on passengers in terms of fare and that this would result in the impossible situation of street railway passengers paying tolls while auto and bus passengers and others would ride free. The railway now pays the bridge company $60,000 a year rental.

Refinancing plans for the railway may be held in abeyance pending the settlement of this issue since the price and the other details of transfer of the bridge are likely to have a direct effect on net income. Under the agreement for their extension, bonds of the company still have two years to run before they mature.

Case of Kansas City Company Before Council

At a meeting of the board of directors of the Kansas City Public Service Company, Kansas City, Mo., on Nov. 13, a report on the railway situation in Kansas City was approved to go before the City Council, probably on Nov. 19. The report is not in the nature of an application for a 10-cent fare or any other specified rate, but it states the facts in the situation as seen by the company and shows that since the city wants certain improvements made and the company would like to increase the wages of its employees, these things can perhaps be accomplished with an advance in fare, with 10 cents cash apparently the most logical rate.

To acquaint the public with the facts the board of directors authorized that the report be published in installments in the local press as advertisements.

One-Man Cars on Four Lines in Oakland

Authority has been granted by the California Railroad Commission to the Key System Transit Company to operate one-man street cars on four lines, all in the city of Oakland, Alameda County.

Safety Rewarded in Milwaukee

Bronze medals denoting completion of six consecutive months of safe railway operation were presented on Nov. 9, to 850 trainmen of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. The presentations, made by division superintendents at the various car stations, marked the first milestone in a safety contest entered by the company's 1,700 motormen and conductors on April 1, 1928.

Silver medals will be awarded trainmen after twelve consecutive months of safe operation, and gold medals after two years. Trainmen who have chargeable accidents at any period of the contest must start anew to earn the gold award. Every accident, no matter how trivial, is recorded and only those in which trainmen are clearly not to blame are eliminated in determining the safety awards.

The medal is in the form of a small shield, to be worn on the lapel. A gold watch chain is attached.

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Sympathy from Seattle Car Men

More than 2,000 old friends and workers of David W. Henderson, superintendent of the Seattle Municipal Railway, Seattle, Wash., who died on Oct. 27 in that city, attended his funeral on Oct. 30. Hundreds of motormen and conductors were present in the uniform which Mr. Henderson wore for years when he was employed by the Puget Sound Railway & Power Company, and from whose ranks he worked up to the head of the city's railways. Among the hundreds of floral pieces was a gigantic emblem, a replica of car No. 312, which he drove over Queen Anne Hill for many years. This was made of yellow chrysanthemums, with the windows blocked in white and the borders in dark flowers. It was a tribute from the men with whom he worked.

Mayor Wants Subway to Northeast Philadelphia

Mayor Mackey of Philadelphia declares that transit is the crux of the northeast situation and he wants to see transit lines pushed rapidly into the open spaces to the county line. He has in mind a $30,000,000 subway along Bensalem Avenue from Broad Street to the city limits.

For the 80 per Cent Who Use Philadelphia Street Cars

PRESIDENT SENTER of the Philadelphia Rapid Transit Company, Philadelphia, Pa., has addressed a letter to all members of the P.R.T. family, requesting their closest co-operation in this effort to speed up the general movement of traffic. The entire organization will be keyed up for a united effort along this line. Operators of cabs and buses under Philadelphia Rapid Transit direction have been instructed to keep off the street car tracks unless it is absolutely necessary to drive there. The company says a similar appreciation by motorists and drivers of commercial vehicles of the need for keeping the car tracks open will aid tremendously. It is the hope of the company that the forthcoming advertising campaign in behalf of the 80 per cent will bring about an intelligent appreciation of mutual problems and will help to loosen the strangling grip of traffic congestion on the city streets.

Mr. Senter's letter follows in part:

P.R.T. has planned another campaign in the interest of the car-riders of Philadelphia, who constitute 80 per cent of the total users of our city streets.

Extreme traffic congestion in the central business district is already seriously hampering us in our task of transporting 2,500,000 riders daily, and when this congestions is increased by the Christmas shopping season efficient operation and close adherence to schedules will be still more difficult. There is no doubt that this year will bring the heaviest street traffic we have ever experienced.

Almost unlimited parking privileges, loading and unloading of trucks and numerous grade crossing interruptions are some of the things which daily cause so much delay to the car rider. Such snow storms as are experienced this year will, of course, greatly add to these difficulties.

Churches, civic bodies, business and improvement associations, and fleet truck owners throughout the city will be asked to co-operate with us in speeding up transit service. Coal dealers will be asked to help by not making deliveries during the morning and evening rush hour periods. Motorbus and taxicab operators will do their share by keeping clear of car tracks. Our supervisory forces will offer all the relief possible in cases of blockades and irregular car spacing. The aid of P.R.T. and M.B.S.C. stockholders will also be sought.

Advertising will appear in the daily newspapers, and folders and signs in cars, buses and cabs will be used to refresh the minds of the public on the causes of these delays, which are beyond our control.

Management is thus doing everything in its power to win the co-operation of the public. Every employee-owner, especially those manning our cars, buses and cabs, should do his part in rendering to the 80 per cent transportation as efficient as traffic conditions will permit.

Numerous opportunities will be afforded during these trying periods of operation to display courtesy, patience and salesmanship. P.R.T. employees, however, have never failed to rise to the occasion, and these are the things which I know you will give to the fullest extent. The willingness to do just that little bit more has made P.R.T.'s position in the transportation world such an enviable one. Be worthy of it this winter.

An announcement in the New Orleans dailies about the discerning patrons who ride the street cars

W. A. Draper in Aviation

Walter A. Draper, president of the Cincinnati Street Railway, Cincinnati, Ohio, is one of the principal backers of the new Cincinnati Aviation Industry, incorporated on Nov. 12 at Columbus. It will manufacture airplanes, airplane motors and equipment in a factory to be built adjoining the Cincinnati Municipal airport. It has acquired the manufacturing rights, designs and patents of the Dietz Experimental Laboratories, Dayton, Ohio. It is anticipated that Mr. Draper will be named president.

Interest in Community Fund in St. Louis

The Community Fund drive in St. Louis, Mo., will be in charge of a special committee so far as the activities of the St. Louis Public Service Company is concerned in this enterprise. Department heads will act as chairmen of subcommittees to be selected by them from the employees of their departments. Samuel Greenland, general manager, recently stressed the point that the collection was for a good cause, and as a matter of pride it was incumbent on the railway to make a creditable showing. The campaign dates have not yet been announced.

Agreement Reached on Stupendous Newark Undertaking

After more than a year of negotiation the city of Newark reached agreements on Nov. 15 with the Pennsylvania Railroad and the Public Service Co-ordinated Transport on contracts providing for construction of a new railroad station, additional trackage, extension of the Hudson Tubes to Parkhurst Street in the south end of Newark, the building of a rapid transit trolley line in the bed of the abandoned Morris Canal, with a terminal beneath the new railroad station, and the opening of new streets and boulevards to hook up with the station plans. The whole project will cost nearly $25,000,000, with the railroad spending more than $10,000,000 and the city the balance.

Under the original plans worked out by railroad and trolley officials before Mayor Raymond died, Oct. 7, the city was to bear the cost of constructing the trolley terminal under the railroad station. At a conference on Nov. 15 at the Newark City Hall the railroad agreed to pay this part of the expense, providing the city gave up its effort to have the railroad pay for a new street on the east side of the new station.

President McCarter of Public Service is said to have agreed to pay the city a yearly rental of $125,000 for use of the canal bed trolley line in addition to the franchise tax of 5 per cent on gross receipts which it now pays. Originally the trolley company wanted to pay 4½ per cent of the cost of construction with the franchise taxes deducted.

The city of Newark plans to construct a 100-ft. street west of the railroad for more than a mile and to build and rearrange other streets in the vicin-

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ity of the station and the new tube extension station.

The project will take more than five years to complete. When it is finished Manhattan Transfer on the Kearny Meadows will be abandoned and transfers of passengers from electric to steam trains and vice versa will be made at Market Street, Newark, the site of the new station.

P.R.T. Wants New Lease

The temporary lease of the Broad Street subway to the Philadelphia Rapid Transit Company, Philadelphia, Pa., expires on Nov. 30. Operation is resulting in a loss to the company of $10,000 a day. The P.R.T. feels it impossible to continue operation after Nov. 30 on the present terms. That is the substance of the formal notification sent by the company on Nov. 9 to Mayor Mackey.

One of the questions which President Senter of the company propounds is "How should this burden properly be borne?" He says in part:

The city has constructed a $100,000,000 subway which has added many millions of dollars a year to the cost of supplying transit to the people of Philadelphia without providing the revenue necessary to support it. That revenue can come only from the taxpayer by way of the city treasury, from the car rider by way of fares collected, or from both.

P.R.T. car riders now support the transit system in its entirety, aside from the Broad Street subway, out of fares collected. They can do more only if called upon to pay an increased fare. But why should the car rider be asked to pay the cost of a facility from which the greatest financial benefit goes to the real estate owners, the business interests and the city?

Mitten Management, faced with a similar situation in 1920, fought against a departure from the basic 5-cent fare, because we recognized the loss in riding which would follow a flat increase in fare. When the increase was forced upon us, P.R.T. lost 100,000,000 passengers the following year, almost three times as many as the $100,000,000 Broad Street subway will carry in 1929. For all these reasons Mitten Management will be found fighting on the side of the car rider.

As the Philadelphia *Ledger* sees it, this notice by the railway creates an acute situation. That paper says:

Somehow the city must solve a problem that includes the question of the city tax rate as well as the future usefulness of this $100,000,000 city investment. Philadelphia cannot afford and will not narrow the present wide gap between subway earnings and operating costs.

Taxpayers are now reaping the benefits of the city's high-speed transit facilities in the form of increased property values. The city is getting an increased tax revenue from the rise in these values. Car riders are now carrying as large a burden in carfares as they should.

In the face of this situation, the Mayor and Council should quit the "policy of drift" that has been followed and adopt a fair, business-like attitude looking to a just apportionment of the first costs of an improvement that will ultimately be of great value to the whole community. It stands now as a burden, for whose support no preparations have been made.

Survey Under Way in Pittsburgh

Allied Boards of Trade submit questionnaire to Pittsburgh Railways intended to be the basis for future study there. Query covers bus operation.

THE Allied Boards of Trade at Pittsburgh, Pa., has made public a list of questions put to A. W. Robertson, president of the Philadelphia Company and the Pittsburgh Railways, as part of the plan of a committee designated to make inquiries into the transportation situation in the city of Pittsburgh and its environs. An offer was made to arrange a joint meeting. The allied bodies, through a sub-committee of the transportation committee, queried the railway executive on many points of company financing, salaries and operating methods. The board said:

We are submitting the list of inquiries for the purpose of developing the situation. It is to be understood that the appointment of this committee and its resulting inquiry are prompted by a volume and number of complaints which have reached our body with reference to the quality and quantity of service furnished by the transportation company, together with disquieting rumors of operating losses. The list of queries follows:

1. *Ownership*—What is the stock and bond structure upon which interest or dividends are being now paid, or on which interest or dividends are accruing as a liability?

2. *Comparison* — Compare the present stock and bond structure with that existing as of Jan. 1, 1926.

3. *Byllesby Engineering & Management Corporation*—

A. What is the relation between the Pittsburgh Railways, the Philadelphia Company, and the Byllesby Engineering & Management Corporation?

B. What contracts, if any, exist between the Pittsburgh Railways, the Philadelphia Company, and the Byllesby Engineering & Management Corporation?

C. If no contracts, written or oral, exist, then what business relations are maintained between the Pittsburgh Railways, the Philadelphia Company, and the Byllesby Engineering & Management Corporation?

D. Does the Byllesby Engineering & Management Corporation manage the operation of the Pittsburgh Railways directly or indirectly?

E. If so, what remuneration or consideration is paid for this service?

F. Does the Byllesby Engineering & Management Corporation receive a percentage out of the income of the Pittsburgh Railways?

4. *Maintenance, new construction and improvements*—

A. What, if any, contracts exist between the Pittsburgh Railways, the Philadelphia Company, and the Byllesby Engineering & Management Corporation, covering maintenance, new construction and improvements? What emolument or consideration is received by the Byllesby Engineering & Management Corporation on sums expended for such work?

B. Is this consideration or emolument always for actual service rendered, and does the company receive full value for the sums so expended?

C. Is such payment a charge against the income resulting from the operations of the railways system?

D. Does the Byllesby Engineering & Management Corporation use its own capital, or are these improvements or additions made by the use of the capital or income of the Pittsburgh Railways?

5. *Finance*—

A. What, if any, contracts or arrangements exist between the Pittsburgh Railways, the Philadelphia Company and the Byllesby Engineering & Management Corporation in reference to financing the Pittsburgh Railways or any of its subordinate companies?

B. Does your company make financing cost a capital charge or is it paid out of the operating income?

C. Is this consideration or emolument always for actual service rendered and does the company receive full value for the sums so expended?

D. Is such payment a charge against the income resulting from operations of the railway system?

6. *Inter-company relations*—

A. What proportion of the income of the Pittsburgh Railways or its subsidiaries is absorbed by the other companies or corporations controlled by the Philadelphia Company or other companies controlled by or controlling the Philadelphia Company?

B. What contract, if any, now exists for the furnishing of power to the Pittsburgh Railways? How does this compare with the contract in force in 1926?

7. *Compare your total inventory as of today (nearest period) with your total inventory as of January 1, 1926.*

8. A. *What is the basis of the statements credited to your Mr. Fitzgerald asserting a loss of $60,000 a month in the operations of the railway?*

B. How does this compare with your operating results during the year 1926?

9. A. *Is your company willing to furnish the public a list of the salaries paid to its salaried officers? If so, does it?*

B. Compare these with salaries paid as of Jan. 1, 1926.

10. *Street car facilities*—

A. Does your company contend that the present railway facilities are adequate for public needs?

B. Does your company contend that they cannot afford to furnish better facilities to the public at the present 8½-cent rate of fare?

11. *One-man cars*—

A. Do your records show by increase of accidents that the hazard to the public is greater through operation of one-man cars?

B. Does the use of one-man cars result in slower traffic and delays to the public?

C. Do you not operate the one-man lines with substantially the same number of cars formerly manned by two men?

12. *Buses*—

A. Does your company contend that the 25-cent fare is necessary to operate buses at a profit?

B. Is not your fare very much in excess of that charged in other cities of like topography? If so, why?

C. What amount of percentage of the income from bus lines is consumed in salaries, other than wages paid to operatives?

D. Has the Pittsburgh Motor Coach Company been operating at a profit since Jan. 1, 1928?

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$30,000,000 Northern New Jersey Line

The North Jersey Transit Commission, on Nov. 15 decided to ask the New Jersey Legislature to authorize the immediate financing of a $30,000,000 rapid transit line between Newark and Paterson. This is the first step in the commission's program to link nine counties of northern New Jersey in a comprehensive system of rapid transit.

No suggestions as to the method of financing the plan will be made in the official request, but the commission has already opened negotiations with officials of the Erie Railroad for the use of the Erie tracks between Newark and Paterson and hopes to reach a satisfactory agreement before the Legislature convenes in January.

The proposed line, according to members of the commission, would save from twenty minutes to an hour in the traveling time between the two towns. By bus and trolley the time now required for the trip are 55 and 91 minutes respectively, as against the 36-minute schedule which the commission plans to operate.

The Newark-Paterson line is the first "leg" in the system planned by the commission to link the country seats and principal towns of Bergen, Hudson, Passaic, Essex, Union, Monmouth, Middlesex, Somerset and Morris Counties with rapid transit service, augmented by bus and trolley lines into the less thickly populated districts.

The commission, was created by the Legislature six years ago to study plans for the development of transit facilities in the northern end of the State. In February, 1927, it recommended the establishment of a transit loop, or belt line, linking New York and New Jersey. Some time later the problem of interstate transit was turned over to the Suburban Transit Engineering Board and the North Jersey Transit Commission was left free to formulate a transit plan for Northern New Jersey.

Changes on *Electrical World* Staff

W. H. Onken, Jr., has been appointed senior editor of *Electrical World*, a McGraw-Hill paper. He has been connected with the organization since 1900. In 1906 he became managing editor of the publication and was made editor in 1916. His wide acquaintance throughout the electric light and power industry and his intimate familiarity with its problems have been important factors in bringing *Electrical World* into its present authoritative position in the electrical field. The position of senior editor will enable him to devote his editorial talents and knowledge of industry with greater freedom to special industry problems and to other editorial duties in the McGraw-Hill Publishing Company.

L. W. W. Morrow, managing editor, has been appointed editor with full authority and responsibility for the editorial conduct of the paper. Mr. Morrow joined the staff in 1922 as associate editor, coming directly from the electrical engineering department of Yale University. Prior to that experience, he was director of the school of electrical engineering in the University of Oklahoma. He was appointed managing editor of *Electrical World* in 1925.

Allen M. Perry, recently associate editor, becomes managing editor. In his fifteen years' service with the paper, Mr. Perry has been field man, junior and senior engineering editor, Western editor and associate editor at the home office.

Brooklyn Company Sells Interborough Holdngs

As *Barron's* sees it the change in ownership by which the Brooklyn-Manhattan Transit Corporation divested itself of its holdings of Interborough stock is likely to have important bearing on New York traction mergers. Procedure by a strong group of stockholders would probably have been different from that which present officials of the company will probably take. In the one case profit on securities held would have been the main consideration; on the other hand, maintenance of present official positions is likely to dictate policy. In other words, if Interborough wins its 7-cent fare case the officials will probably not enter negotiations with the city with a view to merger of that property with the new city system and B.-M.T. properties. A 7-cent fare will probably prevent an I.R.T. receivership, and with that achieved the officials are not likely to risk loss of control in a merger.

To *Barron's* it seems likely that, Chairman Dahl, Chairman Wiggin of finance committee and their associates, said to have working control of Interborough Rapid Transit at such time as the Interborough Rapid Transit stock was released from voting trust agreement (last year), parted with their holdings also. It was brought out in hearings before Transit Commission last year that Gerhard M. Dahl held 6,600 voting trust certificates of Interborough Rapid Transit and that Waubesa Corporation, in which Mr. Dahl was interested, also held 6,600 certificates. A. H. Wiggin held 3,000 certificates and Thomas L. Chadbourne, associate of Mr. Dahl, had 9,800. Says the source quoted:

The B.-M. T. is an able management and there is no reason why it might not get the contract for operating the new subway system if B.-M. T. rapid transit lines are merged with the new system being built by the city. Again, as part consideration for favorable action by B.-M. T. in reaching agreement as to merging its subway and elevated lines with the city, the latter might be induced to look with favor on a merger of the company's surface lines with Brooklyn City Railroad, or at least award it the franchise for bus routes in Brooklyn. If Brooklyn City and B.-M. T. surface lines were merged and proper 5-cent fare zone laid out, surface lines in Brooklyn could be put on a paying basis.

Bigger and Better Records in Chicago

THE increase in the number of riders on Chicago's street railways, which amounted to 26,322,000 rides for the first nine months this year compared with a similar period in 1927, has attracted attention as offering further concrete and tangible evidence indicative of the importance of the street car in the populous centers.

Each month this year has set a new record in total rides for that month, although there were slight decreases in revenue passengers in April and June compared with corresponding months in 1927, according to figures furnished by the Chicago Surface Lines.

The increase for the nine months, according to these statistics, is more than twice as many rides as the total annual increase of 1927 over 1926. This demand has been met by schedule revisions and additions to the rolling stock of 27 city lines.

German Visitor Says Railway Is Backbone of Transportation

Motion pictures of traffic congestion in leading American cities are to be used by officials of German electric railways as a warning of what may occur in Germany if the growing traffic problem there is not met at once.

Dr. Phillip Kremer, assistant to the general manager of the Berlin street railways, sailed on the *Columbus* recently for Germany with a set of films which he had made in several cities within six weeks.

Traffic congestion is increasing and the number of automobiles is expected to double within the next year in Germany, Dr. Kremer said on sailing. He added that he would recommend that street cars be continued as the backbone of Berlin's transportation system. The system now uses 3,500 cars and 600 buses, and he said he believed this proportion was about correct. He said:

We are going to use the street car as the major means of transportation for the dual reasons that we can carry passengers cheaper by car than by bus and that the car causes less street congestion. I came to the United States with an open mind on this question, and I am returning firmly convinced that the American method of using the bus as a supplement service only is the proper one.

A Tramway Jubilee

The Nottingham Tramways, Nottingham, England, completed a half century of existence on Sept. 17. It was in 1878 that the first horse cars were put into service in the town. They were single-deckers, and each seated 24 passengers. The Town Council took over the undertaking in 1898 and now there are 200 electric cars, 76 buses and twelve trackless trolleys.

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Foreign News

Berlin Consolidates All Transportation Lines

The City Council of Berlin has voted to consolidate under one management the rapid transit surface car and bus lines in the city.

For some years, the city has owned the surface lines outright, as well as a large controlling interest in both the rapid transit system and the Berlin General Omnibus Company, which controls all bus operation in Berlin. Separate corporate management was retained for these three undertakings, but their general policies were determined by a central commission. Now there will be actual consolidation, which it is expected will bring about a number of economies. In 1926 the division of traffic between the different agencies was approximately 813,000,000 passengers carried by the surface lines, 113,000,000 by the bus lines and 163,000,000 by the rapid transit lines. It is expected the consolidation will go into effect on Jan. 1, 1929.

Poland Extends Railways

Extensions of electric tramways and light railways in Poland are being made. The Société des Tramways Electriques du Bassin de Dombrowa, a Belgian firm, has recently completed and opened to traffic a number of lines in the Dombrowa district. The Société des Chemins de Fer Electriques Suburbains, another Belgian firm, has completed a line 20 miles in length in the Warsaw district.

Ninth Report from Melbourne

For the year ended June 30, 1928, the total revenue of the Melbourne & Metropolitan Tramways Board, Melbourne, Australia, was £2,494,100 compared with £2,505,855 for the previous year. Receipts from passenger fares totaled £2,476,644 compared with £2,487,573 for the preceding year. This decrease and failure to obtain the "normal" increase in revenue which usually follows the yearly increase in the population of the metropolis is attributable, according to the report of the Tramways Board, to the prevailing industrial depression and increasing use of the private motor car, particularly during the week-ends. Passengers carried totaled 220,353,333 compared with 224,211,867 for the previous year.

The traffic receipts per bus-mile of the Williamstown bus service were 14.79 pence, resulting in a loss of approximately £3,000 on the year's operation after making provision for standing charges, interest, and reserves. The Balwyn bus route showed a loss for the year of approximately £6,000.

Total working expenses amounted to £1,722,967 compared with £1,777,107 for the previous year. The net surplus from operation was £771,133 and when carried to the appropriation account was reduced to £445,178. After consideration of appropriations there was a deficit of £27,061 met by transfer from general reserve fund and balance brought forward from the previous year.

A reference is made to the conversion to electric traction of the Richmond Cable Tramway, opened on Dec. 4, 1927.

Improvements in Rio de Janeiro

Program for track improvements including paving, repairs, and extension of lines is being carried out consistently by the Rio de Janeiro Tramway, Light & Power Company, Ltd., and the affiliated Jardim Botanico company. These two companies laid nearly 16 kilometers of new lines and relaid 49 kilometers during the year ended June 30, 1928. During the year 49 per cent of the cars of these two companies were repaired and repainted. The distance between stopping places for trams has been modified, the average being 200 meters, which greatly assists in accelerating the movement of traffic.

Swiss Railways Show Great Progress in Electrification

Roads make best showing recorded in any year since 1913. Passenger receipts make new high record

WITH the conversion of an additional 109 miles of line to electric traction in 1927, the total length of electrified mileage of the Swiss Federal Railways is now 1,035 miles, or approximately 58 per cent of the total length of the system, namely, 1,791 miles. In 1922 only 12 per cent of the total length was electrified, so that progress has been remarkably rapid. Naturally this development has been stimulated by the excellent water power facilities in Switzerland.

Electric train mileage rose last year by about 25 per cent, compared with 1926, but the cost of electric power rose only 15 per cent, a result which is considered to be due chiefly to the more efficient utilization of current. All the main arteries of railway traffic in Switzerland are now electrified, and about 94 per cent of the total power required is produced by the Federal Railways Administration at its own power stations. These are in two groups—one in the Gothard district and the other in Valais. A notable feature is the great fall in the cost per unit which occurred as the scale of electrification was extended so swiftly. Conditions have been fairly normal in this matter since 1924, and a comparison starting from that year shows a sharp fall in the cost of energy from 9¼ centimes per kilowatt-hour in 1924 to 5⅜ centimes in 1927. It is calculated that the saving in fuel costs consequent upon electrification has been very large.

The Swiss railways have been shielded from severe road competition by the nature of the territory served and the introduction of improved travel facilities. Such competition as has been encountered appears to have affected freight traffic rather than passenger business, for the proportion of gross railway revenue derived from the latter class of business has actually risen slightly of recent years—from 33 per cent in 1924 to more than 36 per cent in 1927. On the other hand, the ratio of freight revenue to the total has fallen over the same period from 60 to 55 per cent. The total receipts of the system in 1927 were 395,000,000 francs, and it is estimated by the administration that were it not for road competition they would have been 36,000,000 larger.

Partial reduction of freight tariffs have, however, had a beneficial effect on the financial position of the system, for they have led to a big rise in the tonnage transported, which was 17,813,000 in 1927, a steady rise from 13,245,000 tons in 1922. At 12¾ francs per ton, the average receipts from freights in 1927 were lower than for several years, owing to reduced charges, but, as a result of the big growth of traffic, the total receipts are among the best recorded in the history of the system. Passenger receipts, moreover, set up a fresh high record, and undoubtedly the enterprising advertising policy which the administration adopts in order to attract foreign tourists is a powerful factor in this satisfactory showing.

After allowing for working expenses, which are being kept well within bounds, and for debt interest, which has been increasing rather rapidly of late, the surplus from 1927 operations was 21,000,000 francs—the second best result since before 1914, and almost as good a surplus as that realized in 1913, when debt charges were very much smaller.

London Paper Changes Name

The Electric Railway, Bus & Tram Journal is the new name of the well-known *Electric Railway & Tramway Journal* of London. The new name appears with the issue of Oct. 12, 1928. An editorial explanation says that tramways are still the only possible vehicles for the cheap transportation of great masses of people who have to travel by necessity at the peak hours, but there are many tramway systems which also need a more mobile vehicle. On some such systems motor bus service will replace the cars.

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Recent Bus Developments

Situation Due to Withdrawal of Detroit Jitneys Well in Hand

Del A. Smith, general manager of the Department of Street Railways at Detroit, Mich., is of the opinion that the situation created by the withdrawal of the jitneys is well in hand. He was confident additional equipment obtained by the railway department would meet any demand placed upon it. He said that so far as transporting passengers was concerned a normal condition had been established.

Mr. Smith is seeking to improve service on all lines, but particularly on Woodward, Jefferson, Grand River Avenues and Fort Street. On these arteries many persons formerly were served by the jitneys.

Mayor John C. Lodge has approved the rental of the additional equipment from Cleveland, although the figure at which these cars are to be rented has not been determined. The cars were shipped from Cleveland over the interurban lines and are now in regular service in Detroit.

Between Hackensack and Rutherford by Bus

Abandonment of the Public Service Co-ordinated Transport Company's trolley line between Hackensack and Rutherford, as contemplated by five of the affected municipalities and the company, has been approved by the Bergen County Board of Freeholders at Hackensack. The trolley line to be taken up is part of the route between Newark and Hackensack. Three of the communities have already completed arrangements with Public Service. They are Hackensack, East Rutherford and Carlstadt. Woodridge and Hasbrouck Heights are now negotiating.

It is planned to substitute an adequate bus service on the route. Public Service, it was said, was losing money on the line.

Normal to Have New Service

The State Railway Commission has granted the Lincoln Traction Company, Lincoln, Neb., permission to substitute bus service for car service to Normal, an eastern suburb. The proposal was opposed by the city and also by some of the people in the section served by the railway, which, when first built, cut diagonally across open country. This section is fairly well settled, but has little or no paving. In opening a street necessary to connect present paving with that contemplated the city would have inflicted an expenditure upon the railway which has no reserve for that purpose.

The railway commission took the ground that it was more interested in seeing railway service maintained than in paving, and that as the company could not be compelled to invest more capital in the enterprise, the case would be continued so as to permit an agreement to be made. This, however, was found impossible, and when the second hearing date arrived, the commission authorized the railway to take up the rails and to supply service by bus over paved streets to sections now without organized transportation routes.

Another Move in Knoxville Bus Case

The Knoxville Power & Light Company, Knoxville, Tenn., has placed a new bus proposal before the City Council's bus committee. The company is willing to establish four bus routes within the city. At the same time it has asked permission to abandon its Kingston Pike trackage from Third Creek west to the city limits. Bus service will be substituted on this route, under the plan.

> The City Council of Knoxville, Tenn., voted on Nov. 9 in executive session to consider the bus proposal of the Knoxville Power & Light Company carrying 7-cent car and bus fares.

The proposal comes as a result of an invitation from City Manager Otto Roehl for the company to clarify its position on this matter in order that disposition may be made of it in the Council.

A 7-cent fare would apply to any combination street car and bus line. Free transfers would be given.

The four bus lines proposed would penetrate the areas originally laid out for extension of transportation facilities. These are: One out Sevierville Pike; one northward to Whittle Springs territory connecting with the Sixth Avenue car line; one through Beaumont; another through West Lonsdale.

It is understood that the 7-cent fare comes nearer meeting the ideas of City Manager Roehl than the original 6-and-4 cent plan, the passenger to pay 6 cents on boarding the street car and 4 cents additional for his transfer.

Expansion by Pacific Electric

The Pacific Electric Railway has applied to the California Railroad Commission for a certificate of public convenience and necessity to operate auto stage service between Huntington Drive and Eastern Avenue in Los Angeles, and Commonwealth Avenue and Fremont Street in Alhambra.

Discontinuance Petition Dismissed in Indiana

A petition filed by the Evansville & Ohio Valley Railway to discontinue freight car service between Evansville and Mount Vernon, Ind., has been dismissed by the Public Service Commission on request of the petitioner. The line has been abandoned and motor truck service substituted.

Controversy Over Abandoned Ohio Territory

Another Eastern Ohio traffic controversy has been carried to the Ohio Public Utilities Commission for settlement. Objections were raised when the Youngstown & Suburban Transportation Company, subsidiary of the Youngstown & Suburban Railway, abandoned its bus lines between Canton and Salem, a run of 33 miles. It was under approval of the Ohio commission that this route was abandoned, and a new service begun in conjunction with the Stark Electric Railroad. Instead of buses every two hours out of Canton for Youngstown, Stark Electric cars now leave every hour, making connections at Salem with the Youngstown & Suburban buses for Youngstown. Through co-operation on the part of the two companies the service was doubled.

Hardly had the new service been started before two transportation companies filed petitions with the Ohio Public Utilities Commission, asking permission to operate over part of the route abandoned by the Youngstown & Suburban. The latter has protested to the Ohio commission, asking that petitions filed by the Warren-Salem Coach Line and the Salem-Akron Transit Company for passenger service certificates be denied.

Hearings on the original petitions for certificates are scheduled for early next month.

Survey Will Determine Possibilities of Bus in Memphis

Permission to establish a bus line in Memphis, Tenn., will not be acted upon by the city until a careful survey and study is made of other cities where trolley cars and buses operate. This statement was made by Mayor Watkins Overton on Nov. 13.

Application of an unnamed bus company for a franchise to operate in Memphis with a capital of more than $1,000,000, was to be heard by the City Commission, the Mayor said, but the matter will be taken under advisement until after the city's investigation is completed.

Statements of T. H. Tutwiler, president of the Memphis Street Railway, that his company would operate buses if a real need for them existed also will be considered by the City Commission before a franchise is awarded or denied, according to the Mayor.

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Financial *and* Corporate

Seeking to Lift Receivership

Another move to straighten out affairs of Second Avenue Railroad, New York, in court's hands since 1921

THE committee representing the holders of certificates issued by the receiver of the Second Avenue Railroad, New York, has made public a plan for terminating the receivership and reorganizing the company.

The committee bid in the property at the sale on Sept. 22, 1927. On confirmation of the sale it proposes to organize a corporation with a capital of 34,000 shares of no-par common stock, to which it is proposed to assign the bid so that a conveyance may be made directly to the corporation.

It is expected that the new company will be called the Second Avenue Railroad Corporation. Under the plan, for each $1,000 of receiver's certificates the holders will be allotted ten shares of the new company's stock. This allotment will require 31,400 shares, and the remaining 2,600 shares, or so much thereof as is necessary, may be used in the discretion of the committee, on the same basis, to satisfy the contract creditors whose claims are on a parity with the preferred certificates.

When the plan is consummated the property will have been fully cleared of the long receivership and the ownership and management will be vested in the certificate holders. Unless the holders of more than one-third in amount of the outstanding certificates of deposit within 30 days from the filing of the plan with the depositories file with the latter written notice of their dissent specifying the number of certificates held by them, the plan will become effective and will be binding upon all depositors.

A. W. Hutchins, acting for the committee, bid in the properties at the sale in September last year for $500,000, payable in receiver's certificates as autorized by the judgment of the Supreme Court of New York County on June 29, 1921, conditioned on the approval of the plan of Aug. 18, 1927, by the Transit Commission. This approval was denied by the commission by order dated Feb. 2, 1928.

Land and buildings owned by the railroad and covering the block bounded by 96th and 97th Streets and First and Second Avenues, were appraised by the Transit Commission in 1921 at cost less depreciation at $2,428,148, and are assessed for taxation on the 1928 list at $1,425,000.

The committee is informed that the receiver's accounts will show upward of $300,000 available for distribution to meet personal and property damage claims which have accumulated, to which will be added about $35,000, the proceeds of sale of certain real estate, and it is anticipated that the committee will receive sufficient moneys from this source to pay all its obligations, counsel fees and compensation, and effect the reorganization. In the event the amount received is not sufficient for the purposes, the committee will borrow any additional sum on mortgage of the property or a part thereof.

Receiver's certificates were outstanding to $3,030,000 principal amount at the judgment of June 29, 1921. This sum with $1,727,100 interest due and unpaid to Oct. 1, 1928, will run the aggregate to $4,757,100.

Lease of 10-Mile Electric Branch Authorized

The Interstate Commerce Commission has just announced that division 4 had approved a report and order authorizing acquisition by lease of the Chowchilla branch of the Visalia Electric Railroad, extending from a connection with the Central Pacific Railway at Chowchilla, Cal., to a point in block 42 of Dairyland Farms subdivision No. 2, a distance of 10 miles.

Separating Transportation and Power on Ohio Property

Application to buy the power and light properties of the Cleveland Southwestern Railway & Light Company, Cleveland, Ohio, was filed by the Reserve Power & Light Company with the Ohio Public Utilities Commission, on Nov. 9. The purchase price was given at $2,087,165. The properties are located in the counties of Cuyahoga, Medina, Lorain, Wayne, Richland, Crawford, Ashland and Morrow, and are located along the right-of-way of the Southwestern.

Interurban and motor coach transportation business of the Southwestern will not be affected by the purchase. According to attorneys of the company, F. H. Wilson, president and general manager of the Southwestern, is an official of the Reserve Power & Light Company. The application to sell the light and power properties is said to be the start of a movement to divide the power and transportation business into separate managerial organizations.

James Ketner a Kansas City Director

James Ketner has been elected a director of the Kansas City Public Service Company, Kansas City, Mo., operating the co-ordinated railway and bus service in that city, to succeed Herbert M. Woolf, who had asked to be relieved to conserve his time for his many other interests, among them an expanding group of stores and a growing chain of theaters.

$5,000,000 Bond Issue in New Orleans

The Commission Council of New Orleans has approved the $5,000,000 bond issue of the New Orleans Public Service, Inc. The proceeds of the sale, which is expected to realize approximately $4,600,000, will be devoted to the retirement of a bond issue in connection with the purchase of the Edison Electric Company and improvements. The bond issue to be retired amounts to $2,000,000 and about $2,500,000 will be used for improvements.

In connection with the bond issue Commissioner of Public Utilities Hall submitted a report from R. V. Whittaker & Company, auditors for the department, showing the financial condition of the company and approving the issue. Only that part of the proceeds of the bond sale actually used for improving the company's facilities will be added to the capital rate base.

The auditing firm also submitted a report on its investigation of the opposition of the company to the Fernandez bills before the last session of the General Assembly. The auditors said the money spent was a legitimate expense. It amounted to slightly more than $6,000. Of that sum $4,500 went to W. A. Porteous, Jr., an attorney regularly employed during sessions of the Legislature, and $2,485 to Forrest Pendleton, another representative. The bills in question were designed to give the city of New Orleans the right to acquire all property of the Public Service.

The New Orleans Public Service, Inc., supplies electric power and light, natural gas and street railway service in the city of New Orleans. In 1922 a settlement was effected with the city under the terms of which the sum of $44,700,000 was agreed upon as the value of the properties in the system as of Dec. 31, 1920, for the purposes of the settlement, to be increased by future investments in the property. The settlement ordinance provided for the allowance of such rates for the company's various public services as would produce a 7½ per cent return on the rate base as determined from time to time, after operating expenses, taxes and reserve for renewals and replacements.

The rate base as at Sept. 30, 1928, was in excess of $79,800,000, upon which the present allowed return, before deducting appropriations for renewal and replacement reserve at the current rate of $1,866,000 per annum, is about $7,851,000. This compares with actual net revenues of $7,082,600 for the twelve months ended Sept. 30, 1928. In addition to the allowed return on the rate base, the settlement provides, among other things, for indeterminate permits, for the approval by the Commission Council of the city of the issue of securities and for an option to the city to purchase any or all of the three departments of the company at the current rate base valuation. These departments embrace gas, electric light, power, and railway services.

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Mr. Cabot Answers Mr. Scharff

Phillip Cabot has contributed to the *Atlantic Monthly* for November an article entitled, "Ethics and Politics—the Public and their Utilities." In some respects it is in the nature of a reply to the article by Maurice R. Scharff, which appeared in the September *Atlantic* and was digested in the ELECTRIC RAILWAY JOURNAL for Sept. 1, page 362, under the title "A Dictator Suggested."

Mr. Cabot finds that the American people are overwhelmingly opposed to government interference in business. He finds that the public is protected by regulation through state commissions from excessive prices paid to operating companies and that holding companies cannot possibly oppress customers of local companies because holding companies have no contact with them.

Mr. Cabot's chief point seems to be that commissions have erred in seeking to regulate profits of operating companies, rather than prices. He declares that "profit is the spur to private initiative; without it ambition and progress are destroyed, and, therefore, profit regulation as a method of price regulation is vicious."

The author says that the "present tendency of commissions to determine net income, or profit, and to regulate that is wholly opposed to the best interest of the consumers." He believes that by this system the investor is pampered while the consumer is neglected. Mr. Cabot says:

> It is entirely possible to regulate gross income—that is, prices—directly, and if this is skillfully done profit will be effectively and justly regulated. Today this is not done. Profits are not regulated—they are confiscated.

Baltimore Depreciation Hearing Advanced

The Maryland Public Service Commission has set Nov. 19 as the date to open the depreciation hearing in the fare case of the United Railways & Electric Company, Baltimore. Details of the survey of the company's property could not be fully completed by Nov. 15, the time originally set.

Equipment of Penn Yan Road to Be Removed

Under a Federal court permit issued by Judge Simon L. Adler of Rochester, William J. Tylee, Penn Yan, as receiver for the Penn Yan & Lake Shore Railway is now allowed to sell the assets to benefit the creditors and bondholders. This 9-mile railway ceased operation some time ago.

The rails, power line and rolling stock and the equipment in the yards have already been sold to the S. Snyder Corporation of Rochester. Work is expected to begin at once in removing the tracks from the streets of Penn Yan and along the west lake road. The line leaves the state road at Keuka Park and runs in past Keuka College.

Buses have taken the place of the old line now, with daily service furnished along the lake from Penn Yan to Hammondsport and Bath. The trolley cars are now "parked" in the power house at Keuka Park. Years ago Electric Park, near the power house, with a dance hall and other attractions, was a rendezvous for pleasure seekers. The real estate owned by the Penn Yan & Lake Shore Railway will be sold later.

New Member on Springfield Board

Bentley W. Warren, for some years counsel for the Springfield Street Railway, Springfield, Mass., was added to the board of directors of the company at the annual meeting on Nov. 8. He will continue to serve in the capacity of counsel. Mr. Warren is unusually well informed on railway economic problems.

Finis Written to Detroit United

Exchange of securities under way in new company successor under foreclosure to Michigan road

A. L. DRUM, president of the Eastern Michigan Railways, the successor to Detroit United Railways, states that the new company is now in possession of the properties and that he confidently expected that the full interest on the new adjustment mortgage bonds would be earned and paid when due on April 1 next. Eastern Michigan-Toledo Railway is a wholly owned subsidiary formed to take over the Detroit, Monroe & Toledo Short Line Railway. Properties were acquired on behalf of bondholders at recent foreclosure sale.

The reorganization committee of Detroit United Railway recently issued the following notice:

On and after Oct. 18 cash and bonds and voting trust certificates for common stock of Eastern Michigan Railways, bonds of Eastern Michigan Toledo Railroad, and fractional scrip certificates will be ready for delivery to holders of certificates of deposit entitled thereto under the provisions of the reorganization plan. Bonds and fractional scrip certificates will be delivered in bearer form.

To obtain deliveries of new securities the holders of certificates of deposit must surrender the same in negotiable form to the depositary which issued them. In all cases where voting trust certificates are desired in names other than those in which certificates of deposit were issued or are registered the cost of the required federal and state transfer tax stamps must be paid to the appropriate depositary by those surrendering such certificates of deposit.

Those desiring new securities forwarded to them must state the forwarding agency desired and remit the cost of transmission to the appropriate depositary. They must likewise state whether and at what valuation they desire such new securities to be insured and must similarly provide the cost of such insurance.

Until Nov. 17, 1928, first mortgage and collateral trust sinking fund five-year 6 per cent bonds of Detroit United Railway and first mortgage 5 per cent 30-year gold bonds of Detroit, Monroe & Toledo Short Line Railway may be deposited under the reorganization plan without penalty.

Securities of Eastern Michigan Railways will consist of first mortgage and collateral trust bonds limited to $5,000,000, of which $3,350,000 are to be issued immediately and the balance reserved for issue under various restrictions as set forth in the reorganization plan promulgated last April, and $4,915,000 of convertible adjustment mortgage bonds. Both issues bear 7 per cent interest.

First mortgage bonds of the Toledo company will total $2,000,000 and bear 7 per cent interest.

Common stock of the parent company will be issued in the amount of 200,000 shares. An additional authorized 200,000 shares will be reserved for conversion of adjustment mortgage bonds. The subsidiary company's stock will consist of 50,000 shares. The parent company will not assume liability for the payment of interest or principal of the subsidiary company's bonds.

Ohio Interurban Set for Suspension

Abandonment of the Southern Ohio Public Service Company's interurban line between Columbus and Zanesville was authorized on Nov. 13 by the Ohio Public Utilities Commission. Service between Columbus and Newark will be discontinued after Jan. 15, and from Newark to Zanesville later.

The company contended that it lost $80,644 in the year ended Sept. 30, and that it was not financially able to meet the cost of street improvements in the cities it serves. Such contemplated improvements would cost the company an aggregate of $600,000, the company contended.

The late date for the abandonment of the Zanesville-Newark section was set so that application for bus service in the region may be acted upon before interurban service stops.

Fort Wayne Stock Offered

Authority to issue and sell 85,000 shares of its common stock without par value to yield $850,000 was asked in a petition filed with the Public Service Commission on Nov. 10 by the Indiana Service Corporation, Fort Wayne, Ind. The petition recites that the proceeds will be used for capital expenditure already made or planned to the company's interurban and local electric railways and electric light and power facilities.

The company during the year has made extensive improvements in its railway properties, including several miles of track extensions in the city of Fort Wayne, and has built additional mileage in electric transmission lines. The Indiana Service Corporation is a subsidiary of the Midland Utilities Company, Chicago.

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Dividend Payment by Brooklyn City Railroad

The Brooklyn City Railroad, Brooklyn, N. Y., has declared a dividend of 10 cents a share on the capital stock of $10 par value. This is the first payment on the issue since March 1, 1927, when a distribution of the same amount was made. The dividend is made payable on Dec. 15 to holders of record of Dec. 1.

Twin City Net Lower—President Sees Earnings at Ebb

The Twin City Rapid Transit Company and subsidiaries, Minneapolis, Minn., report for the quarter ended on Sept. 30, a net loss of $17,867 after taxes and fixed charges. This contrasts with net income of $149,111 in the preceding quarter, equivalent after allowing for preferred dividend requirements to 44 cents a share on 222,000 shares of common stock, and with a net income of $93,663 or 18 cents a common share in the third quarter of 1927. Net income for the first nine months of 1928 was $555,804, equal after preferred dividends to $1.81 a common share, against $838,058 or $3.09 a share in the first nine months of the preceding year.

Horace Lowry, president of the Twin City Transit, in a recent letter to a Canadian shareholder, says that he personally is optimistic as to the future and expresses the hope that Canadian shareholders of the company will not be tempted to sell their stock at the present low price.

The Canadian *Financial Post* says that President Lowry apparently bases his hopes for improvement on the fact that, while the number of street-car riders has been decreasing from year to year, the year 1928 so far has shown smaller decrease than has been the case in any year since 1920.

Explanation for the interest of the Canadian financial paper in the Twin Cities case is to be found in the fact that the company has a large financial following in the markets of Toronto and Montreal.

Elsewhere in this issue is an item referring to the fare situation in the Twin Cities that includes a statement in which President Lowry reviews the past in them and the probable prospects for the future.

Income from Dividends in Washington Taxable

The dividends received by the Washington Railway & Electric Company, Washington, D. C., from the stock of the Potomac Electric Power Company, which it owns, form a part of its "gross receipts" and are taxable under the law at 4 per cent, according to an opinion of the District Court of Appeals rendered by Justice Charles H. Robb. Interest and dividends from investments and rent from lands, buildings and equipment received by the Potomac Electric Power Company are also held to be taxable as part of "gross earnings" after allowance for cost of raw materials and the like.

The decision means that the railway company will be called upon to pay $151,200 to the District tax collector, representing 4 per cent on the dividends paid by the power company since the case was taken to court in 1925.

The total of dividends paid since the case went to court to date is $3,780,000. Of this $840,000 was paid in 1925, $960,000 in 1926, $1,080,000 in 1927 and $900,000 thus far in 1928. The dividend rates in the various years were as follows: 1925, 14 per cent; 1926, 16 per cent; 1927, 18 per cent, and 1928, 20 per cent.

The railway owns $6,000,000, or the entire issue of common stock in the power company. In addition to this stock issue there is outstanding $5,000,000 of 5½ per cent preferred stock and $2,000,000 of 6 per cent preferred stock not owned by the railway and therefore not affected by this decision.

The commissioners included the power company items in the assessment, but the companies disputed the matter and brought suit in the District Supreme Court for an injunction to prevent the collection of the taxes. The lower court upheld the action of the commissioners and the companies appealed.

Earnings Increase in Indianapolis

Net earnings of the Indianapolis Street Railway, Indianapolis, Ind., showed an increase in October of $9,572, according to a report filed with the Indiana Public Service Commission. Earnings were $114,209, against $104,637 for the similar month of 1927. Net earnings for the first nine months of the present year are $107,016 more than for the corresponding period of 1927.

Personal Items

Messrs. Blair and Egolf in the News

Col. Edward J. Blair, general manager of the Chicago, Aurora & Elgin Railroad, Aurora, Ill., has been summoned to Chicago by the surface and the elevated lines to assist in working out a solution of the railway problem in that city. John F. Egolf, vice-president of the Western United Gas & Electric Company and former general manager of the Chicago North Shore & Milwaukee Railroad, succeeds Colonel Blair as general manager of the "Aurora and Elgin." The order transferring Colonel Blair and appointing his successor became effective Nov. 1.

Prior to his appointment as general manager of the Chicago, Aurora & Elgin three years ago, he had been connected with the Chicago Rapid Transit Lines for twenty years. Following his graduation from Cornell University, he went to work in the shops of the Chicago elevated lines. His ability was soon recognized, resulting in rapid promotion from one position to another. When the country entered the World War in 1917, Colonel Blair, who at that time was chief electrical engineer for the elevated system, volunteered his service and received a commission in the 311th Engineers. He quickly rose to captain and major and his regiment was ordered overseas, where it was an important unit in the construction of railroads in France. On his retirement from the Army with the rank of colonel, he returned to the Chicago Rapid Transit Lines and was made assistant to Britton I. Budd, president of the elevated system and of other electric railways entering Chicago. In that capacity he had an opportunity to acquire intimate knowledge of the transportation problems in the Chicago metropolitan area, not only of the operations, but also of the financial plans of the railroad.

As negotiations are now under way between the transportation companies and the city of Chicago with a view to effecting a merger of surface, elevated and bus lines and the building of a downtown subway, the wide experience of Colonel Blair makes his services indispensable to the company committees engaged in this work.

Mr. Egolf, who succeeds Colonel Blair, is well known in electric railway operations in metropolitan Chicago. For several years he was manager of the Aurora, Elgin & Fox River Electric Railway, leaving that position for a time to become general manager of the North Shore Line. He resigned that position last year to return to Aurora as vice-president of the Western United Company. Mr. Egolf will remain in his present position with the gas and electric utility in addition to the active operation and management of the Chicago, Aurora & Elgin.

Changes in Stone & Webster, Inc., Organization

Walter H. Burke has resigned as district manager of the companies under the executive management of Stone & Webster, Inc., in the Southwestern district, and is returning to the East.

Effective Jan. 1, 1928, James F. McLaughlin has been appointed to succeed Mr. Burke as district manager of the companies in the Southwestern district comprising the properties located in Texas, Louisiana, New Mexico and Mexico.

Tom P. Walker, vice-president of Virginia Electric & Power Company, is to be transferred from Norfolk to Richmond and, effective Dec. 1, 1928, will

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be in general charge of all operations of the company, succeeding Mr. McLaughlin.

Joseph Bowes, formerly manager of the El Paso Electric Company, El Paso, Tex., has been transferred to the Virginia Electric & Power Company and will assume charge of the Norfolk division of that company, effective Dec. 1, 1928.

Francis J. Gannon, formerly assistant treasurer and secretary of Davis Islands, Inc., Davis Islands, Tampa, Fla., and previous to that assistant treasurer for varying periods of time of various of the companies under the executive management of Stone & Webster, Inc., has been appointed, effective Nov. 15, 1928, manager of El Paso Electric Company (Texas corporation), El Paso & Juarez Traction Company, Rio Grande Valley Traction Company and Mesilla Valley Electric Company.

J. F. Gilchrist Formally Resigns

John F. Gilchrist, chairman of the New York Transit Commission, tendered his resignation to Governor Smith, effective Nov. 15. Mr. Gilchrist resigns in order to accept an attractive business offer. The Governor has accepted Mr. Gilchrist's resignation. The latter's activities in the regulatory field and his new business connection were mentioned in ELECTRIC RAILWAY JOURNAL, issue of Oct. 13, 1928.

New Division Manager of Northern States

Glen V. Rork has been appointed manager of the Wisconsin division of the Northern States Power Company, with headquarters at Eau Clair, Wis. For a number of years after his graduation from college at Ripon, Wis., in 1910, he was employed in various branches of electrical work for one of the operating subsidiaries of the Northern Pacific Railroad.

Mr. Rork entered the employ of the Wisconsin-Minnesota Light & Power Company, now the Wisconsin division of Northern States Power Company, in 1920. Following the purchase of the Midland Public Service Company, with headquarters at Owen, Wis., by the Northern States Power Company, Mr. Rork developed that company's system from a five-town unit to its present size of 23 towns.

Mr. Rork, whose appointment was announced by R. F. Pack, vice-president and general manager, was born at Reedsburg, Wis.

Since the resignation of George H. Wilmarth as manager of the Wisconsin division of Northern States Power Company, to become chief operating engineer of the company, with offices in Minneapolis, Harold L. Geisse, vice-president and general manager of Wisconsin Valley Electric Company, has supervised operations of the Wisconsin division.

W. L. Haymond Promoted by Brill

Wirt L. Haymond, assistant sales manager of the American Car Company, St. Louis, since 1918, was appointed sales manager, effective Oct. 1. In this position he succeeds F. A. Richards, whose resignation to become president of the Metropolitan Railway Equipment Company, St. Louis, was announced in the ELECTRIC RAILWAY JOURNAL issue of Oct. 20.

Mr. Haymond has grown up in the Brill organization. Starting in December, 1897, when only sixteen years of age, his early activities were devoted to the accounting division of the Brill plant in Philadelphia. In 1902 he was transferred to the American plant and placed in charge of the time and cost departments. From 1908 until 1918, when he became assistant sales manager, he acted as chief clerk to the general manager.

W. L. Haymond

By training and experience Mr. Haymond is well fitted to "head up" the sales organization of the American Car Company. His close association with the sales activities of the company for so many years assures the industry the same careful consideration which its equipment problems have always received in the past. He is a member of various local activities in St. Louis, including the Missouri Athletic Association, Westborough Country Club, the Chamber of Commerce, the Traffic and the Birney Clubs.

Promotions on West Penn System

William R. Hinchman, formerly assistant treasurer and assistant secretary of the American Water Works & Electric Company, Inc., has been elected treasurer of the West Penn Electric Company and will be permanently located in Pittsburgh. Mr. Hinchman has been connected with the "American" system for seven years, having started in the New York office in May, 1921. He worked during different periods at the Chattanooga, Little Rock, and South Pittsburgh plants where he conducted efficiency tests, and subsequently joined the treasury department in New York. In February, 1926, he was made assistant treasurer and assistant secretary.

D. P. Guest has been promoted from senior assistant treasurer of the West Penn Power Company and West Penn Railways to treasurer of both companies. He will continue as assistant treasurer of the West Penn Electric Company. Mr. Guest became associated with the West Penn Oct. 10, 1927.

LUKE C. BRADLEY of the Electric Bond & Share Company plans to spend about three months abroad soon, principally in South American countries, in an inspection of the utility properties of the American & Foreign Power Corporation, which is under Electric Bond & Share auspices. The properties controlled include electric railway, electric light and power plants, waterworks and telephone installations.

W. A. BUTTRICK, president of the Twin State Gas & Electric Company, Boston, Mass., has been elected chairman of the New England Bureau of Public Service Information. D. D. BARNUM, president of the Boston Consolidated Gas Company, is vice-chairman, and JOSEPH B. GROCE, of the Edison Electric Illuminating Company of Boston, is treasurer.

OBITUARY

MURRY A. VERNER, 76 years old, formerly prominent in the political and business life of Pittsburgh, and interested at one time in a number of electric railways, many of which he financed in the early days of the application of electricity as motive power to city and suburban lines, died on Nov. 3. He was born on the site now occupied by the Fort Pitt Hotel in Pittsburgh.

FRANK WALTER STEVENS, consulting valuation counsel for the New York Central Lines, died in Covina, Cal., on Nov. 8. In 1907 he was appointed chairman of the Public Service Commission of the Second District of New York, serving until 1913 when he became valuation counsel for the New York Central lines. He continued in this capacity until 1924, when he was appointed consulting valuation counsel. In addition to these activities he was known for his work "The Beginnings of the New York Central Railroad," covering the history of the steam railroads traversing the territory of the Hudson River, Buffalo, and the Niagara River. These roads were consolidated in 1853 into the New York Central Lines. Mr. Stevens was born in Leon, N. Y., 81 years ago. He was graduated from the Harvard Law School and later began practice in Jamestown, where he served as local attorney for the New York Central.

W. H. MAY, vice-president of the Shuler Axle Company, died on Oct. 30. Mr. May was 80 years of age and had been an executive of the Shuler company for the past eight years. He had been prominent in business circles of Louisville and was formerly president of the National Casket Company.

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More Large Orders for Heavy Equipment to Be Made

$20,000,000 electrification authorized by Reading Railroad. Bids for 100 coaches to be asked immediately. Equipment market continues good

EXPENDITURE of $20,000,000 for electrification of most of the Reading Railroad within the Philadelphia metropolitan district has been authorized by the directors, according to announcement made by Andrew T. Dice, president of the company.

It is expected that bids on the preliminary work of the electrification, as well as the construction of 100 cars, will be asked within the next two or three weeks. The road distance of the branches to be converted is 49.9 miles, and will include 110 miles of actual track to be electrified.

It is indicated that the program includes the electrification of all four main tracks between Reading Terminal and Wayne Junction, and the two tracks from Wayne Junction to Lansdale from Langhorne and Chestnut Hill. Service on these lines will be increased about 25 per cent and the speed of travel increased from 20 to 24 per cent.

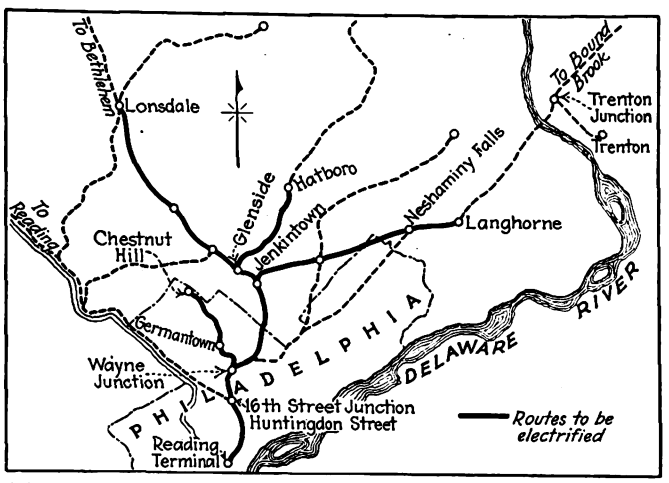
Overhead Single-Phase System

Like the Pennsylvania electrification, it is planned in this project to use single-phase alternating current at 11,000 volts. Overhead trolley wires will be installed and pantographs will be used on both cars and locomotives. The lines will be supported by steel bridges at intervals of about every 300 ft.

Active progress is now being made on the detailed plans required. Erection of the catenary overhead will be the first physical work undertaken, and it is planned to begin construction at outlying points. The work will then proceed toward the more congested part of the railroad system. A number of substations will be built at various points for the most effective and reliable distribution of power to all parts of the system.

The coaches are to be of the multiple-unit type, and will release 35 steam locomotives in use, and also 120 coaches will be diverted to service in other points on the system. The new arrangement will provide express service to the outlying territory throughout the day instead of providing only local service at certain times, as at present.

At Wayne Junction, a large car storage yard and electrical repair shop will be erected on the ground between Chestnut Hill and Tavor branches, and immediately north of Wayne Junction station. The railway has already purchased ground at this location. Coincident with the electrification, the railway will install color light signals in the entire territory, replacing the present semaphore signals.



Electrification of Reading Railroad has been authorized in the Philadelphia metropolitan area at a cost of $20,000,000

This program, to be completed in three years, is a start toward the eventual electrification of virtually the entire system, including the New York division. According to Mr. Dice, the installation of electric trains on the Schuylkill Valley branch to Reading and Pottsville might be expected to follow the completion of the present undertaking; it was felt unlikely, however, that any definite announcement about electrification of this branch or the New York division would be made before completion of the first routes.

Reading's Forward Step

ANNOUNCEMENT by the Reading company of its program for the electrification of all its lines within the metropolitan district of Philadelphia marks another forward step in the progress of modern transportation that will be of great benefit to the entire community. Upon its completion this work will result in an increase of the Reading's suburban train service, a marked shortening of time for commuters, and, of course, in a material reduction in the smoke and dust menace. Philadelphians will not overlook the significance of the fact that this program involves the substitution of electric for steam power on all the main lines of the company.

The Reading company, by this decision, puts itself in the van in a movement in the transportation world that is bound to cover the entire country. With the electrification of the entire suburban service of the Reading and Pennsylvania systems, this city will possess transportation facilities unsurpassed anywhere—*Philadelphia Ledger.*

Track Purchases

Track purchases through the past month have been fairly large. Pittsburgh Railways, Pittsburgh, Pa., has placed orders for 10,000 6 in. x 8 in. x 8 ft. ties, 10,000 tie plates, 20 pairs of switch points, 20 kegs of tierod washers, six switch stands, one car of molding sand, 5,000 tierods, three cars of ½-in. Ligonier screenings, and 40 kegs of track bolts of various sizes.

Arkansas Power & Light Company, Little Rock, Ark., has placed orders for one double-track electric over steam road crossing, and one single-track electric over steam road crossing. This company has also ordered material consisting of frogs, switches, mates, and curved rail for seven jobs in Little Rock, Ark., at an approximate cost of $6,000.

Lehigh Valley Transit Company, Allentown, Pa., has ordered one standard model 38-B Barber-Greene snow loader. The St. Louis Public Service Company, St. Louis, Mo., has installed double tracks in conjunction with the widening and repaving of Franklin Avenue between Third and High Streets.

Line Materials Ordered

Considerable line material has been ordered recently, according to reports received from several railways. The Lehigh Valley Transit Company, Allentown, Pa., has placed orders for three miles of 00 grooved copper trolley wire, 10,280 ft. of ¼-in. galvanized steel strand wire, and 5,000 ft. of ⅜-in. galvanized steel strand wire. Arkansas Power & Light Company has ordered 6,000 lb. of trolley wire, 600 lb. of 0000 clinch ears, 50 lb. of 0000 hangers and three 20-in. frogs.

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Pittsburgh Railways, Pittsburgh, Pa., has ordered 200 72-in. 0000 type CAE bonds, 500 46-in. CAE type bonds, and 500 40-in. CAE bonds. This company has also ordered 5,000 15-in. 00 champion line ears, 25,000 ft. ¼-in. dead soft-annealed galvanized wire, six electric track switches with type T-3 ground boxes, and electric circuit changers, and has let a contract for the purchase of four blocks track circuit type APB signals, and one block track circuit facing signals between Boggs Passing Siding, and South Bank Stop. Another contract has been let for the purchase of ten tracks circuit type spacing signals for use on the interurban system.

Ten sets of door and step engines have been ordered by the Lehigh Valley Transit Company. Other car equipment and supplies ordered by this company include fifty 34-in. forged steel wheels, 2,000 variable size brake pins, and sixteen sets of armature coils. The Arkansas Power & Light Company has ordered four 16-passenger city type buses at an approximate cost of $18,000.

The Pittsburgh Railways has remodeled seven 4300 type low floor center entrance cars for one-man operation. This company has also just received the last of its order of fifteen interurban cars.

The Pittsburgh Railways has also let a contract for the purchase of a high-tension oil circuit breaker and structure with one spare breaker unit for its Broad Street substation. Shop equipment ordered by the Lehigh Valley Transit Company includes three frame unit heaters and three air vents.

In Canada, the London & Port Stanley Railway, London, Ontario, has been authorized to build an additional track across Bridge Street, to rearrange yard tracks, and to build a connecting track crossing Bessie Street, Port Stanley, Ontario.

The Regina Municipal Railway, Regina, Saskatchewan, is considering the extension of its car service from the northwest section of the city to the heart of the industrial area, which will involve a track installation costing about $75,000.

British Columbia Electric Railway, Vancouver, B. C., has let a contract for a cable subway in the vicinity of Point Grev substation at an approximate cost of $9,000. Calgary Municipal Railway, Calgary, Alberta, has ordered two cars and a snow sweeper.

ELECTRIC RAILWAY MATERIAL PRICES—NOV. 13, 1928

Metals—New York

Copper, electrolytic, cents per lb	15.775
Lead, cents per lb	6.35
Nickel, cents per lb., ingot	35.00
Zinc, cents per lb	6.60
Tin, Straits, cents per lb	50.00
Aluminum, 98 or 99 per cent, cents per lb	23.90
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	53.00
General service	31.50

Bituminous Coal

Smokeless Mine Run, f.o.b. vessel, Hampton Roads, gross tons	4.375
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1 8
Franklin, Ill., screenings, Chicago	1.35
Central, Ill., screenings, Chicago	1 00
Kansas screenings, Kansas City	1.625

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, ⅝ in. and larger, cents per lb	2.80
Tie plates (flat type), cents per lb	2.15
Angle bars, cents per lb	2.75
Rail bolts and nuts, cents per lb	3.90
Steel bars, cents per lb	1.95
Ties, white oak, Chicago, 6 in.x8 in.x8 ft	$1.40

Hardware—Pittsburgh

Wire nails, base per keg	2.55
Sheet iron (24 gage), cents per lb	2.75
Sheet iron, galvanized (24 gage), cents per lb.	3.55
Galvanized barbed wire, cents per lb	3.20
Galvanized wire, ordinary, cents per lb	3.00

Waste—New York

Waste, wool, cents per lb	18.
Waste, cotton (100 lb. bale), cents per lb.:	
White	17.25
Colored	13.5

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb	10.3
White lead in oil (100 lb. keg), cents per lb.	13.25
Turpentine (bbl. lots), per gal	$0.65
Putty, 100 lb. tins, cents per lb	5.725

Wire—New York

Copper wire, cents per lb	17.875
Rubber-covered wire, No. 14, per 1,000 ft.	5.3
Weatherproof wire base, cents per lb	17.125

Paving Materials

Paving stone, granite, 5 in., f.o.b. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd., f.o.b.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd., delivered	3.375
Cement, Chicago consumers' net prices, without bags, f.o.b.	2.05
Gravel, ¾-in., cu.yd., delivered	3.375
Sand, cu.yd., delivered	2.125

Old Metals—New York and Chicago

Heavy copper, cents per lb	13.375
Light copper, cents per lb	11.625
Heavy yellow brass, cents per lb	7.875
Zinc, old scrap, cents per lb	3.25
Lead, cents per lb. (heavy)	5.125
Steel car axles, Chicago, net ton	$15.75
Cast iron car wheels, Chicago, gross ton	14.375
Rails (short), Chicago, gross ton	17.50
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	7.75

120 Buses Bought for Service in Detroit

The Detroit Municipal Railway, Detroit, Mich., has contracted to buy 120 buses. Ninety will be 16-passenger Graham-Dodge coaches at $4,535 per unit. Deliveries are to be made at rate of four a day. The city will pay 20 cents a mile for each coach for the first 120 days and thereafter 11½ cents a mile until the purchase price has been paid.

Fifteen will be 40-passenger single-deck metropolitan type made by the American Car & Foundry Company costing $10,962 each, to be delivered at once and paid for on time, and fifteen are 40-passenger buses of the Twin Coach Company costing $12,550 each, to be bought under the same arrangement and to arrive by Dec. 1.

Representatives have been sent to Chicago to study a 10-passenger bus, 50 of which may possibly be purchased.

North Shore Receives Three New Cars

The Chicago North Shore & Milwaukee Railroad, Chicago, Ill., has recently received and placed in regular service between Chicago and Milwaukee two additional dining cars and one parlor observation car built by the Pullman Car & Manufacturing Corporation.

Delivery of this new equipment brings the total of new all-steel cars placed in service by the North Shore Line this year to eighteen. Fifteen passenger motor cars incorporating many advanced features for passenger comfort and safety, including plush-covered bucket type seats were delivered by the same manufacturer during the spring and summer.

The three cars just placed in service are modishly designed. The diners, seating 24 persons each, are finished in buff paint with walnut panels and have ornamental sidelights. The parlor-observation car has seventeen revolving easy-chairs, upholstered in light blue frieze plush. The walls are finished entirely in walnut. On the floors of both the parlor car and the diners is black and gold carpeting, with felt padding underneath. The observation platform in the rear is entirely enclosed with glass.

Including these latest cars the North Shore Line this year has added new freight and passenger equipment costing over $900,000. Other rolling stock includes ten light-weight double-truck Safety cars for Milwaukee and Waukegan city service, two new electric freight locomotives, fifteen additional steel semi-trailers for handling door-to-door merchandise despatch shipments and three 5-ton tractors for hauling trailers to and from freight receiving stations.

Detroit Car Award Stands

Circuit Court Judge Gilbert has dismissed the suit to secure a permanent injunction restraining the city of Detroit from carrying out a contract to buy 100 street cars from the Perley A. Thomas Company, High Point, N. C. A temporary restraining order was dissolved.

ADVERTISING LITERATURE

Anaconda Copper Mining Company, through its subsidiary, the American Brass Company, Waterbury, Conn., is rebuilding its electrical cable plant at Hastings-on-Hudson, New York, N. Y. This plant will be constructed to produce quality power cable of all types. A testing laboratory for advanced high-tension cable work and for the examination of insulating oils, paper and cable sheath is being provided. The Hastings plant, was originally operated by the National Conduit Cable Company.

Money-Meters, Inc., Detroit, Mich., has published a booklet on modern fare collection describing the use and advantages of Money-Meters products.

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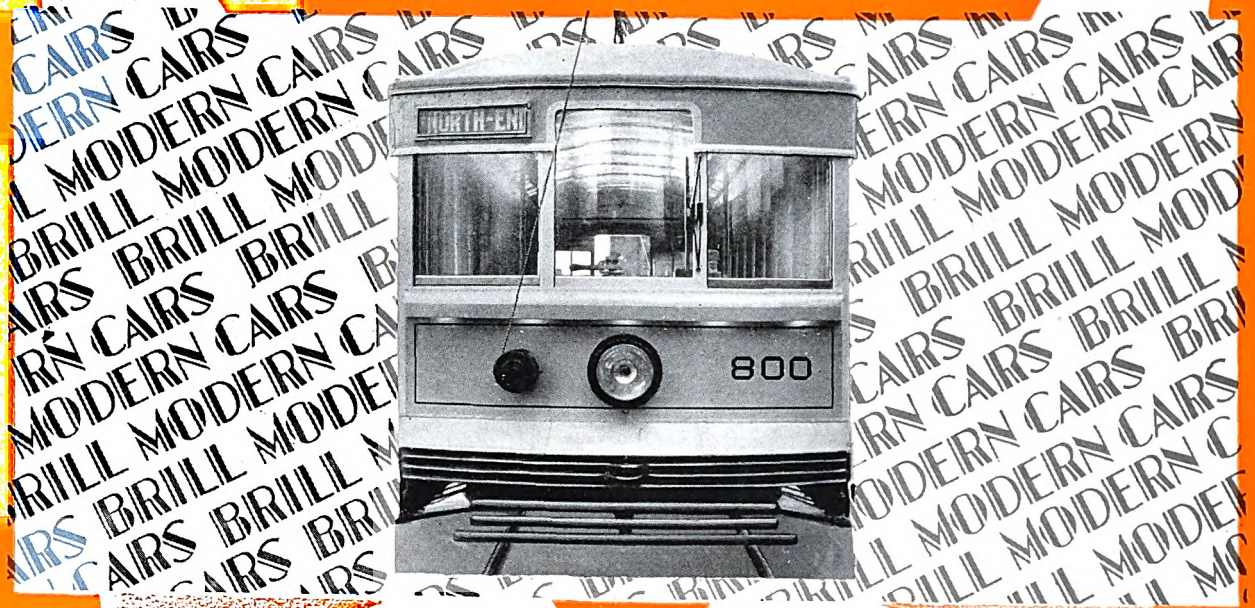

Create Community Pride

Successful railways are learning how to win confidence and create community pride. Probably the first step in attaining this goal is to examine existing rolling stock from the rider's point of view. Is the external appearance inviting? Do the comfort qualities equal those of the rider's automobile? Further, is the desire for speed satisfied?

The Fairmont Car, we believe, is an example of Brill engineering and workmanship that fulfills these conditions remarkably well. From a standpoint of appearance and comfort, this car leaves nothing to be desired. The reduced weight of the car together with the W-N drive which permits the use of light-weight, high-speed motors are aids to more rapid acceleration.

Modernization with this type of equipment wins the confidence and support of financial interests. It does more. It creates community pride which is so essential to increased patronage.

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PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

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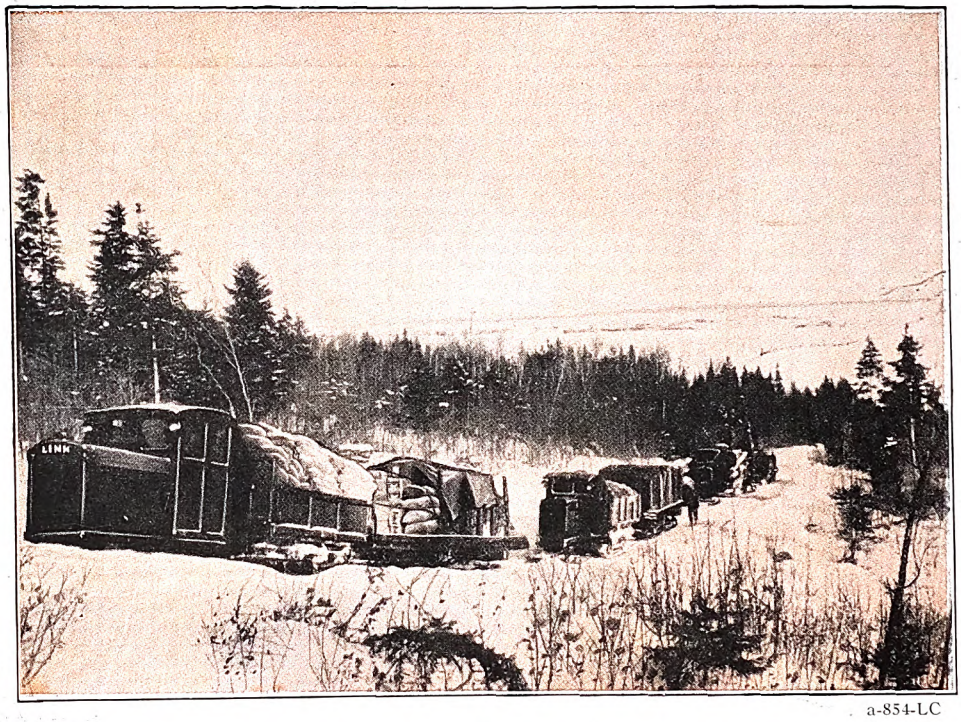

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Waukesha equipped Linn Snow Tractors conquer the Arctic Winter

Waukeshas replace Huskies

That Pullmans may go to Hudson Bay in 1929—tractor snow trains now push beyond the arctic circle. Arthur H. Chute in a recent Saturday Evening Post story vividly describes the thrill of seeing these Waukesha powered trains starting out on their trek across Hudson Bay and through trackless wilderness where temperatures of 50 below zero are often encountered. He said,

"A thrilling event during my stay at Nelson (on Hudson Bay) was the departure of four tractors, each loaded with four sleighs, carrying altogether some 200 tons bound for Churchill, 160 miles distant. Without a tote road, these 125 H. P. tractors have proved a revelation in winter transport in the north. Heretofore only dog teams had ever attempted this journey." This is always the impression Waukesha engines give users or observers who are not familiar with their wonderful power and unfailing reliability.

"L-Head Engines—They take better care of themselves."

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ELECTRIC RAILWAY JOURNAL

cGraw-Hill Publishing Company, Inc. NOVEMBER 24, 1928 Twenty Cents Per Copy

SUMMING UP SAVINGS IN BUS PARTS

STEERING PIVOTS	TIMKEN-EQUIPPED
DIFFERENTIALS	TIMKEN-EQUIPPED
TRANSMISSIONS	TIMKEN-EQUIPPED
WHEELS	TIMKEN-EQUIPPED
PINIONS	TIMKEN-EQUIPPED
AT EVERY HARD SERVICE POINT	TIMKEN-EQUIPPED

TIMKEN *Tapered Roller* BEARINGS

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

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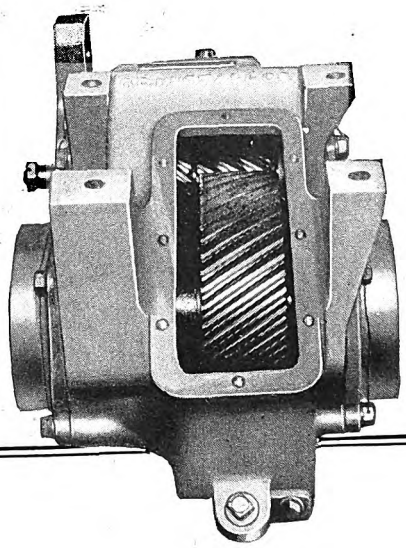
The W-N Drive and what it means to the Industry



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Electric Railway Journal

Consolidation of
Street Railway Journal and Electric Railway Review

McGRAW-HILL PUBLISHING COMPANY, INC.
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H. C. PARMELEE, *Editorial Director*

CHARLES GORDON, *Editor*

LOUIS F. STOLL, *Publishing Director*

Volume 72 New York, Saturday, November 24, 1928 *Number 21*

Decision in New York Fare Case Again Postponed

ACTION this week by the United States Supreme Court in the New York City fare case has received various interpretations. Some advocates of the 5-cent fare profess to see in the order for a reargument an indication that the court inclines to their view. On the other hand, believers in a higher fare point out that the order shows only that the court is prepared to hear arguments. This means, they conclude, that the court considers the case within its jurisdiction.

The authority of the federal courts to intervene in such essentially local matters as franchises and rates of fare of intrastate railways comes from the 14th Amendment to the Constitution which forbids any state to deprive "any person of life, liberty or property without due process of law." Utility rates come under this clause because, as the property of a utility is devoted to public use, its rates may be regulated by the state. If they are regulated by the state, it is violating the federal constitution if it imposes a confiscatory rate or if it refuses to relieve a company from a confiscatory rate.

Not all utility franchises, of course, are awarded by the state—at least not wholly by the state. The city in which the utility is located often is a party to the franchise grant. Where this occurs, the city may have the power to act independently of the state in awarding the franchise, it may do so simply as an agent of the state, or it may act jointly with the state. If there is nothing in the state constitution or in its basic law to prevent it doing so, a state may authorize a city to be the sole grantor and empower it to award a franchise which in essence would be a contract. There are decisions which indicate that the Federal Supreme Court will not intervene in such a case to overturn the contract, no matter how improvident to one side or the other it may have been. But its decisions also indicate that not only must any such surrender be very clear and unmistakable but that it must also be definitely shown that the state had the power at the time to delegate such authority. This takes the question back again to the wording of the State Constitution, as well as to its basic laws.

From this it will be seen that a federal decision in one city on utility rates may not necessarily control in another, or even that two decisions in the same city may not be identical, if the franchises were awarded at different times.

It is the contention of the Interborough Rapid Transit Company, of course, that New York State never delegated to New York City so much of the state power over utility rates as to prevent the state from raising such rates if they became confiscatory but that they were subject to the public service commission law and hence subject to the state's regulatory power over rates. It is also the contention of the Interborough that its applications to the state commission for rate increases have been disregarded, so that its only recourse for relief had to be to the federal courts.

From its recent action it appears that the United States Supreme Court is willing to consider this case on its merits, but nothing thus far disclosed gives any real clue as to what its final decision will be.

Four Years of Unification at Akron

FOUR years ago the city of Akron Ohio, was just beginning to recover from the effects of a controversy in which all railway service was withdrawn. The local company's franchise had expired and the city and the management were unable to reach a settlement over terms that involved a readjustment of fares. It was a story long drawn out, but fully reviewed in the JOURNAL at the time. Out of the controversy grew a settlement which provided for operation by the Northern Ohio Power & Light Company over a period during which strict account was to be kept of income and outgo so that the basis might be reached for the negotiation of a new contract. That period has now expired, but service will be continued under the terms of the temporary grant until negotiations can be concluded, based on the results of the study of the last four years.

Since the temporary grant was arranged in Akron the transit situation there has undergone changes probably greater than those of any other city, certainly any other city comparable with it in size. Car and bus lines now form a complete network in and about Akron, so that the company has become the largest bus operator in Ohio and one of the largest operators in the United States. In every way possible the company has developed bus transportation. It has done this not only in its own interest but in the interest of all Akron as well, since that is what Akron apparently desired. That which has been accomplished is the result of united effort. The people of Akron aided materially, first by gladly voting for a progressive franchise, and, second, by the application of a proper supporting spirit.

Traffic conditions in Akron are becoming worse as the years go by. Demands are certain to become heavier on the city's transportation system. A committee of citizens—men who desire to see advancement—undertook several months ago to investigate the company's transportation system thoroughly and to study the city's future needs and requirements. This report is said to be nearly ready. Officials of the company pledge their continued co-operation.

Out of Akron ought to come a tale of experience of benefit to the entire industry. Certainly if nothing is permitted to mar the spirit of friendly co-operation which has been so much in evidence the last four years, a new operating contract ought to result with terms based on a period of experience under new conditions and leaving very little chance for controversy in the future.

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Co-ordination Gaining Favor Abroad

WHEN the Board of Estimate in New York City was debating recently the relative merits of competitive vs. co-ordinated bus operation in connection with the Equitable proposals, there may have been those who thought the problem a purely local one. Actually the same question is alive in many other cities both here and abroad. For example, there is the situation in Havana, which was discussed in detail in the Oct. 27 issue of the JOURNAL. This seems to have a counterpart in Buenos Aires. According to a paper presented at the local branch of the Institute of Transport in that city on June 21, 1928, it appears that serious evils have followed unregulated competition in the Argentine capital, where for many years the subways and street cars had a monopoly of public carrier transport. Instead of advantage being taken of the possibilities of the bus for special service, independent buses have been allowed to confine their operation almost entirely to the more congested city districts, where patronage was greatest but where the existing facilities were adequate to care for the business offered. The result has been too much service in some parts of the city and not enough in others, unsatisfactory returns for all carriers, and a demand from traffic experts for the consolidation of all lines into one company.

In European cities the unified system is becoming more and more usual. Just this past week dispatches from Berlin told of final accomplishment of the long-pending consolidation of rapid transit, surface car and bus lines. Reports from London are to the effect that negotiations are progressing favorably for the operation of the municipal tramways by the present bus and rapid transit combine. In Paris the buses and surface cars have been under one management from the beginning. Thus it goes. On every hand co-ordination is being found to be the best policy.

Charter Bus Service a Means of Learning Passengers' Desires

EXECUTIVES of electric railways who have encouraged the use of buses in charter service, even if they have gained nothing else from the venture, at least are in an excellent position to study the requirements of their regular patrons from a point of view otherwise denied to them. What the well-intentioned patron wants in the way of car service can be learned from the demands of a group of passengers seeking chartered bus service. The best viewpoints can be obtained when the company has several different types of buses which it is prepared to charter at various rates.

The agent in direct charge of charter service is in an excellent position to study passenger psychology and estimate its bearing on general passenger requirements. To him come people of a class who obviously are seeking something which, while not expected to possess the individuality of the private automobile, is superior to the regularly scheduled car or bus. What they seek may be termed de luxe mass transportation. If the chartered bus fulfills their requirements, it is interesting to determine which points of superiority commend it. If a choice is made among several types of equipment, the reasons for that choice are of great value. Is economy or comfort a deciding factor? Is the passenger willing to pay more for mere appearance, other things being equal? Is expense really much of an object if the passengers get what they want? Is speed the most important factor or is safety the first requisite? Is there a preference for any type of seat, any type of finish of interior, and so on? For instance, if there is a general preference for the bucket type of seat and for leather or plush upholstery, it is quite evident that the stiff-backed, rattan-upholstered seats or the wood slat seats such as are used in many street cars are not highly regarded by the patrons. If complaints are made after the trip that the passengers were cramped in their seats or that the buses are poorly sprung or are poorly ventilated, such information is of value and can be turned to good account the next time an order is placed for rolling stock. It may even lead to modifications of the present equipment.

While there will always be a difference in attractiveness and comfort between a mass transportation vehicle and a de luxe one, a study of passenger preference will make it possible to eliminate many features considered objectionable by the patrons and incorporate others considered desirable, when it can be done at a cost commensurate with the service the vehicle is to render. In obtaining such opinion there is no means more direct or more satisfactory than to heed the demands of the users of chartered service.

Faster and Faster

SECONDS, not so long ago, were considered almost negligible units of time. Even minutes held no great interest for a comparatively slow-moving age. The people were not accustomed to rapid means of transportation and did not think of their trips to town or to work in terms of so many minutes and so many seconds. However, the "Good Old Days" are now past history and a new demand has been created—a demand for speed. How usual it is to hear someone say: "It takes me two minutes to reach the subway station, about a half minute to catch a train, from eighteen to nineteen minutes to reach Utopia Avenue and another nine minutes to reach the office by taking a crosstown trolley." Just as the public now measures its traveling time in minutes and fractions of minutes, so must the transportation man measure his service in smaller units of time.

Countless suggestions for increasing the speed of cars have been made. Many of these have been impracticable or have involved elaborate programs costing enormous sums. Perhaps the most helpful recent outline of ways and means of increasing speed is that prepared by the service betterment committee of the T. & T. Association. Although the suggestions are fundamental and not intended to be applicable to all properties, they cover almost every possible time saver and hold many practical suggestions for any company. Increasing the proportion of time during which cars move at maximum free running speed by reducing the number of passenger stops, locating the others scientifically and regulating traffic properly are ways of shortening running time. Another is to reduce the duration of stops by using the most efficient method of fare collection and designing the cars to aid passenger flow. Better equipped cars, a properly designed track layout, a reliable power system and sufficient emergency and wrecking facilities also are necessary elements. The final and probably most important suggestion of the group is to train car operators to use to the full every opportunity for saving time. A summary of these suggestions appears elsewhere in this issue.

Faster and faster is the urge of the present day. Electric railway managements notice it on all sides and

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realize that unless speed can be obtained that is comparable with the speed of other modes of travel available today, difficulty will be experienced in retaining their present patrons. For this reason they will undoubtedly welcome the excellent report prepared by the committee on service betterment and will study it carefully with the aim of putting the ideas into practice on their own systems. Delays can be lessened and the over-all running time over routes reduced to the satisfaction of the passengers by taking advantage of the efforts of the executives who composed the report.

Counsel from Caledonia

SCOTCHMEN are world-renowned for thrift. They do not spend a penny wastefully. They are sometimes thrifty to the extent of being parsimonious, if one can believe popular tales. Yet the City of Glasgow has just been installing upholstered seats on all of its street cars; moquette on the lower deck and genuine leather on the inclosed upper deck. The wooden seats just discarded were as good as wooden seats can be. They and their predecessors had answered all requirements in Glasgow since street cars had run in that city on the Clyde. But in this day and for this generation they sufficed no longer. The automobile in its various forms was responsible for the change. As in other cities, the traveling public had become used to the upholstered seats on private cars and buses. The tramway receipts began to fall off. It was to meet this competition that the Glasgow trams were modernized with more comfortable seats and in other ways at a cost of nearly $5,000 per car.

Utilities in American cities that have not yet realized the need for meeting modern conditions can well consider this example. Automobiles are less expensive to buy and operate here than in Scotland and consequently are much more common. The average American is a spendthrift in matters concerning his personal comfort. In this particular, he is the antithesis of the canny Scot. Will electric railway companies here keep any considerable portion of their patronage if they continue to operate antiquated, slow and uncomfortable cars? The answer is that they cannot, when other means of transportation are available to the traveling public. Many railway companies understand the need for better service, but too many obsolete cars are still being used.

Making the Best Use of Available Information

COMMENDABLE indeed is the attitude of the committee appointed by the National Educational Association to investigate the use in schools of publicity material supplied by propaganda agencies and other organizations. The chairman of this committee, Dr. Edwin C. Broome, superintendent of Philadelphia schools, takes a moderate and unbiased position. He says that:

"There has been a growing tendency since the war, throughout the United States, to bring into the public schools of the country enterprises which, while they may be good in themselves, are not so sufficiently educational in value that they should be allowed to interfere with the plan and purpose of the public schools. Some of these enterprises are out and out advertising schemes. Others are propaganda, some good and some bad. Some are efforts to use the schools to raise money for various enterprises which may be good in themselves, but raise the question as to whether the public schools which the children are compelled to attend by law, should be fields for money raising or projects outside of the activities of the school."

The expressed purpose of the committee is to study constructively the question of how schools can bring themselves into closer touch with everyday life through the proper use of the vast amount of material which various organizations and agencies now have available for school use. The committee will endeavor to outline the principles which should guide school officials and teachers in using such material so that the children may be protected from onesided viewpoints and from exploitations for advertising purposes.

Certainly no reasonable person can take exception to this. Least of all will the electric railways raise any objection. The committee recognizes the desirability of bringing the schools into touch with everyday life—in which nowadays the public utilities play so important a part. That, indeed, is all that any one can ask.

Taxi Regulation Needed in Public Interest

DEFINITE suggestion that regulation of taxi-cabs is needed was made at the recent meeting of the National Association of Railway and Utilities Commissioners at New Orleans by President J. P. Barnes of the American Electric Railway Association, as told in the report of the meeting printed elsewhere in this issue. That the JOURNAL is heartily in accord with this suggestion was indicated by an editorial published in the issue of Nov. 10.

Of course, the inference is quite natural that street railway men have a selfish interest in the regulation of the taxi business. But their interest is not entirely a selfish one. Taxis operated by responsible, organized companies are not serious competitors of street cars. They render an entirely distinct class of service at a different level of rates. It is when cut-throat competition by more or less irresponsible operators forces taxi rates below the cost of giving service that the taxi deteriorates into little more than a jitney and invades the field of the mass transportation vehicle. This form of competition, though experienced in a number of cities, has so far done little serious harm to the street railways. It threatens to prove far more serious to the taxi business itself than to the other carriers with which taxis may compete.

It seems reasonable, therefore, to point out that suggestions of the need for regulation of taxi-cabs, coming from the street railway industry, are not dictated entirely by selfish motives. Although it is beyond the scope of this discussion to go into the details, it could be demonstrated readily that regulation would be extremely desirable from the standpoint of existing operators and manufacturers of taxi-cabs. It would exert a stabilizing influence, the lack of which has produced a high mortality rate in the taxi business during recent years. But above all, regulation is needed from the standpoint of the public interest. Reliability and responsibility of management soon break down under the influence of unregulated competition. Duplication of facilities and service produces inefficiency and waste. Then again, the cruising taxi, intent on picking up the stray passenger before a competitor sees him, is a large element in the traffic congestion on present city streets. These and many more factors indicate that the question of regulation is indeed a matter of public and not private interest.

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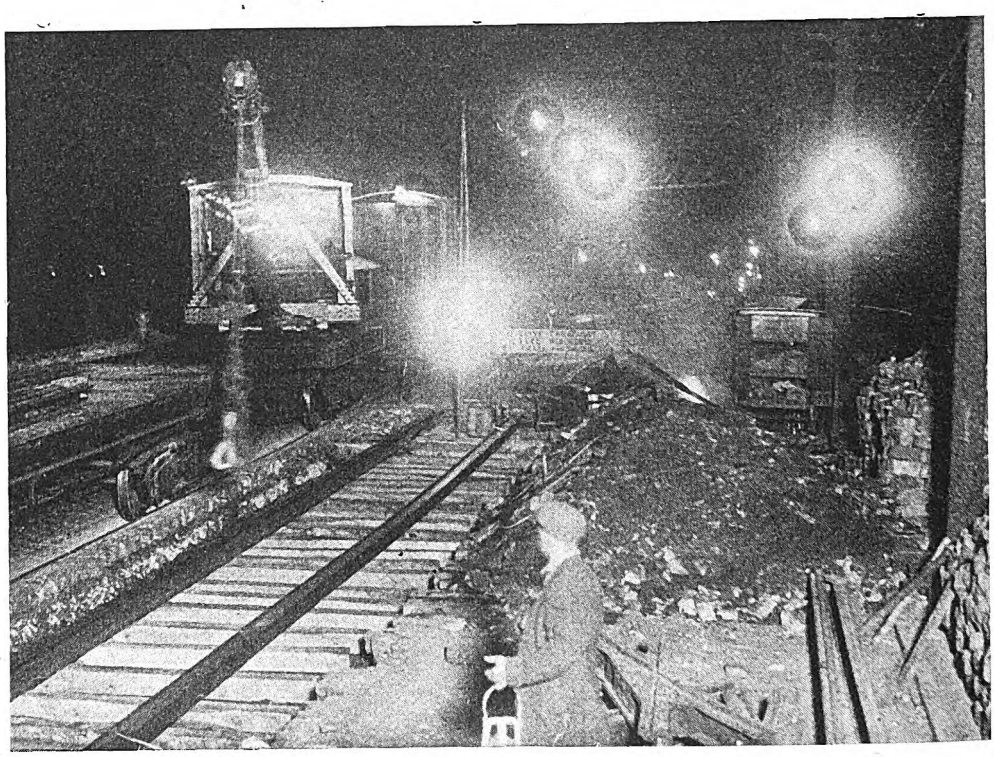
Buffalo Railway Invests Heavily in Street Improvements

I.R.C.'s reconstruction program is co-ordinated with the city's repaving program. New standards of track construction adopted for extensive program



Much of the reconstruction work in Buffalo is being done at night

RECONSTRUCTION of tracks and paving in the city of Buffalo has progressed rapidly. The International Railway, under Mitten management, mapped out a program for the current year involving an expenditure of $375,000, an amount 50 per cent more than the sum spent last year and more than has been spent for the past five years. In addition $400,000 is being spent this year, as was spent last year, on track and paving maintenance, bringing the total cost of the street improvement program to a point where it absorbs 7 cents of every dollar collected in fares, a limit beyond which the company does not feel it can go under present rates.

Several interesting features distinguish the International Railway program from the average job of this kind. In the first place, after the amount of money available has been determined, the streets on which it is to be expended are decided upon in a conference between city and company officials. The company does not arbitrarily make its own decisions regardless of the wishes of city officials or of civic associations. The importance of each street on which reconstruction is needed is considered carefully from the standpoint of general traffic as well as of street railway service. Thus, every interest is considered and the company's reconstruction program is co-ordinated with the city's street repaving program. This co-operative development of the track and paving reconstruction program has created much good will.

As soon as the streets to be repaired in 1928 were selected, the program was announced in the newspapers. Since the original announcement every effort has been made to keep the public informed regarding the progress of track and paving reconstruction and regarding the features that limit the company's ability to do such work. A part of this program of informing the public was the publishing in newspapers of weekly progress reports.

As each job was begun, a public relations representative of the company called on every resident and business man in the section, outlining the details of the company's arrangement for that particular job and assuring them that every effort would be made to minimize inconvenience. Much favorable comment followed this procedure.

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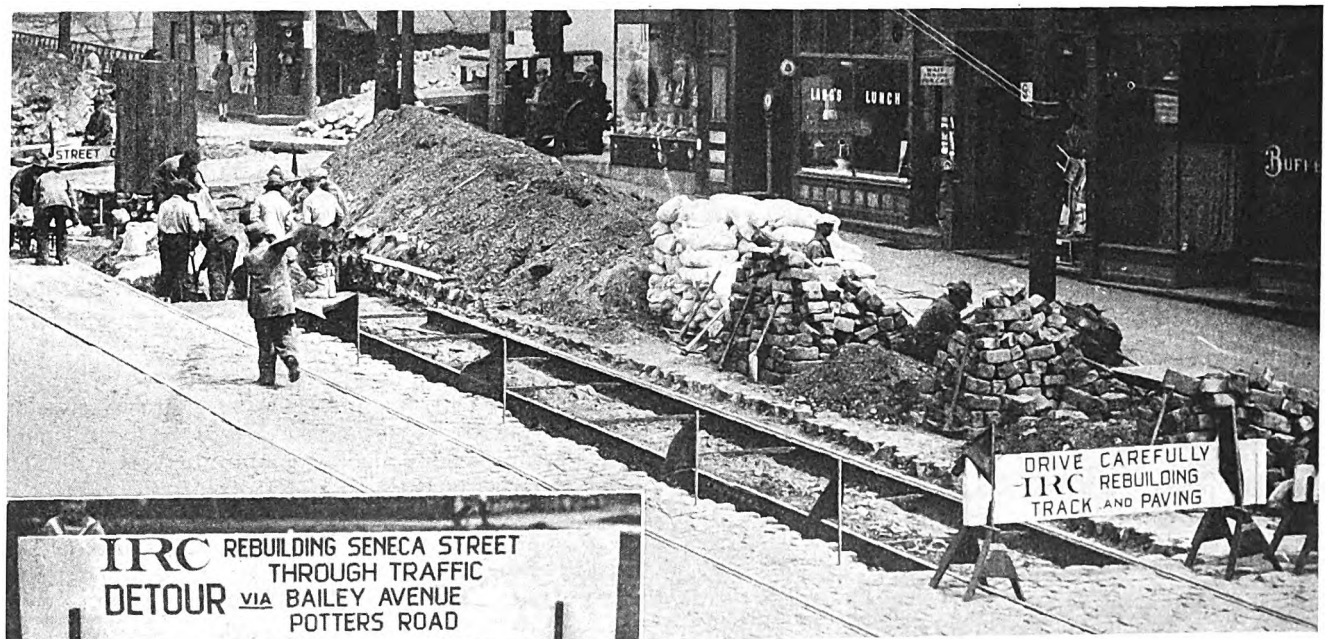
Traffic is diverted to other streets wherever possible to avoid congestion on streets being repaired



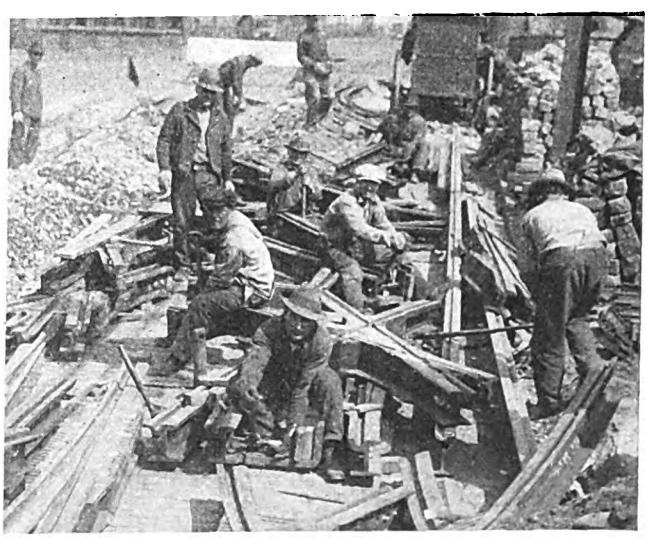
On some of the narrow streets the space for storing material is very limited

Similar information was given to the business associations in the various communities effected, with the result that the closest of co-operation was developed between these organizations and the railway. So favorable an opinion was created with one business men's association in whose district reconstruction was under way, that a resolution was passed unanimously urging that street railways be relieved of the paving obligation inherited from horse car days.

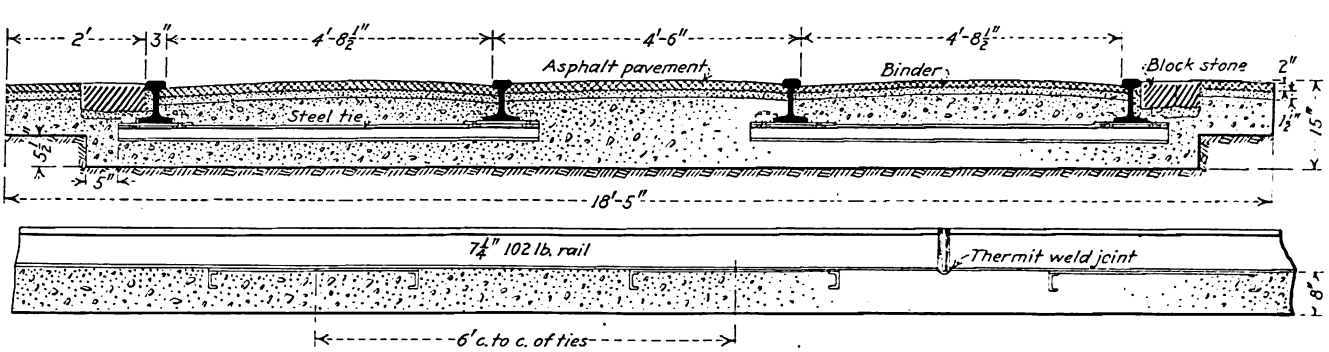
Signs Inform Public of the Railway's Track Activities

Although the International Railway had been spending large sums for maintenance in years past, it was discovered that little was known about this phase of the company's work. To keep the public informed, the company began last year to post signs at each location where track repairs, however minor, were under way. These signs read "Drive carefully, I.R.C. repairing track and paving." They were placed in all sections of the city where large or small gangs of company workmen were carrying on track or paving repairing. Favorable public reaction followed almost immediately.

The same idea was applied to the reconstruction program, except that large buckboard signs were employed. These signs read "Drive carefully, I.R.C. rebuilding track and paving." In co-operation with the Automobile



Preparing special trackwork for installation. At important intersections special work is installed by night crews



Cross-section of the new type of track construction adopted by the International Railway

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Club of Buffalo, detour signs were posted at dangerous points, greatly reducing the amount of traffic through the areas under construction.

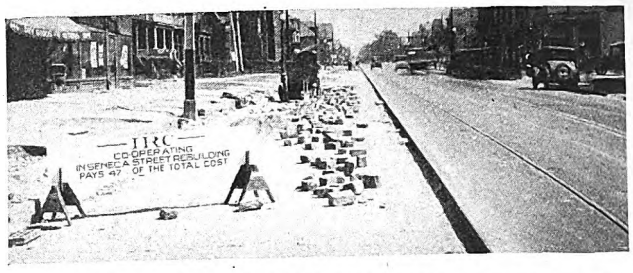
Railways in New York State are required by law to pave the area between the track and 2 ft. on each side. The total width of pavement, therefore, including a 5-ft. devil strip for which the railway is responsible, is 18 ft. 11 in. In a 49-ft. street the cost of the railway track and paving work is approximately 47 per cent of the total street improvement. This information is conveyed to car riders and to the public generally through buckboard signs and through ceiling signs displayed in the company's cars.

Bringing the track into line before pouring the concrete base

Most of the existing trackwork in the city of Buffalo is of grooved girder rail construction with blockstone between the tracks and in the devil strip. However, an improved type of construction, involving many changes in the old specifications, has been adopted for the work now under way. Among these changes are the use of T-rails, steel ties, Thermit-welded joints and asphalt pavement between the rails in place of blockstone.

International steel ties are being used on all new track construction work. They are being placed 6 ft. apart. The company is laying its rail on a concrete base, the distance from the ballast base to the top of the asphalt paving being 15 in. The concrete layer is 11½ in. thick.

Assembled track, aligned and ready for the concrete base



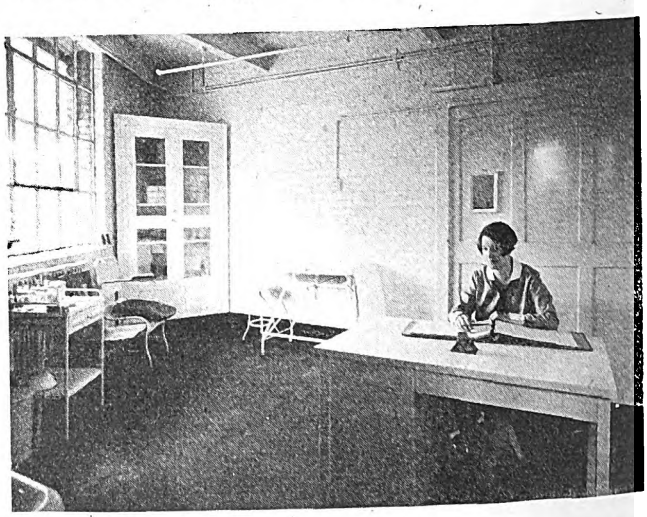
View of Seneca Street with the track reconstruction about completed. The sign calls attention to the fact that the I.R.C. is paying 47 per cent of the total cost

Over this is a 1½-in. layer of binder and a 2-in. layer of asphalt. The T-type rails being used are of standard gage, weigh 102 lb. and measure 7¼ in. high. All joints are Thermit welded, making one continuous rail. The devil strip between tracks is 4 ft. 6 in.

Asphalt is being used for street surfacing between rails in place of the old blockstone pavement, but a single row of the stone is placed for toothing on the outer rail of each track. The asphalt gives a far smoother surface between rails than the old blockstone paving and it has been made standard on all new work which is being done by the company.

At important intersections where special trackwork is required, such as crossovers, switches, etc., the International Railway uses night shifts to speed up the construction program and to eliminate delays caused by daytime traffic.

Medical Dispensary a Shop Feature



A corner of the carpenter shop closed off by the erection of tile walls provide the Kenmore shops in Akron with a simple, yet adequate, medical dispensary

WITH the fitting up of a corner of the carpenter shop of the Kenmore shops of the Northern Ohio Power & Light Company, Akron, Ohio, as a medical dispensary and first aid room, a new feature has been added. Two tile walls have been built in one corner to form a room 18x14 ft. The ceiling and walls have been finished with a high gloss, hospital white enamel; the floor has been covered with a brown and yellow fibre tile.

First-aid treatment is given at this dispensary and provision for the handling of necessary later surgical dressings has also been made. Medical supplies for the emergency first-aid kits used all over the system are stored at this centralized point.

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Horse-and-Buggy Speed

Will Not Do Today

Scientifically located stops, increased frequency of service, headways, traffic regulations, fare collection, better equipment, instruction of trainmen—all deserve consideration by electric railways from the standpoint of time saving

CONGESTION, inadequate traffic regulation, slow-moving trucks and wagons, and street cars are among the principal hindrances to traffic movement in large cities. The remedies in the cases of the first three apparently are radical ones, but the street car is physically capable of higher speeds—of such speeds as are regarded safe on city streets—and need not remain in this category of delay producers. Every increase in the over-all speed of the street car, it should be remembered also, will automatically speed up the flow of all vehicular traffic, and thus make possible easier and still faster street car operation. With this foreword, the committee on service betterment of the American Electric Railway Transportation and Traffic Association introduced a report that is a "mine" of ideas for increasing the speed of operation.

Many ideas have been advanced previously, but most of them have been more or less impracticable and have involved too great cost. The underlying thought in the suggestions in this report was to present ways and means of reducing the running time which could be easily effected and which involved no great expenditures. An abstract of this report was published in the Sept. 29 issue of the JOURNAL. The subject is one of such interest and importance, however, that a more comprehensive treatment of the report appears warranted.

The foreword of the report is followed by a brief editorial treatment by the committee on the subject, after which the sources of increasing speed are outlined. The rapidly developed competition which the railway industry is facing from the low-priced automobile and the public's demand for better service has created a need for a definitely improved type of street railway service rather than for a superficial refinement of the old. The American people no longer marvel at the space-annihilating inventions of the Twentieth Century, such as the radio and motor vehicle, and have become impatient with anything which does not compare favorably with the newer means of travel and communication. With transportation revolutionized in the past ten years, it is absurd to attempt to place in competition with the new modes of travel the same railway equipment and operating policies which were considered the last word in "horse-and-buggy" days. The street car operating at 9 m.p.h. was an immense improvement over the horse-drawn vehicle traveling at 6 m.p.h., but this speed cannot compete with the average of 12 to 15 m.p.h. easily attained by the ordinary automobile of today in traffic. People who are accustomed to averaging 12 to 15 m.p.h. through city streets in their own cars object to the relatively low speed of the street car. The consequence is that street railways continue to lose their patrons to the motor vehicle.

With the market already flooded by low-price, speedy automobiles within the reach of almost every citizen, and with a veritable deluge in the offing, the street railway industry, if it is to regain its former pre-eminence as a means of mass transportation or even to maintain its present position, must supply a service which satisfies this demand of the public for rapid riding.

SOURCES OF SPEED IMPROVEMENT

It cannot be too strongly emphasized that the problem of securing faster operation covers everything that happens to a car between terminals. Approached with this idea, the analysis discloses four main sources of speed improvements: (1) Increasing the proportion of car-run time during which cars can move at a maximum free running speed, and by making full use of such time; (2) reducing the time spent at stops; (3) installing superior mechanical equipment, and (4) training car operators to utilize to the full, opportunities for increasing speed. The means of increasing time during which cars can move at maximum free running speed may be classed, in turn, under the headings: Reduction in number of passenger stops, scientific spacing of cars and location of time points, and traffic regulation.

REDUCTION IN NUMBER OF PASSENGER STOPS

Continuous motion at top speed between terminals is neither a practicable nor a desirable ideal, but reduction in the number of passenger stops is not only feasible but is an important means of increasing speed of operation. In eliminating stops in congested areas, however, it must in all cases be remembered that here the short rider is found, and that if forced to walk in search of a stop he may continue walking to his destination.

Stops to take on passengers can be reduced in number in two ways—directly, by eliminating stopping points, and indirectly, by increasing service. Several methods of eliminating stops have been successfully used in various circumstances. Though reference is made hereafter to the "skip-stop" plan, the "staggered skip-stop," etc., the public use of such terminology is not recommended. The terms are used here for the sake of clarity, but it is believed some other terminology should be devised which would not suggest the idea of less convenient service.

Relocation of Stops—Speed of operation can be increased by reducing the number of fixed stopping points and relocating them at so many per mile. These stops

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MEMBERS of the Service Betterment Committee, responsible for the report, are: W. E. Wood, president Virginia Electric & Power Company, chairman; A. C. Spurr, general manager Wheeling Traction Company, vice-chairman; R. N. Graham, Pennsylvania-Ohio System, sponsor; Paul E. Wilson, Cleveland Railway, sponsor; J. L. Alexander, Houston Electric Company; A. J. Boardman, Eastern Massachusetts Street Railway; J. F. Craig, Westinghouse Traction Brake Company; L. C. Datz, St. Louis Public Service Company; L. J. DeLamarter, Grand Rapids Railroad; C. H. Evenson, Chicago Surface Lines; D. L. Fennell, Kansas City Public Service Company; D. J. Graham, Winnipeg Electric Company; J. H. McClure, Cincinnati, Hamilton & Dayton Railway; Joe R. Ong, Cincinnati Street Railway; E. A. Palmer, Westinghouse Electric & Manufacturing Company; D. A. Scanlon, Northern Ohio Power & Light Company; D. A. Smith, Department of Street Railways of Detroit; Charles H. Strong, Georgia Power Company; J. C. Thirlwall, General Electric Company; W. E. Thompson, Third Avenue Railway; Claude L. Van Auken, Electric Traction, and C. W. Wilson, Pittsburgh Railways.

need not necessarily be evenly spaced, but should be located at sites which scientific analysis indicates will serve the maximum number of passengers.

Skip-Stop Plan—Some cities have increased car speeds by using a skip-stop peak operation, while making all stops during off-peak hours. Under this plan all stops are made during the off-peak hours, and only every other stop during rush hours. Operation during congested periods is thus automatically speeded up. Use of this plan in off-peak hours is possible, but is unnecessary because many stops are not actually made.

Staggered Skip-Stop—This plan is similar to the skip-stop arrangement except that during the peak hours and in the off-peak hours, if desirable, a stop is made inbound at one stop and outbound at the next. Any inconvenience to car riders is equalized by this scheme.

Express Street Car and Local Bus Operation—Express service, with local bus operation in support, is under experiment in more than one city. Generally, the street cars, being the more economical means of mass transportation, are operated on express service supported by bus operation for local stops.

Express Street Car and Local Street Car Operation—Another type of express service is a combination of local and express cars on the same tracks. Such service is suitable only in territory where present headways are not too short and where a fairly infrequent local-car service can be applied.

Reducing Stops by Increasing Service—It is possible to increase average car speeds by providing a shorter headway between cars. Putting more cars on the routes means less passengers per car, and consequently, decreases the number of stops which each car has to make, and also the time spent at stops, since fewer passengers board and leave each car.

Frequency of service can be economically increased through the operation of one-man cars. To realize to the full the increased speed potentialities of such one-man operation, it is essential that the most efficient car equipment possible be used.

Scientific Spacing of Cars and Location of Time Points

To realize on the maximum speed possibilities afforded by the free running time, a system of car spacing is essential. Time points and spacing signals are the devices generally employed to space cars. In this connection some success has been had with dispatching.

Time Points—It is unsound to locate time points in an arbitrary manner, rather than in accordance with the carefully analyzed requirements of a situation. The effect of too frequent time points is to slow down cars. A technical study of each property should identify those elements which retard speed and disclose opportunities for securing faster speeds over certain portions of the runs. Traffic conditions vary widely over a city. Even near-by streets differ greatly in traffic density and, consequently, in speed of traffic. The physical barriers to speedy operation met on certain thoroughfares, such as steep grades, small radius curves, congested throats, frequent intersections, etc., should all receive consideration in the selection of time points.

Spacing Signals—Automatic, electrically operated signals, properly located, can be used to keep cars properly spaced and to enforce adherence to schedules. When spacing signals are used, cars are dispatched at regular intervals and the automatic changing of lights along the route from red to green informs the operator as to whether he is ahead or behind schedule.

Headway Recorders—When the effort to maintain equal spacing of cars is confined to the use of a definite schedule and of inspectors for handling emergencies, the apprehension of incipient trouble is not usually possible, inasmuch as the inspection forces are limited in number in comparison with the territory which must be covered.

By means of certain mechanical devices for recording headway, it is possible to obtain an indelible record of the cars passing and of the time of their passing a certain point. These devices make possible a centralized control of car spacing, and detect incipient service failures much earlier than is possible by a system of personal inspection.

Decreasing Running Time—On routes where increased service is not warranted by the traffic, and where, consequently, slow running time is provided, it may be advisable to provide faster movement, to reduce the actual running time and provide a cushion in the form of longer layovers to absorb delays.

Traffic Regulation An Important Factor

Proper traffic regulation, which makes possible more advantageous use of thoroughfares, is an important means of securing faster car operation.

Traffic Control Signals—The stationing of a traffic officer or the installation of electric "Stop" and "Go" signals on congested streets will usually expedite traffic movement, provided adjustment to the respective volumes of the intersecting traffic lines is made. In busy sections, the installation of some co-ordinated signal control system may prove successful, as it has in several cities. However, if the traffic volume does not warrant signals, and if the signals installed are not some form of the co-ordinated type, they may prove an obstacle to rapid traffic movement.

Police Co-operation at Crossings—The co-operation of the police in keeping the tracks at stops clear of other

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Sources of Speed Improvement

I — Increasing the proportion of car-run time during which cars can move at maximum free running speed

A—Reduction in number of passenger stops.

1—Eliminating stops
- (a) Relocation of stops
- (b) Skip-stop plan
- (c) Staggered skip-stop
- (d) Express street car and local bus
- (e) Express street car and local street car

2—Reducing stops by increasing service

B—Scientific spacing of cars and location of time points.

1—Time points
2—Spacing signals
3—Headway recorders
4—Decreasing running time
5—Street supervision

C—Traffic regulation.

1—Traffic control signals
2—Police co-operation at crossings
3—One-way streets
4—Parking restrictions
5—Heavy merchandise loading
6—Elimination of left turns
7—Segregation of traffic
8—Terminals
9—Street car loading zones
10—Protection of important street car arteries
11—Staggered closing hours

II—Reducing the time spent at stops

A—Loading and unloading passengers.

1—Collection of fares
- (a) Advance sale of fares (ticket, token, pass)
- (b) Odd-cent fares
- (c) Transfer system
- (d) Hand registers
- (e) "Pay-as-you-pass" collection
- (f) "Pay-enter" and "pay-leave" collection
- (g) Motormen as fare collectors
- (h) Street collectors
- (i) Queue loading

2—Car body design—to aid passenger flow
- (a) Doors
- (b) Seats
- (c) Car steps
- (d) Space around fare box

3—Berthing

B—Position of stops.

1—The near side stop
2—The far side stop
3—Mid-block stops

III—Installing superior mechanical equipment

A—Cars.

1—Motive power
2—Braking
3—Warning signals
4—Car body design

B—Track layout.

C—Power.

D—Emergency and wrecking facilities.

IV—Training car operators to use opportunities to the full

A—Training for speed.

B—Trainmen as salesmen.

C—Schedule testing crews.

vehicles, and in giving the street cars the right of way over other traffic by changing signals at proper moments, will expedite car operation. Lights to signal the officers that the car is ready to go could be used to advantage in this connection.

Parking Restrictions—Traffic authorities are agreed that the street space now available is not used to the best advantage and that economic losses result from the unnecessarily retarded traffic movement. Primarily, streets are constructed for moving traffic, so that their use for storage purposes should be allowed only when such use does not interfere with traffic. Consequently, in congested districts parking should be restricted. On the very busiest thoroughfares it may be necessary to prohibit parking entirely during the day. This may arouse opposition among merchants and automobile owners, but an educational campaign may be conducted to show the advantages of parking prohibition.

Heavy Merchandise Loading—The restriction of heavy loading on congested streets to certain hours of the day or night or to adjacent alleys should eliminate many unnecessary delays. End-gate unloading from vehicles backed at right angles to the curb should never be permitted on busy streets, as this practice interferes with all traffic on the street. Heavy commercial operations, such as the delivery of coal and other bulky material and the collection of garbage and rubbish, could be restricted, with advantage, to the night hours.

Segregation of Traffic—The segregation of types of traffic is worthy of consideration. In all probability only partial segregation is possible at present, including prohibiting the use of the more important thoroughfares to certain types of vehicles during the rush hours.

Terminals—Underground, elevated, or street-level terminals may be advantageous in congested areas of some large cities. These would allow centralized control and dispatching of cars and, by taking cars from the congested streets, would eliminate many traffic delays.

Prepayment areas, equipped with turnstiles, can be used to expedite loading at terminals and at parks and on private rights-of-way. Since fares are collected at the areas before the car arrives, passengers enter the cars without delay. Provided these areas are equipped with exit facilities, they may be used for unloading purposes, as well, thus speeding up "pay-as-you-leave" car movement.

Street Car Loading Zones—The creation of street car loading zones, with proper traffic regulations in support to allow by-passing, should relieve congestion and tend to increase the speed of street car operation. Car loading is facilitated by loading zones, since they enable patrons, unhindered by passing automobiles, to be at the doors of cars when they come to a stop.

Protection of Important Street Car Arteries—Cars can be operated with safety at higher speeds when regulations protect street car arteries from sudden intrusions of cross-street traffic. The boulevard-stop plan, requiring all traffic to come to a complete stop before entering certain thoroughfares, will give this protection.

Means of Reducing Time Spent at Stops

The second large source of time saving is found in the passenger stop. Cars cannot be in motion at all times. They must stop to take on and let off passengers. The elimination of waste motion at the stops which have to be made is therefore an integral part of the general problem of increasing speed.

The loading and unloading of passengers is a factor in this phase of the problem which offers great opportunity for time saving. The problem of handling passengers

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divides itself into the sub-problems of fare collection, the provision of facilities which expedite passenger flow, and berthing.

Collection of Fares

Advance Sale of Fares (Ticket, Token, Pass)—Wherever possible, passengers should be induced to buy tickets or tokens in quantity. This practice could be encouraged through publicity and by allowing a sufficient differential between the cash and the token or ticket fare. Some properties are using the pass in various forms—weekly, Sunday, holiday, etc. It has been found to be an agent for expediting movement of passengers through the elimination of cash and transfer transactions between operator and passenger.

Odd-Cent Fares—A great deal of delay at stops is caused by change-making transactions. This source of delay cannot be eliminated entirely, but much can be done to make these transactions as simple as possible.

Hand Registers—Hand registers sometimes continue in use more because of precedent than because of their actual value. The time losses for which they are responsible should be fully realized, and, where feasible, more modern registration devices should be installed. Hand registration can in some instances be abandoned without loss.

"Pay-As-You-Pass" Collection—On center door cars, a "Pay-As-You-Pass" fare collection has been found in some instances to speed up the handling of passengers.

"Pay-Enter" and "Pay-Leave" Collection—The system of "pay-enter" collection on cars inbound to the business center and "pay-leave" collection on outbound cars has reduced delay in many cases by distributing the work of the fare collector over the line rather than concentrating it at the busy terminal.

Motormen as Fare Collectors—Motormen on two-man cars can sometimes be utilized to inspect passes, collect exact fares and transfers.

Street Collectors—Passenger movement may be expedited in congested districts by having unattended doors of one-man cars and the door at the motorman's position on two-man cars attended by a fare collector, at least for transfer transactions.

Queue Loading—Queue loading has been used at certain heavy loading points to speed up passenger loading, particularly at factories. This method allows only one passenger to enter the car at a time and also reduces the number of accidents and fare losses.

Car Body Design—To Aid Passenger Flow

The design of some types of cars has been a direct hindrance to the expeditious handling of passengers rather than an aid. If increased speed is to be obtained it is essential that all parts of a car should be designed to contribute to the rapid handling of passengers.

Doors—Doors should be placed where they facilitate ingress and egress, should be adequate in width, and should be equipped with devices that make quick operation possible. The feasibility of eliminating doors entirely, as has been done in several instances, is also worthy of attention.

The over-emphasis on safety is particularly noticeable in the case of door operation. On many properties, the doors are kept closed until the car comes to a stop and they are closed before cars are started again. In some instances interlocking devices have been installed, making it impossible to operate cars with the doors open.

Investigation would probably show that accidents due to open-door operation are negligible. The gain in speed which should result from such operation makes its use a matter deserving of careful attention, especially in congested areas where frequent stops are made.

Space Around Fare Box—A large open floor space around the fare boxes is conducive to the expeditious handling of passengers at heavy loading points.

Berthing—Some cities have speeded up car movement by berthing their cars at stops or by providing parallel loading tracks at heavy loading points. Under these methods a car does not have to wait until the car or traffic ahead moves on before it can receive or discharge passengers.

Position of Stops Affects Speed

Different traffic conditions and street situations require different stop locations. Stops may be located at the near or far side of an intersection (i.e., just short of the crossing or just beyond it) or in mid-block.

The Near-Side Stop—The near-side stop is preferable in most instances since in general it offers less interference to traffic and eliminates unnecessary stops. At practically every street crossing traffic proceeds in four directions, with vehicles turning constantly from one line of traffic into the lines moving at right angles to it. Since the near-side stop halts only one of these lanes and backs this traffic up within the block instead of the intersection, the other three lanes are free to proceed. At many intersections cars have to stop in any case at the near side of the crossing, either because of traffic control or because of cross traffic; therefore, at ordinary crossings it is believed to be unwise, generally, to locate the car stop at any other position, thus frequently forcing a car to stop twice in a block.

The Far-Side Stop—Stops at the far side of intersections are particularly suitable where streets or car lines diverge, for these stops enable traffic bound in a direction different from that of the loading car to proceed on its way without delay. If traffic is heavy, however, a line of traffic may extend across the intersection, thus stopping both traffic lanes. At "Y" intersections and on streets of adequate width to permit vehicular by-passing, this objection is not serious.

Mid-Block Stops—The mid-block stop can be used in light traffic sections to make one stop take the place of two located at both ends of the block, or in special circumstances, as when street or track repairing is under way. With this type of stop, however, it is frequently necessary for traffic to stop at the ends of the block also in cases where traffic is controlled or where cross-street traffic is heavy. Moreover, the mid-block stop tends to increase jay-walking, which many cities are attempting to eliminate.

Superior Equipment a Means of Increasing Speed

The discussion so far has dealt primarily with ways and means of securing superior performance out of present equipment. It is believed that perfect performance of this equipment will be found inadequate to meet the stiff automobile competition, and that fast, lightweight, strictly modern cars, more power, and better maintenance are necessary, also, to enable the railway industry to maintain its position, not to speak of winning back lost ground.

Motive Power—Ample motor capacity, with a proper gear ratio to enable a car to take and keep its place in fast-moving traffic at all times during the day, is essential.

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To prevent automobiles from getting ahead of cars after a traffic stop, and thus from swinging onto the tracks and blocking rail traffic, the cars must be equipped to accelerate at least as rapidly as the automobiles.

Braking—The attainment of faster speeds must be accompanied by corresponding developments in deceleration. For cars to maintain high speeds between stops, brakes must provide rapid deceleration. The increased hazards developed by increased speeds must be counteracted by superior braking. In this connection, variable load, dynamic and magnetic braking, and other devices are in operation and are being further developed.

Warning Signals—Instead of the traditional gong, up-to-date warning signals operating by air or electricity may be installed. These signals can be heard above the din of present-day traffic, and should aid materially in moving the cars over congested streets.

Track Layout—Improper track layout and poor maintenance create delays which slow down car movement. Non-clearance curves and improperly located sidings on a single track make it physically impossible to maintain fast schedules. Switches that give the crews trouble in throwing, bad curves, run-down special work, and low joints in particular make low speed necessary. Hand signals should be replaced by automatic signals, so that operators need not leave their cars to operate them. Automatic switches should also be installed wherever possible.

Emergency and Wrecking Facilities—The effect of higher speeds will be occasionally lost unless an efficient emergency and wrecking service is available to keep the tracks open in case of breakdown or blockade. Adequate maintenance and inspection of the cars and overhead lines, by decreasing breakdowns, will aid in keeping the cars on schedule.

Increasing Speed by Educating Car Operators

Training for Speed—Car operators must be trained to take advantage of every opportunity for rapid operation, if the full possibilities of increased speed are to be realized. In the past, safe handling of the cars and safety in general have at times been over-emphasized and the need of reasonably rapid operation has been unduly subordinated.

To obtain the full benefits from the measures and methods proposed for securing decreased running time, it will be necessary to impress upon the trainmen the importance of greater speed and convince them that it can be obtained without sacrificing safety. Confidence in the ability of the brakes to stop the cars in emergencies must be instilled in the operators' minds. They must receive training in the rapid acceleration of cars, so as to enable the cars to start at "GO" signals before other vehicles, and to remain ahead of them between stops.

Improvement in the handling of passengers can be secured if the platform men are trained to call stops clearly and in advance, to supply information in a courteous manner concerning the use of doors, the importance of moving up into the cars away from the platform, etc.

Trainmen as Salesmen—The platform men are the salesmen of the railway industry, the medium through which personal contact between the management and the public is made possible. In order that they may contribute intelligently toward the solution of the problems facing the industry, such as speed, they should be acquainted with the facts of operation.

Instruction in courtesy, cleanliness, loyalty and honesty is essenital, but for the men to be in position to co-operate most effectively with the management, they must also be informed concerning its problems. When the trainmen understand the competition which the street railway industry must meet from motor vehicles, and the necessity which has been forced upon it to increase the speed of its operation, then these trainmen will utilize those seconds of delay, which, soon mounting up into minutes, now cause the street car to lag so far behind the automobile.

Schedule Testing Crews—Something beyond mere planning for speed of operation and endeavors to sell to trainmen the idea of speed is necessary to secure complete and uniform accomplishment. The years of relatively slow operation have imprinted in the minds of some train operators rather permanently the idea that speed such as is necessary will be difficult to attain. A corps of engineer-operators or expert trainmen who are available, when the study of a line indicates that a certain speed can be maintained, to take over the line and by actual operation demonstrate the feasibility of the schedules suggested, would without doubt form a highly effective means of increasing speed on a system.

Mitten Tours Open Additional Terminal

Auxiliary terminal for Mitten Tours at 1432 Market Street, Philadelphia

TO CARE for its growing long-distance motor coach business the Philadelphia Rapid Transit company recently opened another terminal and waiting room at 1432 Market Street, Philadelphia. This location, which is adjacent to the Mitten Bank, is opposite the Broad Street Station of the Pennsylvania Railroad Company and close to the City Hall. The main terminal at Broad and Locust Streets will continue, but all buses for New York, Atlantic City, Washington, Wilmington, Doylestown and Valley Forge will stop at the new terminal on their way in and out of the city. A complete information bureau will also be maintained here and tickets will be sold to all points served by the extensive Mitten Tours system.

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Vienna Helps the

THE view above shows earlier and more common form of stop sign at a double berthing street platform. The numbers relate to car routes.

GEMEINDE WIEN—
STADT STRASZENBAHNEN

FAHRPLÄNE
UND
FAHRPREISE
DER
STADT. VERKEHRSMITTEL

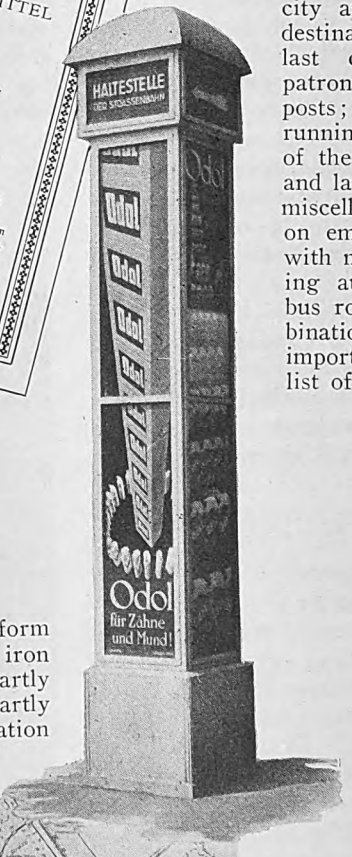
Direktion: Wien, IV., Favoritenstraße Nr. 9.
Fernsprecher: 32-5-80.

In den Wagen gefundene Gegenstände können am folgenden Tage im Fundbureau der Polizeidirektion, Wien, IX., Roßauerlände Nr. 7/9, behoben werden.

Das Beschwerdebureau der Straßenbahnen befindet sich Wien, IV., Favoritenstraße Nr. 9.

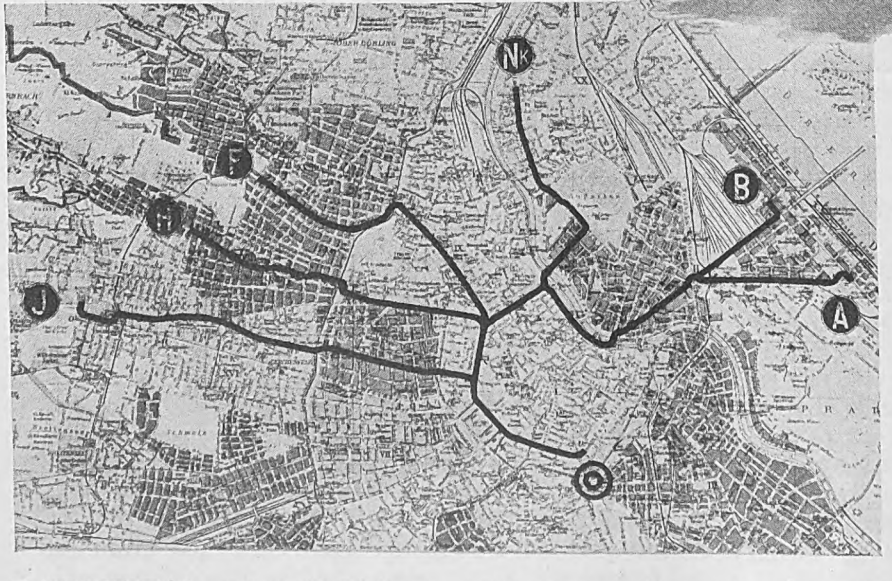
Preis 40 g.

THE center view at the left shows the front page of "Information for Passengers" booklet sold for about one and one-half fares. The front page carries directions concerning lost articles and complaints. Consecutive pages give respectively: General data on the city and system; fares; route marks, destinations, running time and first and last cars; miscellaneous hints for patrons, including pictures of "stop" posts; order of stations and inter-station running times with first and last trains of the rapid transit "Stadtbahn"; first and last cars on individual city routes; miscellaneous regulations, including note on emergency brake; motorbus routes with map and description of ticket-selling automatic machines; schedules of bus routes; best single routes or combinations of transport services to reach important places and on the last page a list of ticket agencies.



AT THE right is a later form of "stop" post made of iron with painted glass panels, partly to carry advertising and partly to give the traffic information hereinafter presented.

DIRECTLY over each map is a list of the stops on the routes pictured, outbound or inbound, from the particular stop where this is posted. These stop names are painted on a glass panel. The data include first and last cars.



Haltestellenverzeichnis

Haltestelle Kolowratring - Schwarzenbergplatz Gleis II.

Linie A :	Linie B :
Schwarzenbergplatz	Schwarzenbergplatz
Kärntnerstraße	Kärntnerstraße
Operngasse	Operngasse
Babenbergerstraße	Babenbergerstraße
Bellariastraße	Bellariastraße
Stadiongasse	Stadiongasse
Rathaus	Rathaus
Universität	Universität
Hoßgasse	Hoßgasse
Wipplingerstraße	Wipplingerstraße
Franz Josefs Kai	Franz Josefs Kai
Salztorbrücke	Salztorbrücke
Marienbrücke	Marienbrücke
Schwedenbrücke	Schwedenbrücke
Aspernbrückengasse	Aspernbrückengasse
Rotensterngasse	Rotensterngasse
Praterstern (Heinestraße)	Praterstern (Heinestraße)
Praterstern (Ausstellungsstraße	Praterstern (Lassallestraße
Venediger Au	Wolfgang Schmälzlgasse
Molkereistraße	Radingerstraße
Sebastian Kneippgasse	Walcherstraße
Santa Luciaplatz	
Erster Zug der Linie : 5'39	Erster Zug der Linie : 5'29
Letzter Zug der Linie: 0'08	Letzter Zug der Linie: 0'02

INDIVIDUAL maps of this kind are placed on a panel of the new "stop" columns to show the course of every route (outbound or inbound as the case may be) from the point where the map is displayed.

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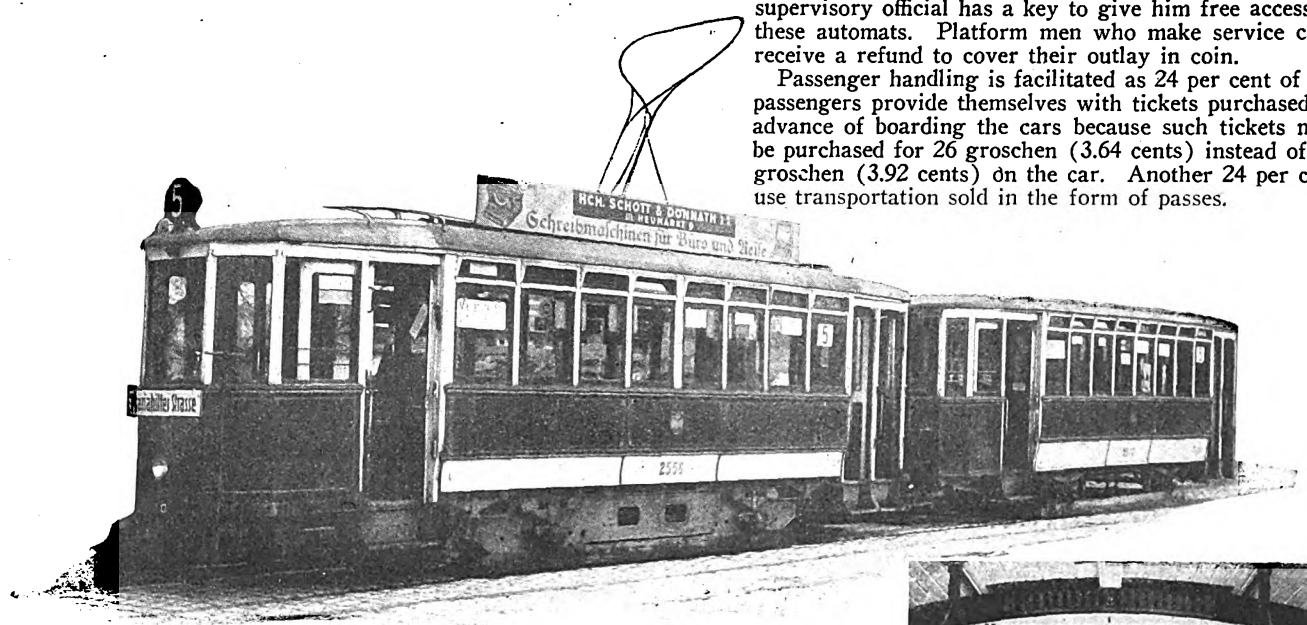
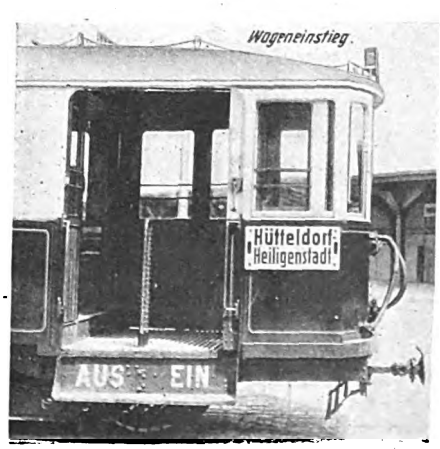
Passenger to USE ITS SERVICE

AT MORE important points, are handsome glazed shelters, in which system time tables are posted, reading in 24-hour time. A number of these stations are combined with automatic telephone booths. By agreement with the telephone company, the original street railway telephones have been discarded. Each supervisory official has a key to give him free access to these automats. Platform men who make service calls receive a refund to cover their outlay in coin.

Passenger handling is facilitated as 24 per cent of the passengers provide themselves with tickets purchased in advance of boarding the cars because such tickets may be purchased for 26 groschen (3.64 cents) instead of 28 groschen (3.92 cents) on the car. Another 24 per cent use transportation sold in the form of passes.



AS THE car approaches, the passenger is apprised of the route name by the front dasher sign and by the illuminated route number over the hood. As the car stops, he can read a window placard which supplements the route name by giving the main streets or places passed. The route number is repeated by a window marker and is also on the rear hood.



Prater Lusthaus
über Opernring Erdbergstr.
Kaiser Josefs-Brücke

THIS is a typical window card. It shows that the Prater Lusthaus (pleasure pavilion) is reached via Opera Belt, Erdberg St. and Kaiser Joseph's Bridge.

THE shape of the Stadtbahn car vestibules leads to the placing of the destination signs off-side as shown. It will be noted that the dividing rail on the platform is wound with wire to give a firmer hold to the passenger. The division for entrance and exit has proved impracticable, but the rail is retained because of its value as a support.

INSIDE a city car, the passenger can orient himself by reading the inner side of the route card. On the Stadtbahn, the name appears over the doorway. Note the use of cabinets for the control equipment.

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Erste und letzte Züge der Stadtbahnlinien an Werktagen.

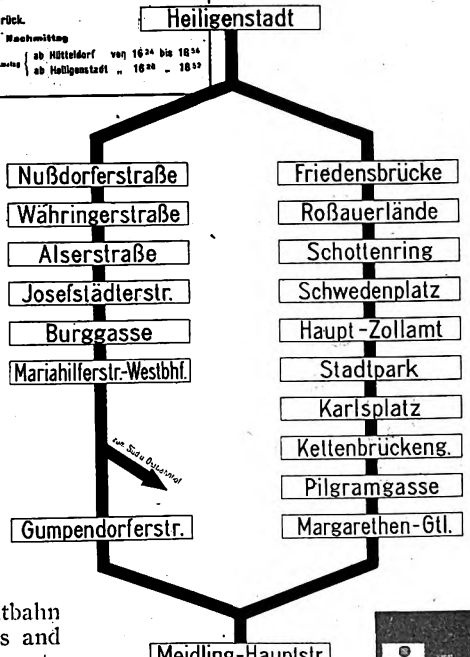
Erster Zug					Letzter Zug					Stationen	Erster Zug				Letzter Zug	
WD		DG		DG	DG	WD					GD	GD	WD	GD	GD	WD
5 00	. .	. .	. .	. .	. .	23 00	. .			ab Hütteldorf-Hacking . . . . . an	5 45	. .	5 55	. .	. .	23 40	. .
5 08	. .	. .	. .	. .	. .	23 08	. .			Ober St. Veit	5 41	. .	5 51	. .	. .	23 47	. .
5 10	. .	. .	. .	. .	. .	23 10	. .			Unter St. Veit-Baumgarten	5 38	. .	5 51	. .	. .	23 48	. .
5 12	. .	. .	. .	. .	. .	23 12	. .			Braunschweiggasse	5 37	. .	5 49	. .	. .	23 46	. .
5 14	. .	5 18	. .	22 38	23 10	23 14	. .			Hietzing	5 35	5 43	5 47	6 07	. .	23 33	23 41	. .
5 16	. .	5 20	. .	22 40	23 12	23 16	. .			Schönbrunn	5 33	5 41	5 45	6 05	. .	23 31	23 39	. .
5 18	. .	5 22	. .	22 42	23 14	23 18	. .			Meidling-Hauptstraße	5 31	5 39	5 43	6 03	. .	23 29	23 37	. .
5 21	. .	5 25	. .	22 43	23 17	23 21	. .			Margaretengürtel	5 28	5 36	5 40	6 00	. .	23 26	23 34	. .
5 23	. .	5 27	. .	22 47	23 19	23 23	. .			Pilgramgasse	5 26	5 34	5 38	5 58	. .	23 24	23 32	. .
5 25	. .	5 29	. .	22 48	23 21	23 25	. .			Kettenbrückengasse	5 24	5 32	5 36	5 56	. .	23 22	23 30	. .
5 28	. .	5 32	. .	22 52	23 24	23 28	. .			Karlsplatz	5 21	5 29	5 33	5 53	. .	23 21	23 27	. .
5 30	. .	5 34	. .	22 54	23 26	23 30	. .			Stadtpark	5 19	5 27	5 31	5 51	. .	23 19	23 25	. .
5 32	. .	5 36	. .	22 56	23 28	23 32	. .			Hauptzollamt	5 17	5 25	5 29	5 49	. .	23 17	23 23	. .
5 34	. .	5 38	. .	22 58	23 30	23 34	. .			Schwedenplatz	5 15	5 23	5 27	5 47	. .	23 15	23 21	. .
5 36	. .	5 40	. .	23 00	23 32	23 36	. .			Schottenring	5 13	5 21	5 25	5 45	. .	23 13	23 19	. .
5 38	. .	5 42	. .	23 02	23 34	23 38	. .			Roßauerlände	5 11	5 19	5 23	5 43	. .	23 11	23 17	. .
5 40	. .	5 44	. .	23 04	23 35	23 40	. .			Friedensbrücke	5 09	5 17	5 21	5 41	. .	23 09	23 15	. .
5 46	. .	. .	. .	. .	. .	23 46	. .			an Heiligenstadt . . . . . ab	. .	. .	5 15	. .	. .	23 00	. .
DG	18 G		18 G			18 G							18 G		18 G	18 S
. .	5 24		22 12			23 40				ab Heiligenstadt . . . . . an			5 21		6 17	23 37	
. .	5 28	5 48	22 17	23 09	23 41	23 45				Nußdorferstraße	5 04	5 12	5 16	5 36	6 12	23 04	23 32	
. .	5 31	5 51	22 19	23 11	23 43	23 47				Währingerstraße	5 02	5 10	5 14	5 34	6 10	23 02	23 30	
4 36	5 34	5 54	22 22	23 14	. .	23 50				Alserstraße	. .	. .	5 11	5 31	6 07	22 58	23 27	23 55
5 00	5 36	5 56	22 24	23 16	. .	23 52				Josefstädterstraße	. .	. .	5 08	5 29	6 05	22 57	23 25	23 53
5 02	5 38	5 58	22 26	23 18	. .	23 54				Burggasse	. .	. .	5 02	5 27	6 03	22 55	23 23	23 51
5 04	5 40	6 00	22 28	23 20	. .	23 56				Mariahilferstraße-Westbahnhof .	. .	. .	5 00	5 25	6 01	22 53	23 21	23 48
5 08	. .	6 02	. .	23 22	. .	. .				Gumpendorferstraße	. .	. .	. .	5 23	. .	22 51	. .	23 47
5 08	. .	6 05	. .	23 25	. .	. .				Meidling-Hauptstraße	. .	. .	. .	5 20	. .	22 48	. .	23 44
. .	5 48	. .	22 36	. .	. .	0 04				Steinbauergasse	. .	. .	. .	. .	5 55	. .	23 13	. .
. .	6 01	. .	22 49	. .	. .	. .				an Süd- und Ostbahnhof . . . . ab	. .	. .	4 57	. .	5 40	. .	23 00	. .

Linie G: Hütteldorf—Gürtel—Heiligenstadt und zurück.

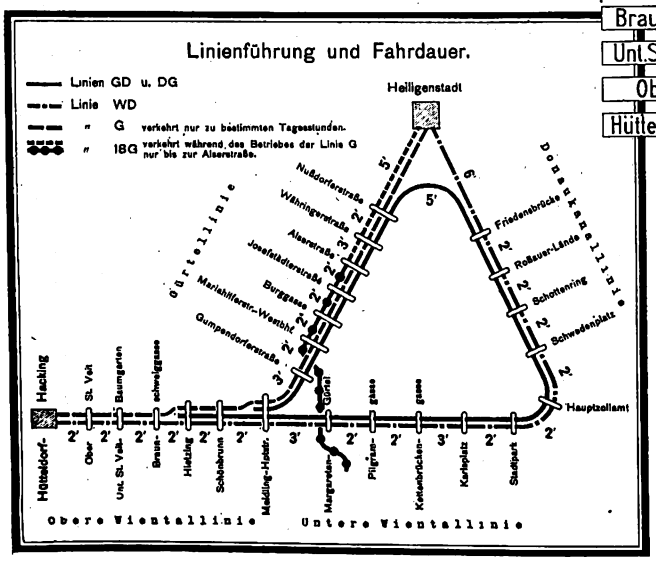
Vormittag: An allen Werktagen . . . ab Hütteldorf von 6 00 bis 8 32; ab Heiligenstadt „ 5 46 „ 8 28

Nachmittag: an Werktagen, ausgenommen Samstag . . . ab Hütteldorf von 16 24 bis 18 56; ab Heiligenstadt „ 16 28 „ 18 52

ALL stations of the Stadtbahn are posted with schedules like this showing the first and last trains of each route at the various stations. The initials "WD," "DG," etc., are route designations.

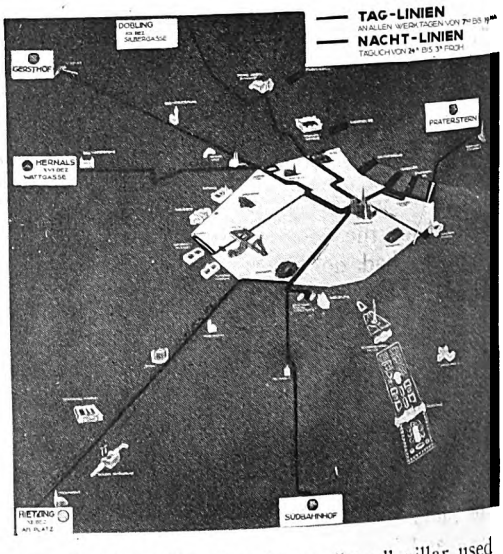


THIS skeletonized layout of Stadtbahn routes is also posted on station walls and in the cars. It shows each route in a separate color or style of line, and gives the running times between stations.



THIS motorbus, now used for short-haul inner-city service, carries its route sign on the sides, in addition to the illuminated route symbols at front and rear.

THE Stadtbahn was converted from a sick steam railway to a healthy electric railway, and is now carrying 110,000,000 passengers a year instead of the 40,000,000 formerly carried by steam. It is a rapid transit system operated as a part of the street railway system with free transfers to the street railways. These transfers are used by some 90 per cent of the Stadtbahn riders. This order-of-stations chart appears in large form on the station walls of the Stadtbahn, and in small form as enameled shields on the car doors.



ON EVERY glazed-type "stop" pillar used for bus traffic, there is painted a map which shows the course of each route in relation to buildings, monuments, parks and other places of special interest. The route symbol and name of terminus are also given.

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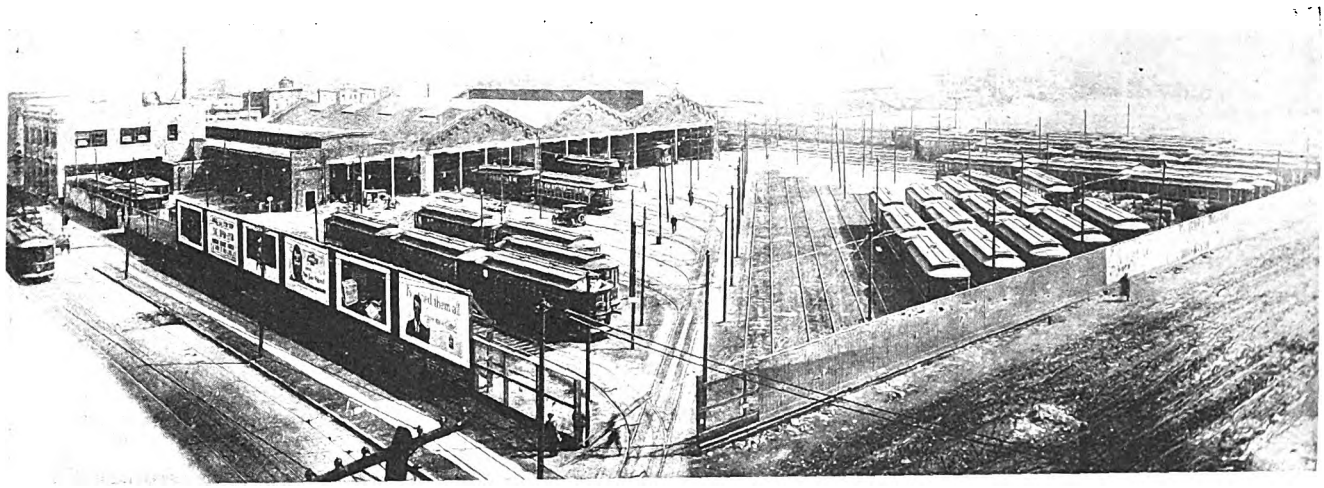

The storage yard with its 24 tracks has a capacity of 183 cars. Three lead-ins and interconnecting tracks give great flexibility in the movement of cars

Brooklyn Car Terminal Enlarged

Many improvements incorporated in the remodeled Canarsie shop and storage yard of the Brooklyn-Manhattan Transit Corporation. New depot with recreation room for the trainmen and ample office space has been added

MODERN in every detail is the recently remodeled Canarsie car terminal of the Brooklyn-Manhattan Transit Corporation. The terminal now has a well-arranged track storage system, a seven-track car repair shop with modern machinery, and a new depot with headquarters for the trainmen and offices for the division superintendent, the depot master, transfer clerk and dispatch clerk. Before the changes were made the shop was inadequate, the storage tracks were not arranged for the most efficient handling of cars, and the trainmen had no recreation rooms. Now the plant is equipped in every respect to accommodate the men and cars of the seven lines which use it.

The new depot, which occupies a corner of the large plot, is a 2½-story structure of fireproof construction. The building has an archway on one side with two tracks which lead from the storage yard to Rockaway Avenue, on the east side of the plot. The starter's office is located on the ground floor, as well as a locker and washroom for the shop employees and toilet rooms for both the shop men and depot forces. A steam heating plant also is located on this floor and space for storing coal.

A stairway from the ground floor entrance on the north side leads to a mezzanine floor, which is used for a locker room and washroom for the car crews. The second floor proper, above the mezzanine, has a large assembly room for the trainmen, a locker and washroom, a partitioned office for the transfer and dispatch clerks, and offices for the division superintendent, the depot master and the stenographic department. The floor has windows on three sides, giving it a pleasant atmosphere.

Large Recreation Room for Trainmen

The assembly room, which occupies more than half of the entire floor, is well equipped for the trainmen. It has three pool tables, checker tables and chairs, and a long counting table, with a double set of compartments for the use of conductors making up their reports. Bulletin boards for announcements of interest to the crews also are located in this room.

The large office for the dispatchers and transfer clerks adjoins the crew room and has windows opening into the crew room, so that conductors and motormen can transact their business without entering the office. The other offices are grouped at one end of the building. The depot master's office is in the corner of the building, overlooking the two streets at the corner of the plot. The division superintendent's office is in the center of the group, and the room for the stenographers and record clerks is in the other corner.

A large number of the lockers are located on this floor. Three hundred lockers are provided in the entire build-

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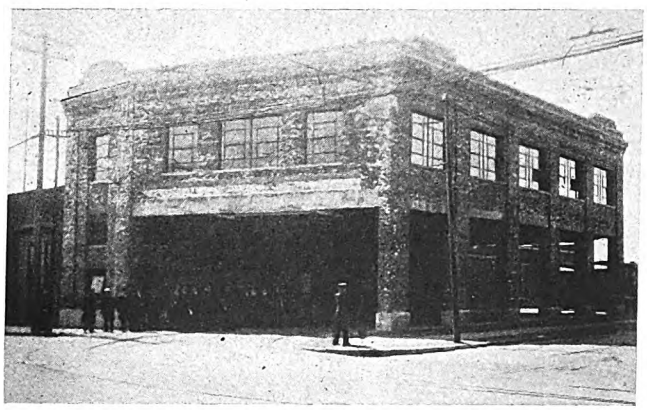
ing, and of this number 298 are being used. The company plans to add 50 more, so that with an increase of men there will be no need for doubling up. In the depot master's office is a case with duplicate keys for each locker and a master key.

Four carhouse bays adjoin the new depot building. These bays formerly were open at both ends and the tracks were joined to the tracks on Rockaway Avenue, on the east side of the building. When remodeled the

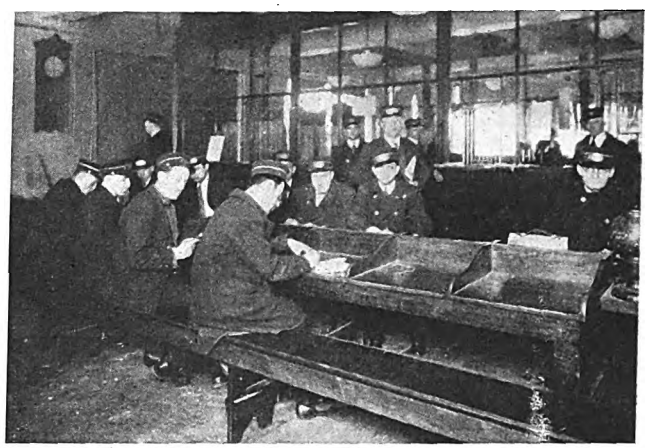


The new depot at the extreme northeast corner of the plot is a 2½-story structure of fireproof construction

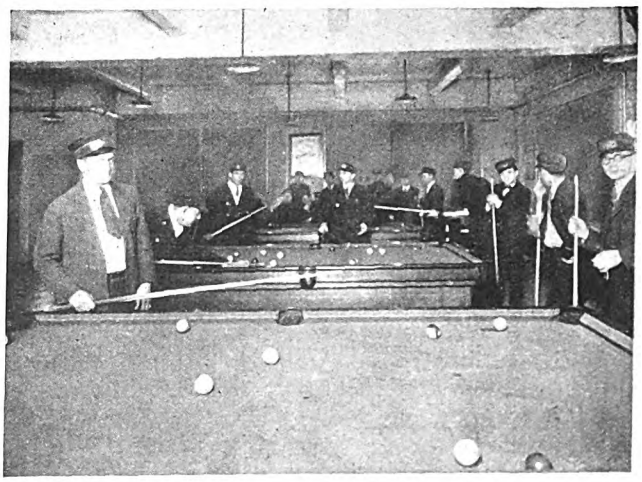
Rockaway ends of the bays were closed and the tracks extending into the street removed. Two of the bays, each having four tracks, are used for storage only.

Bays Well Equipped for Light Repairs

The other two bays, nearest the depot, are used for a car shop. These were enlarged during the reconstruction program and four inspection and repair pits added. The artificial and natural lighting facilities also were improved and several new machines were installed. The second bay from the depot has four tracks, each accommodating three cars and having an inspection pit. These four pits were constructed in the recent program. The pits are used for the schedule inspection of cars as they complete the mileage allowed between inspections, and some 20 to 25 cars go through the inspection daily. All motor and truck repairs are made in this bay, about eight cars being repaired each day. At the rear of the four tracks are located the machine and blacksmith shops,



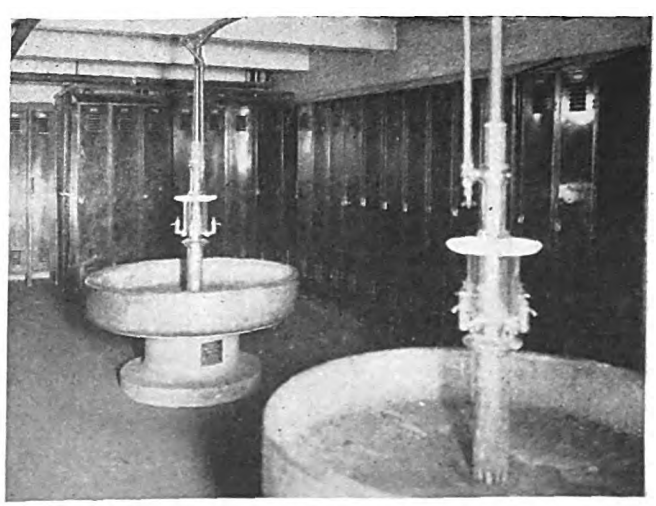
The counting table where the conductors can make up their reports. The office for the dispatchers and transfer clerks may be seen in this view



Pool tables in the recreation room may be used by the trainmen before and after runs

which have all the necessary machines and tools for light repair work. An air compressor in the machine shop supplies air for the various pneumatic tools used in the repair work. Other equipment includes a lathe compressor, drill press, work bench, a forge and two armature racks. An overhead 5-ton crane travels the full width of this bay, so that materials can be transferred

Storeroom at the rear of the car track for working tools and materials



Locker and washroom for the shop employee, showing the large wash fountains

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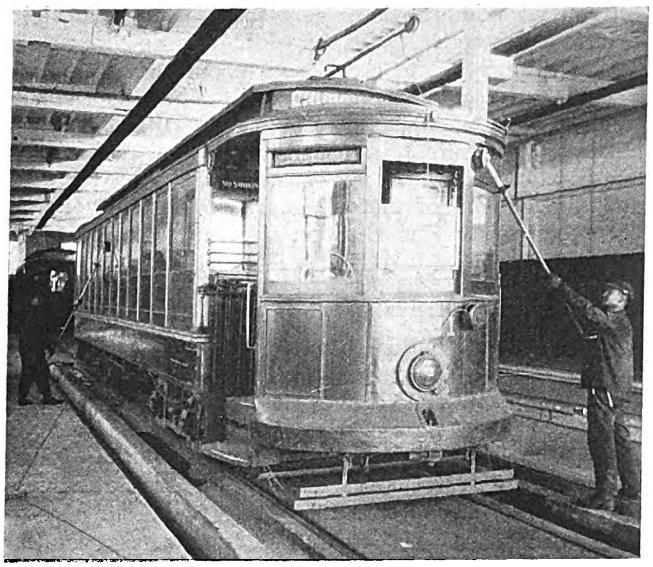

From 30 to 35 cars are washed every night on this car wash rack

side of the rack, extending the full length of a car. The two troughs nearest the track are used for fresh water, while the other two are used as spillways leading to the sewer. Car washers dip their brushes in the clean water and wash the windows and sides of the car. With this arrangement it is possible to wash from 30 to 35 cars each day. Three cars are run into the shop on this track at a time and the one nearest the door is brushed and swept on the interior. It is then moved on to the wash rack which is near the door, and while it is being washed, the second car is cleaned on the inside. The clean car is then moved outside and the second one moved into place on the wash rack. Along a section of the north wall of this bay are numerous racks and bins for the storage of heavy parts. Along the remaining section of this wall there will be a carpenter shop. At the extreme end of the bay is a storeroom where working tools and materials are kept in their individual racks and storage bins. The locker room and washroom for the shop employees are on the ground floor of the depot. The washroom has two large Bradley wash fountains and numerous lockers.

The inspection pits are of concrete and are well lighted and drained

Each of the shop bays is equipped with steel roller doors. These are kept closed during the cold weather, but are easily moved so that no great inconvenience is caused. In remodeling the car shop the roof of the second bay, which was formerly of wood, was removed and skylights erected in their place. The new roof permits the entrance of ample daylight to permit a great deal of the repair work to be done without artificial illumination.

Storage Yard Tracks Arranged for Maximum Flexibility

The storage yard covers an area of 161,000 sq.ft., and has a capacity for 183 cars on its 24 storage tracks. There are three separate track leads to the yard, so that cars can be moved to and out of the yard at any time of the day with no difficulty. The terminal serves seven car lines which requires a maximum amount of flexibility. One lead is to Rockaway Avenue, and passes under the archway of the depot building at the northeast corner of the yard. Another track leads to Rockaway Avenue and leaves the yard at the southeast corner of the plot. The third lead is to Hegeman Avenue and leaves the yard at the northwest corner. The yard tracks all have been reconstructed and most of the floor of the yard has been paved. The lead-in or ladder tracks are so interconnected that it is possible to switch cars from any group of tracks branching from a lead-in to another group. The tracks leading into the inspection pits and storage bays also can be reached from the various lead-in tracks, making the shop accessible for the cars of any line which need repairs.

Anti-Friction Bearings and Special Trial Drives at Vienna

LIKE many other European electric railways, the Vienna Municipal Tramways uses anti-friction journal bearings on a large scale. It now has 100 trail cars with roller bearings in every-day operation. Another 100 trailers have been equipped with a French bearing of conventional design, termed "Isothermos," which is designed to let oil be thrown on the bearings centrifugally with no need for waste or packing.

Experiments are also under way with ten cars having various types of drive. All of these cars have roller-bearing journals, but the drives differ. Two are to be of Cardan type, two of worm design, two of Buchli 1: 9.5 drive with radial axles and body-hung motors, and two more of double reduction gearing run in oil, etc. Two cars will be equipped with the automotive style of levers and disk brakes. The high-speed 1,300 r.p.m. motors to be tried will be of 45 kw. or 60 hp. rating.

In general, these ten cars will be studied from the laboratory and research viewpoint with the idea of applying the knowledge gained to the design of future equipment.

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Commissioners Urge Need for Interstate Bus Regulation

REPORTS and addresses bearing upon a number of important questions of direct interest to utility and local transportation executives occupied the attention of state regulatory officials during the 40th annual convention of the National Association of Railroad and Utility Commissioners, held at New Orleans, La., Nov. 13-16, 1928. These included the questions of interstate bus regulation, the present investigation of public utilities under the Walsh resolution, and the conservation of street and highway space through regulation of commercial vehicles using the streets.

J. P. Barnes, president of the American Electric Railway Association, addressing the commissioners on behalf of the local transportation industry, suggested the need for regulation of taxicabs and other commercial users of the public streets, in order that destructive competition may be eliminated and congested street space conserved. "Commercial use of the public streets must come more and more completely under public control and regulation," said Mr. Barnes. "Already this principle is well defined in the franchise and regulatory restrictions surrounding the commercial operation of street cars and buses. To some degree and in some communities it is recognized in the operation of taxicabs. Not yet has it been extended to the commercial operation of trucks and delivery vehicles. But recent developments in taxicab operation in some centers are tending to demonstrate the necessity of a firm public hand on this commercial use of the city's property in its streets." An abstract of Mr. Barnes' address is printed elsewhere in this issue.

Impatient With Bus Regulation Delay

Considerable impatience with the delay that has been experienced in the attempt to bring about federal legislation for the regulation of interstate bus operation, was expressed in the discussion of the report of the special committee on motor vehicle legislation presented by John E. Benton, chairman, general solicitor of the association. An entire evening session was devoted to the discussion of the report and to addresses bearing on the motor vehicle question by representatives of several interested groups. These included Ivan Bowen, former Minnesota commissioner, counsel for Motor Transit Management Company, H. L. Brown, general counsel National Automobile Chamber of Commerce, and S. A. Markel, chairman legislative committee American Automobile Association. Mr. Bowen held that regulation should not extend much beyond the requirement of a certificate of convenience and necessity. In his address, which is abstracted elsewhere in this issue, he also questioned the practicability of the attempt to delegate regulation of interstate carriers to the state commissions through the machinery of the Parker bill.

Mr. Markel outlined the attitude of the Bus Division of the American Automobile Association and expressed the hope that a reasonable bill for the regulation of interstate buses could be passed by Congress promptly. He said that conferences have been held recently with the several groups interested in this subject and that a modified bill embodying an attempt to eliminate some of the objections raised against the Parker bill had been drafted for purposes of discussion. Speaking for the operators of motor buses, Mr. Markel said: "We are extremely anxious to have a reasonable bill enacted by Congress promptly. We are willing, if no violence is done to principles, to accommodate our views to those of our conferees wherever possible. The Bus Division has not acted upon the proposed draft of a bill which has recently been prepared. In my opinion, however, any practical bill which would permit the orderly growth and development of motor bus transportation would be agreeable to the Bus Division if it met with your approval."

Mr. Brown Explains N.A.C.C. Position

Charged with broken faith on the part of representatives of the National Automobile Chamber of Commerce in opposing the Parker bill at the hearings before a committee of Congress, Mr. Brown explained that he considered the machinery of the Parker bill to be inadequate and unworkable. He said there is no disagreement by any group on the need for certificates of convenience and necessity for interstate bus operation. He suggested further that there seems to be general agreement that it is desirable to utilize the experience and knowledge of state regulatory commissions in the granting and control of certificates. To accomplish this, while at the same time overcoming the objections to the machinery of the Parker bill, Mr. Brown suggested that applications for certificates for interstate operations be made directly to the Interstate Commerce Commission and referred automatically for hearings and reports, to boards made up of one representative from each state affected by the application, selected by the Public Utilities Commission or whatever other board may in each state be charged with the regulation of intrastate commerce.

Commissioner J. S. Benn of Pennsylvania again repeated charges of bad faith directed against representatives of the N.A.C.C., which he had made preceding Mr. Bowen's address. He took exception also to the inference in Mr. Bowen's address that state commissions in either state regulation or proposed national regulation of buses have approached the matter of determining public convenience and necessity from the standpoint of protecting the railroads, existing bus lines or other forms of transportation.

Referring specifically to the effort to obtain national legislation for the regulation of interstate buses, Commissioner Benn said that there has been a process of whittling down the scope and authority of the state commissions in proposed legislation to the point where little is left. He charged that the National Automobile Chamber of Commerce had broken a gentlemen's agreement to support proposed legislation before Congress, provided certain railway groups agreed to eliminate the provision for the regulation of trucks as well as buses in the proposed bill.

After considerable further discussion of this subject, the commissioners voted to continue their committee on motor bus legislation, with power to act in co-operation with the committee on state and federal legislation. The committee was instructed to work for adoption in any law which is passed, of the principles of the Parker bill with such minor modifications in machinery as may seem desirable.

Report Made on Walsh Resolution

First vice-president L. E. Gettle, chairman of the special committee on the Walsh resolution for the investigation of public utilities, presented a report outlining the reasons for the formation of this committee and the steps

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taken regarding this investigation. In making this report Mr. Gettle strongly condemned the suggestion by members of the U. S. Senate tending to impute the motives of himself and members of his committee in appearing before the Senate interstate commerce committee in the hearings on Senate Resolution 83, introduced by Senator Walsh of Montana.

Louis E. Gettle, chairman of the Wisconsin Railroad Commission, was elected president for the ensuing year. Charles Webster of Iowa was elected first vice-president, and A. J. Maxwell, North Carolina, second vice-president. Glacier Park, Montana, was selected as the location for the next meeting, which will be held beginning Aug. 27, 1929.

Wider Regulation of Commercial Vehicles Needed

Opinions expressed at New Orleans meeting that the use of the streets is a matter of public concern and should be under public control

By J. P. Barnes

President American Electric Railway Association

THE local transportation industry has learned that its right of survival is based not on an investment made or a plant constructed, but on a service rendered. We have learned that by our service we shall be judged and by the measure of its usefulness shall we be rewarded. With our acceptance of new types of vehicles has come the adoption of a new philosophy that the street car must and shall be used where and only where it best suits the needs of mass transportation; that the bus, large or small, shall by the same test be assigned its proper place in our operations; that we will not fear that which is new either in vehicle or method. We have cast our problem in terms of transporting comfortably the largest number of people at the smallest cost and we have refined and perfected the efficiency of these operations. We have insisted that as our vehicles serve the largest groups of travelers they should have, to a degree, preferential use of the streets. In this our insistence has been greater than our accomplishment, for today the individual vehicle moving and standing throws so heavy a burden upon the traffic arteries of our city that all movement is impeded. Imagine a railroad using two of its four tracks for a storage of cars while the other two were so crowded as to reduce operation to half speed or less, and you have the prototype of conditions in the present city street.

Along with this crowding of arteries has grown quietly and to a degree unrecognized a further taxing of horizontal facilities through the tremendous development of vertical transportation, which has brought about great concentrations of population in high buildings without corresponding enlargement of traffic facilities to and from their locations.

Our problem has grown from its initial dimensions of mere carrying of groups of people with speed, safety and convenience. By the addition and multiplication of individual vehicles and the population concentrations it has expanded to the point of developing a new limiting feature, namely, street capacity, and has become the problem of the community. To sustain community activity a free circulation of traffic from part to part is as essential as is free circulation of blood in the body. Already, due largely if not wholly to the difficulties of traffic, branch stores, branch banks and neighborhood shopping centers, are everywhere developing. It may or may not be that this decentralization is a step forward even though difficulties and complexities of administration be increased and inventories multiplied. What is important is that these developments are taking place not as a result of economic study and sound merchandising, but mainly because of the sheer physical difficulty of getting from place to place in a busy American city. Far be it from a street railway man to decry or discourage the tendency to move about, but if the combination of this tendency with inadequate physical facilities for its indulgence is already affecting the habits of communities, then it is time that all agencies socially or economically concerned with those habits, pause to take stock.

Too many traffic engineering studies result only in recommendations for mere temporary relief. Too many city plans reflect the architectural or landscaping genesis of the planner. There must be profound fundamental study and understanding of all the elements and influences that affect the growth and habits of communities. It is a fundamental and general problem and will yield only to the co-operative effort of all interested groups. There is no place for individual or class selfishness in developing the movement which is the life of the modern community, but there is abundant place for a service of high order.

The transportation problem of a modern city involves and includes all of its transportation. The city's transportation plant includes every vehicle and every public way in the city. The load factor on this plant is highly irregular and at times parts of it are grievously overloaded. At the points of greatest overload the least adequate of the facilities are the streets themselves and their inadequacy is frequently exaggerated by their partial use for storage purposes. Multiplication of vehicles in the future, as in the past, cannot but aggravate an already burdensome condition. Relief lies not in the addition of vehicles to the city's transportation equipment.

The use of the streets is a matter of public concern and is, of course, under public control. Commercial use of the public streets must come more and more completely under public control and regulation. Already this principle is well defined in the franchise and regulatory restrictions surrounding the commercial operation of street cars and buses. To some degree and in some communities it is recognized in the operation of taxicabs.

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Not yet has it been extended to the commercial operation of trucks and delivery vehicles.

Recent developments in taxicab operations in some centers are tending to demonstrate the necessity of a firm public hand on this commercial use of the city's property in its streets. There are two plans of taxicab exploitation in operation, different in detail but alike in that each tends to wipe out by destructive competition that adequate and acceptable service which every modern city requires.

Under one plan the manufacturer encourages some operator to extend his fleet until his cash and credit resources are completely embarked in the operation. The same or another manufacturer then points to the operator's success and enlists some competitor operator in a similar enterprise with the result that more service is offered than necessary. Usually a price war develops in the course of which both operators become so hard pressed that service and maintenance alike deteriorate. One or both of the operators may fail, which is an individual chance and an individual misfortune. The important thing is that in the process of elimination the service has failed and the city has been deprived perhaps for a considerable time of that adequate service it desires and which it could have if it controlled the use of its own streets in its own interest.

The other plan, which is spreading rapidly, is for the operator to purchase a fleet of cheap cars which he rents by the day to individual drivers. The owner of the cars receives a fixed rental from the driver and is consequently not interested in the gross earnings of the cab. Consequently the venture is usually inaugurated with some such ridiculously low rates as two or three miles for a quarter. Novelty produces enough initial business to encourage expansion to such degree that, as in the other case, the city is over-cabbed and the elimination process works out with precisely the same effect upon the public service.

Competition may be the life of trade, but regulation is the life of public service. Destructive competition is no longer permitted in the field of the established public utilities, but in how many new directions must the community apply the proven principles of regulation in the future? Obviously in all which threaten a breakdown or a dangerous overload of the basis transportation facility—the streets. Only by the application of regulatory practice can the public protect itself from the hazards of useless duplication and destructive competition.

In the course of study of such things as these, it has been vividly impressed upon our industry that new times have brought new problems and that new methods must be devised to meet them. The American Electric Railway Association has visualized the problem of its industry as one of public transportation, not merely of street car operation. We have made a start and are rapidly broadening our activities to include studies of the fundamental problems of modern public transportation. We have turned our backs upon the superficial expediencies which have served as temporary solutions in the past and we are looking forward to solutions based on correct application of sound fundamentals. We are studying the economics of our industry, not from the narrow viewpoint of past methods and present equipment, but in search of the way by which we may render the maximum of public transportation service in every direction and with every available means. There is a place in the modern community for general co-ordination of public transportation services. That place we mean to determine to define and, if we may properly do so, to occupy it as well.

Our committees are seeking to define the economic foundations of street traffic, of fare structure, and of public transportation co-ordination. The expansion and adaptation of our service must be based upon these fundamentals and so based will not fail to merit and receive the rewards of public approval. Only by continuing to render a useful public service can we establish our right of survival, and only by increasing our service can we keep abreast of a rapid development which is taking place about us.

Have You Received Your Copy of Instructions and Rules for the Contest?

AN ATTRACTIVE folder giving full information and suggestions for preparing items for submission in ELECTRIC RAILWAY JOURNAL'S Maintenance Contest has been sent to electric railway officials and department heads. Additional copies for posting on bulletin boards or distribution among maintenance men are available. Let us know your requirements.

Material entered in the new contest is coming in with each mail. The sooner you get started the greater opportunity you will have of winning one of the valuable prizes. Don't delay in getting started. There is no limit to the number of items that may be sent in by one person. The more you submit the better chance you have of winning one or more of the big prizes. Some companies are organizing all maintenance departments to go after the award. Look up the announcement in the Oct. 20 issue of the JOURNAL or send for copies of the instruction folder.

The main individual prize of $200 will be awarded at next year's annual convention to the person submitting the best maintenance idea during the contest. There are twelve $25 departmental prizes to be awarded to individuals sending in winning maintenance ideas. These will be divided equally between the following four maintenance divisions:

1. Rolling stock and shops.
2. Way and structures.
3. Electrical and line.
4. Buses and garage including shop equipment for bus maintenance.

An attractive trophy will go to the company making the greatest contribution to improved maintenance through participation in the contest and special certificates of merit will be awarded to each department making the best individual showing. Each item published will be paid $5 for regardless whether it wins a prize or not. Read over the instructions and conditions and send in your material.

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Bus Regulation Should Not Be Restrictive

In these views presented at New Orleans it is held that effective federal regulation of interstate operations requires little more than the issuance of certificates of convenience and necessity

By Ivan Bowen
Counsel for Motor Transit Management Company

SINCE the beginning of the current year, the first regularly scheduled motor bus service has been put into operation between Chicago and New York. Now there are at least four separate lines with regular service between the two points, each operating several schedules daily. There are two lines, which either directly or by traffic interchange carry passengers between the Pacific and Atlantic Coast on regular schedules. As to a considerable portion of their route, both of these lines operate only interstate, being prohibited from carrying passengers between points within states. When motor carriers successfully carry on such business, the question whether the service is convenient and necessary and demanded by the public has been answered in the affirmative. The number of passengers carried runs into the millions per year and one of these carriers has operated as high as 2,000,000 bus-miles per month in the past six months.

Federal Regulation Needed

Necessity for federal legislation to regulate the passenger-carrying motor vehicle in the interstate field has for a number of years been recognized. There has been, it is true, some difference of opinion as to the form the regulatory measure shall take; but among the representatives of the passenger motor carrier there has been no protest raised to the efforts to induce Congress to act. On the contrary the bus division of the American Automobile Association has consistently labored to co-ordinate the views of the various groups which have from time to time met in conference.

What then is the extent of the necessity for legislation today, it being admitted that legislation is necessary? Federal legislation should certainly go no further than the necessities of the situation warrant; and the requirement of a certificate of convenience and necessity for interstate operation would appear to be the extreme. Bond and insurance protection of the public as a matter of course, follow. Nothing has occurred in my opinion that requires legislation beyond that minimum. Ralph Budd, president of the Great Northern Railway, and whose company through a subsidiary operates one of the largest intrastate motor carriers in Minnesota, said at a meeting in New York this past year:

"The requirement of a certificate of necessity and convenience for interstate operation really seems to be the only pressing necessity for federal legislation."

This undoubtedly was his conclusion as a railroad man, for the Northland company has practically no interstate mileage and is so situated that interstate competition does not affect it.

The best test as to the necessity for specific legislative regulation aside from the need for certificate of convenience and necessity, is probably a determination of the object to be accomplished. The Parker bill covers two additional requirements: rates and schedules.

It will be admitted that both of these are matters of public interest requiring specific regulation if their control is not adequately governed through the hand of the government on the throttle of the regulatory machine—the certificate. It is granted that the authority to issue a certificate embodies the authority to revoke it for cause. Take, then, the question of rates. The passenger motor carrier is the "One and only in captivity"—a public utility where regulatory legislation has been to a considerable extent directed toward restricting it from underselling its established competitor in the commodity offered —transportation.

There then is but slight probability of a present demand for lowering of its service charges—the nature of its competition with the rail carrier will take care of that. It can deliver its form of transportation at a cost not to be met by the rail carrier. Also the private automobile is the leveller of its rates. The industry looks to its natural competitor on the highway—the private car owner—for increase in patronage. To draw this trade the motor bus must convince of its comfort, service and economy.

But assume that the restriction of the field to a single motor carrier on a route might give cause for concern in the matter of excess charges to the public. In addition to these competitive rate regulators, the governor on the operator is the franchise under which he is permitted on the highway. By one gesture toward revocation of this franchise, the regulatory power has the culprit crying for the opportunity to demonstrate his ability to continue in the field. This is no idle figure of speech—control over the certificate is the power to destroy. Furthermore, the mere whisper on the part of the issuing authority that public convenience and necessity were not being served would bring applications for the right to compete on the same route without number. No operator in the field would dare to permit evidence to accumulate that public convenience and necessity were not being reasonably served.

This same club is suspended over the head of the certificate holder in the matter of service. Section 10(b) of the Parker bill was drawn with such warning in mind. It provides:

"That where additional service is necessary or required, the board or commission shall give to the existing motor carrier a reasonable time to furnish said service, etc."

Now on the other hand, what of the necessity for the protection of the rail carrier from competition? If it be conceded that there is "convenience and necessity" for common carrier motor transportation service, then the only thing that should govern the charge for the service

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is its cost and not its effect on other forms of transportation. A "form of transportation" may be a regulated monopoly entitled to protection from its kind, but "transportation" in and of itself is not and cannot be a monopoly, any more than "light," "heat" or "power."

We are confronted then with the controversial section five of the Parker bill. Controversial because of the conflict of interest between the agencies on the one hand believing that economic transportation can best be produced by confining the field to the one form, and on the other, this new servant of commerce forcing its economic advantages upon the public in the face of restraint.

There is no other instance in the history of transportation where the beckoning hand of legislative welcome did not invite development — "legislative welcome" because the welcome of the public has been an ovation.

Water, rail and air transportation have each been heralded as forerunners of a greater civilization. And yet it is proposed that the extension of the benefits of the motor carrier—a mode of travel that has revolutionized the world and made the average citizen a master of distance—be made to depend upon the effect it may have upon other forms of transportation, instead of solely upon the benefits to the public. The public is entitled to have written into the law relating to highway transportation, a like declaration of policy as that prescribed for the water and rail agencies, to wit:

> It is hereby declared to be the policy of Congress to promote, encourage and develop highway transportation, service and facilities in connection with the commerce of the United States, and to foster and preserve the same in full vigor.

This was recognized in the report of the Interstate Commerce Commission in Docket No. 18,300:

> The public interest and national welfare are fundamental in legislation affecting transportation, and in the administration of regulatory law. Where there is conflict between public interest and private interest, the former is paramount and the latter must give way.
>
> Railroads have no more economic right to any traffic than had the canals and stage coaches which opposed the constructions of railroads on the ground that they would take traffic already being carried on the canals and highways.

In consideration of the Parker bill before the House Committee on Interstate and Foreign Commerce, there developed a difference of opinion as to the workability of the administrative machinery proposed. Some doubt was voiced as to the constitutionality of delegating authority to issue certificates to the state commissions. The constitutionality question can well be left with Congress in the first instance. What we are all interested in, is the practicability of administration and the preservation of the existing authority in the states.

No state can, nor should, attempt to exercise control over strictly interstate commerce. That is a matter that the constitution lodges in the federal government. The state is interested, however, in the physical operation of the transportation agency within its own borders. A regulatory law should be designed to preserve these prerogatives which the decisions of the courts have determined belong to the state in the absence of federal legislation. This may seem a contradictory proposal, but an examination of the opinions of the Supreme Court in the highway transportation field will disclose the line of demarcation, and indicate that the state jurisdiction is best preserved by confining federal legislation to the narrowest possible limits.

What then is the simplest machinery for certificating operators in interstate commerce? The Parker bill lodges the power in the state boards, or joint state boards. The situation existing in the motor carrier field is not the same today as existed when such administrative machinery was first proposed. Then the transportation of interstate passengers was largely across one state line and at the most two. Today single motor carriers operate through lines from the Pacific to the Atlantic, and from the Lakes to the Gulf. The cumbersomeness of a joint body representing all states exercising administrative duties on applications from coast to coast is apparent.

Application to extend a certificate which has been granted through half a dozen or more states to another state involves the question of interstate commerce in all of them. Are they all to participate in the joint board on such an application? That would be their right and the right of the applicant to have them. The state commission in such a proceeding is called upon to regulate interstate commerce, acting for the country as a whole, while as a representative of the state its interest primarily is confined to the physical operation of the carrier over the state's highways. In attempting by such machinery to preserve to the states the jurisdiction that rightfully belongs to them, they are having thrust upon them control over commerce which constitutionally is lodged in the federal government.

The Interstate Commerce Commission, pursuant to the authority given under paragraph 3 of section 13 of the transportation act of 1920, has adopted rules and regulations under which joint hearings are conducted. The authority given to the states in that enactment may not be adequate to meet the demands of the situations in the highway transportation field, but the basic principle for co-ordination of the regulatory machinery of the federal and state governments is there. It should be expanded. Let legislation clarify the compulsitory clause as to holding joint hearings, let it give to the state representatives sitting in such hearings the dignity of participating in the determinations, but recognize that control of interstate commerce is a federal prerogative and that police control of the highways belongs to the states.

State Regulation Under Its Police Power

The Supreme Court of the United States has already confirmed in the states numerous regulatory powers over interstate carriers in the absence of federal legislation. Any law passed by Congress should be designed to protect and preserve these constitutional prerogatives of the state. The following principles have been established:

1. Registration of motor vehicles. (Hendrick vs. Maryland, 235 U. S. 610.)
2. Payment of state tax, graduated according to the number and capacity of the vehicles operated. (Clark vs. Commission of Ohio, U. S. Sup. Ct., May 31, 1927.)
3. The interstate carrier is subject to regulation of the state imposed to prevent injury and damage to the highways. (Morris vs. Duby, 47 U. S. Sup. Ct. Rep. 548.)
4. A state may require a certificate of a carrier to carry both interstate and intrastate passengers. (Cannon Ball Transportation Co. vs. P. U. Comm., U. S. Sup. Ct., Interstate Busses Corp. vs. Holyoke St. Ry. Co., U. S. Sup. Ct.)
5. A state may require a non-resident operator to appoint an official of the state for service of process. (Hess vs. Pawloski, 47 U. S. Ct. Rep. 632.)
6. The state may impose upon vehicles using the highways exclusively in interstate commerce nondescriminatory regulation for the purpose of insuring the public safety and convenience; and that a license fee no larger in amount than is reasonably required to defray the expense of administering the regulation may be demanded. (Sprout vs. City of South Bend.)
7. A state may require users of interstate vehicles on the highways to file contracts providing adequate insurance for the payment of judgments recovered for injuries, if limited to damages suffered within the state, by persons other than passengers. (Sprout vs. City of South Bend.)
8. A purely interstate carrier cannot by subterfuge carry on intrastate business. The destination of the passenger when he begins his journey and known to the carrier determines the character of the commerce. (Sprout vs. City of South Bend.)

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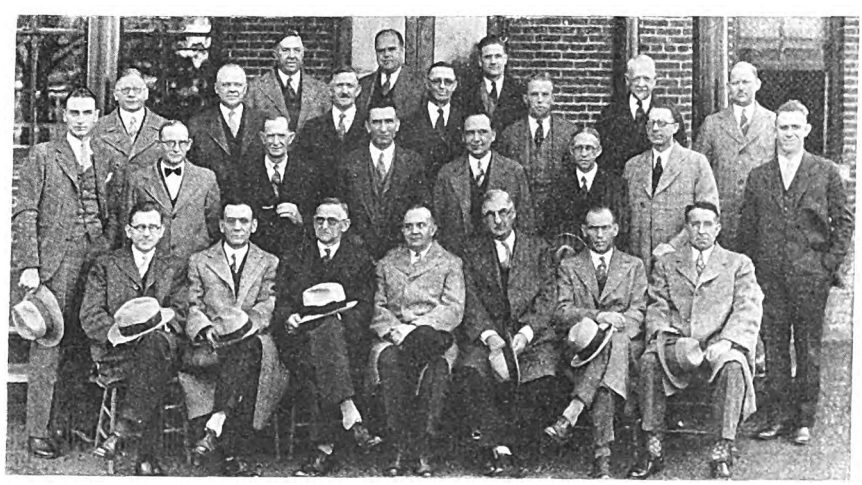
9. A state may impose upon vehicles engaged exclusively in interstate commerce a reasonable charge as their fair contribution to the cost of constructing and maintaining the public highways. (Sprout vs. City of South Bend.)

It is the common "misunderstanding" that motor buses are using the highways without contributing to their cost or upkeep. Such, of course, is not the fact. Motor buses pay a tax for the use of the highway proportionately in excess of that levied on any other vehicles.

It is a common complaint that motor buses are taxing the capacity of the highways. When an analysis will show that on heavily traveled routes motor buses are in the proportion of one to several thousand other vehicles, that claim is disclosed to be without foundation. Motor buses have made available the use of highways to millions who otherwise would be deprived to a large extent of their benefits. The citizen who does not own an automobile, or who for financial reasons cannot afford to make extensive use of it if he has one, is as much entitled to the pleasure of highway travel as his more opulent neighbor. The car owner who occupies the highway with a vehicle accommodating one or two passengers is not in a position to denounce the user of a vehicle which carries thirty or forty passengers. Bus travel, as a matter of fact, results in economy both of the highways and to the passengers. That is the idea the motor carrier is now engaged in selling.

Middle Atlantic Equipment Men Discuss New Cars

WITH the spirit that the mechanical department of electric railways should set the pace for other departments to follow, about 30 men of the Association of Electric Railway Equipment Men, Middle Atlantic States, met and discussed various maintenance problems at Hampton, Va., on Nov. 14.



Middle Atlantic Equipment men attending the Hampton, Va., meeting

In his opening remarks A. T. Clarke, president of the association, spoke about things that should be incorporated in new cars. Later in the meeting D. E. Frame, master mechanic Delaware Electric Power Company, Wilmington, Del., described interesting details of the new Wilmington cars, which were exhibited at the Cleveland convention and described in ELECTRIC RAILWAY JOURNAL for Sept. 22, 1928. These cars weigh 36,840 lb. without passenger load, are 42 ft. long and seat 44 passengers. They are equipped with four 35-hp. motors. In service average acceleration rates of 3½ m.p.h.p.s. are obtained. In the design of these cars comfort of passengers was given first consideration. The cars have been made as light as possible without sacrificing durability. Particular attention was given to the heating and lighting equipment. Large windows, Flexolith floors and thermostatic control of heaters are features. Variable load brakes give uniform braking with loads of from five to 125 passengers. Drop platforms make necessary only a single step from the street to the inside of the cars, the second pair of steps being made by the passenger after his fare is paid. The units are attracting increased patronage so that they earn more per car-mile than other cars of the company.

Mr. Frame also told of some remodeling which his company is doing to arrange present cars for one-man operation. He expressed the belief that in remodeling cars for city service a maximum weight of 40,000 lb. should be the limit. Cars heavier than that should be considered obsolete.

The dragging of brakeshoes was brought up in the discussion of equipment troubles. The general opinion was that it is better to provide a clearance of about ⅛ in. than to run danger of tight brakes and that piston travel of from 5 in. to 5½ in. could be used successfully. Need for a more satisfactory type of dustguard for journal boxes than is commonly used was considered desirable. The dustguards used in Baltimore were described by Mr. Clarke. These are made of leather and the holes are ⅛ in. less in diameter that the axles over which they fit.

Radio interference from the equipment man's standpoint was discussed. Experience with the new type of General Electric choke coils was mentioned. Other causes for interference that were discussed included arcing at trolley wheels, cutting in and out of compression governors, faulty bonding, sand on the track, inaccuracy in line, electric signals and electric track switches.

There was considerable discussion upon various types of window wipers now used on electric cars. The general feeling of those present was that a more satisfactory device for this purpose than those that are now available is desirable.

Officials of the Virginia Public Service Company acted as hosts at a dinner given to the members of the association at the Hampton Golf and Country Club. An inspection was also made of experimental work being done at Langley Flying Field, and later an inspection was made of the railway company's shops at Hampton. The next meeting of the association will be held at Wilmington, Del., on May 15, 1929.

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MAINTENANCE HELPS That Have Proved

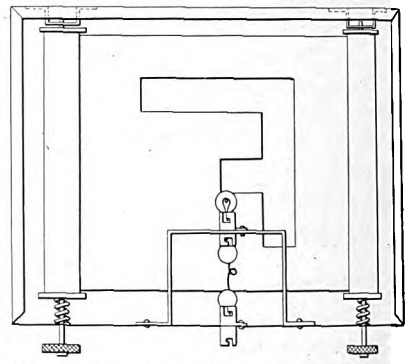
Cars Improved for One-Man Operation Please Patrons*

By C. B. Hall
Chief Clerk Mechanical Department Virginia Electric & Power Company, Norfolk, Va.

CAR remodeling for one-man operation by the Virginia Electric & Power Company, Norfolk, Va., is going forward with marked success. Seventeen cars have been completed so far and placed into regular service. Many favorable comments from pleased patrons have been received. The accompanying illustration shows the interior of the old and remodeled cars.

While the remodeling was undertaken primarily to facilitate one-man operation advantage was taken to introduce numerous improvements. These include such items as new style ventilators, safety-dome type lighting fixtures, sanitary handstraps, side window guards, genuine buffed leather spring cushion seats with aluminum grab handles, rubber tile flooring of block design with brass seam binding, cylinder cross-seat heaters, Staffless brakes, rotary foot gongs, new destination sign curtains and mechanisms carrying 4-in. lettering, door pull plates, operator's window cleaners, wrought steel trap door lifts and special motorman's seats of spring cushion type with padded backs and with cuspidor castings. The numerous changes appeal to the riders much more than the old arrangement with rattan seats.

An appreciable increase in revenue has resulted from the use of these cars in service. Some of the improvements which facilitate passenger movement and so speed up schedules by reducing stops include pneumatic front and rear treadle doors, air brakes and safety car control equipment, Westinghouse type K-75-A controllers with magnetic line switches and knockout cylinders, new side and head lining with Pantasote window curtains. All heater wiring is housed in ½-in. black enameled conduit pipe.



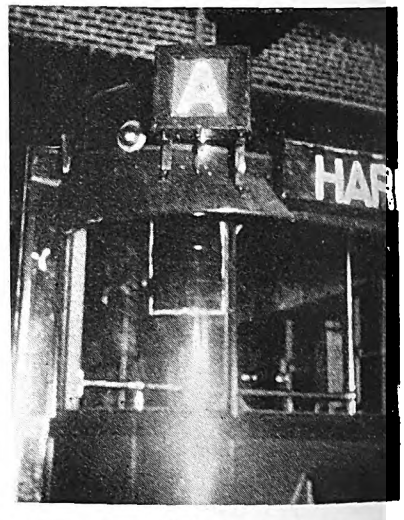
Destination sign arrangement used by the San Diego Electric Railway

Geared Control Removed from Destination Sign Boxes*

By Farrell Tipton
Electrician San Diego Electric Railway, San Diego, Cal.

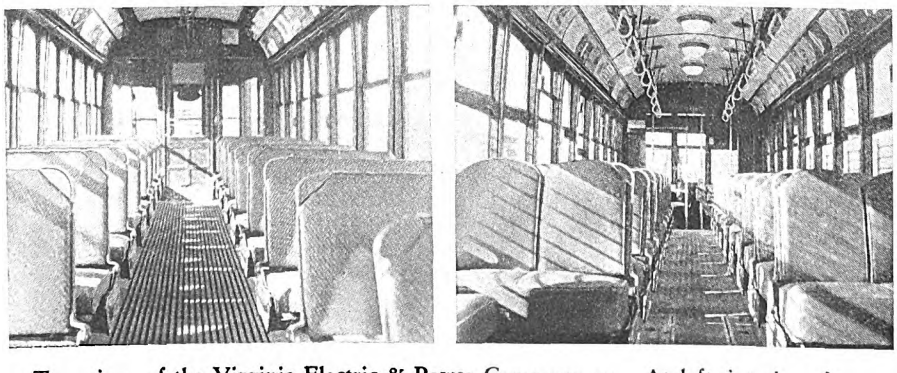
SEVERAL of the cars operated by the San Diego Electric Railway, San Diego, Cal., came from the factory equipped with a destination sign which was controlled from inside the car. This had an index finger to show the number. Due to wear and lost motion in the gear control it became necessary for the operator to inspect the sign box from the outside of the car in order to see that the sign registered properly, as the index finger did not always show the true position. To eliminate the difficulty without great expense, the geared control was removed and other provisions made for operating the sign.

The accompanying illustrations show the arrangement of the box. It is made of sheet metal, except the front, which is a wooden frame to hold the glass. The back is also of sheet metal and is fastened permanently to the body by brackets. The top and two sides at the back of the box have flanges which slide over and hold it to the back. At the end of each shaft a metal disk is fitted to turn the rollers as desired. A coil spring around each shaft between the bottom of the box and the roller keeps tension on the curtain. Each roller is keyed solidly to the shaft. A bracket is mounted in the center of the box to provide the desired height for the lamps. Two automobile headlight receptacles are used.



Appearance of destination sign on one of the cars

*Submitted in Electric Railway Journal Prize Contest.



Two views of the Virginia Electric & Power Company car. At left, interior of car before remodeling. At right, one of the new remodeled cars

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Valuable

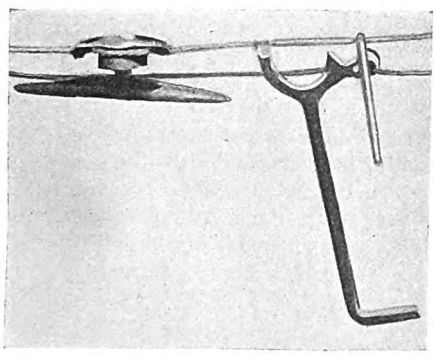
Tool for Placing Hangers on Span Wire*

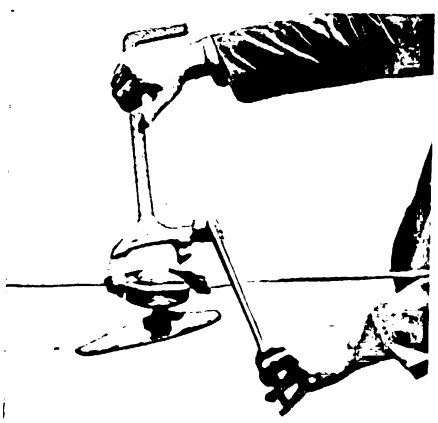
By Thomas O. Smith
Superintendent of Overhead Charleston Interurban Railroad, Charleston, W. Va.

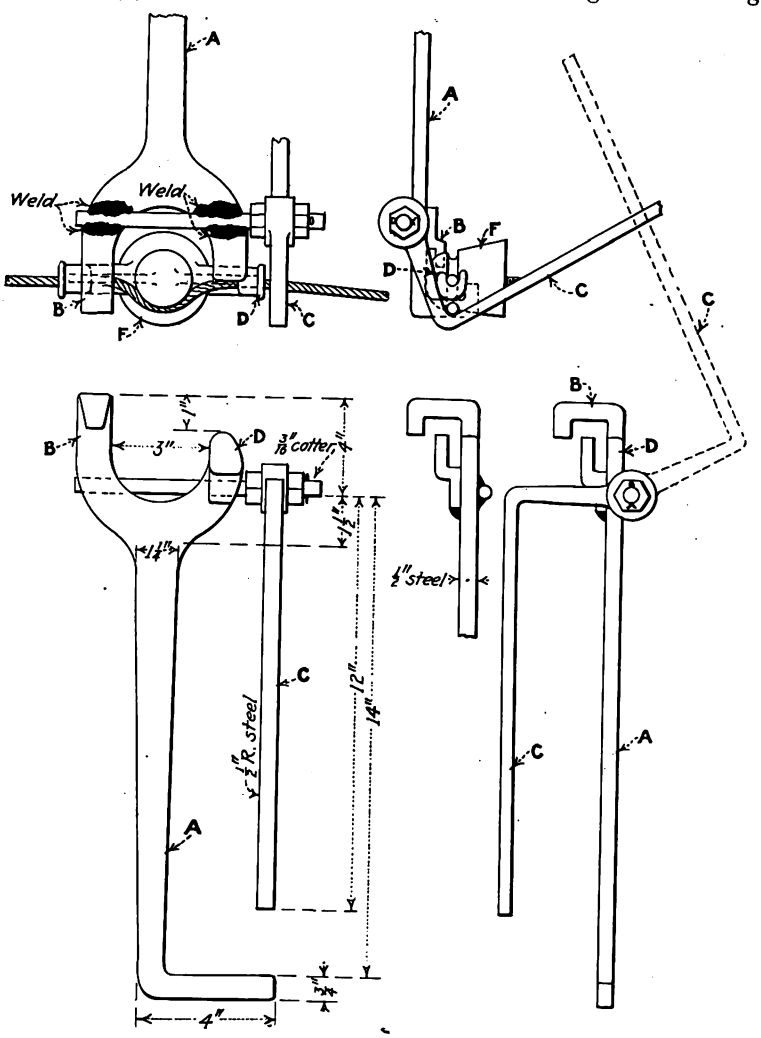
PLACING span wire insulators on messenger wire or other spans was made a one-man job through the use of a tool constructed in the shops of the Charleston Interurban Railroad, Charleston, W. Va. With this, hangers can be installed by one man at the rate of 100 per eight-hour day. The tool, as shown in the accompanying illustrations, consists of a center clip with two handles shaped so as to hold the hanger and at the same time pull the span wire tight.

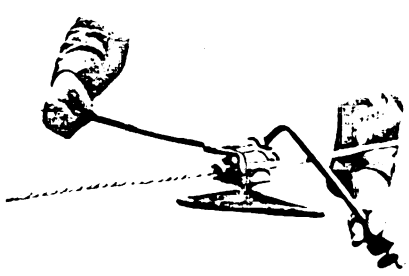
The method of installing a hanger consists of placing the hanger marked *F* in the accompanying line drawing, into the clip *B* while the right hand of the workman holds the handle *A*. The handle *C* of the tool is then placed over the span wire and is drawn closed. This pulls the span wire under the lug *D* on the hanger *F*.

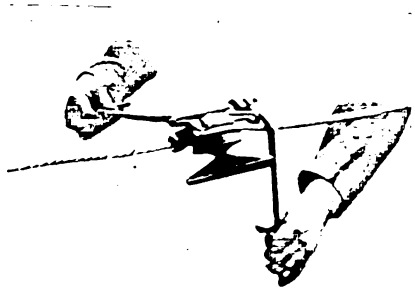
**Submitted in* Electric Railway Journal *Prize Contest.*











Various stages in the operation of the special tool for placing span hangers on span wire

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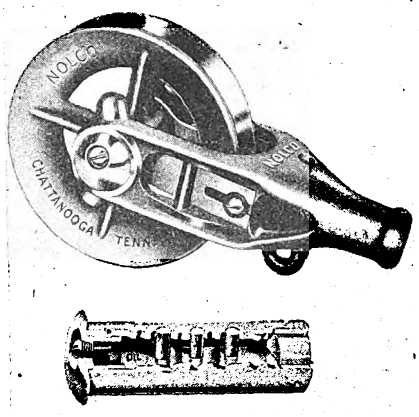
NEW EQUIPMENT for Better Maintenance

Self-Oiling Type of Trolley Harp and Wheel

OIL IS carried in a hardened and ground 1⅛-in. steel axle in the "Nolco" self-oiling non-arcing trolley harp, offered to the industry by the National Oil Lubricating Company, Chattanooga, Tenn. The axle has a reservoir which is filled with oil and this is lifted to the axle bearing surface by three ¼-in. specially treated wood plugs by capillary action. To refill the reservoir a ¼-in. pipe plug is removed from the large end of the axle.

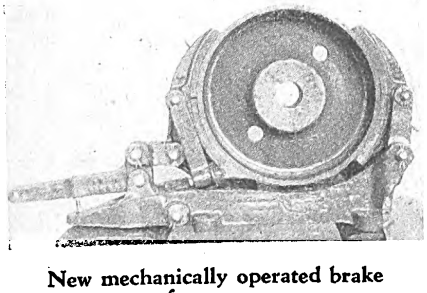


At top, assembled harp and wheel. At bottom, construction of steel axle with oil reservoir

Trolley wheels supplied are made of an alloy of 91 per cent Lake copper, 7 per cent straight tin and 2 per cent horse-head zinc all soft enough to insure minimum wear on the trolley wire, but strong and tough. The harp is made of gun-metal bronze.

Improved Brake for Cranes

FOR THE bridge drives of electric traveling cranes, lift bridges, electric hoists and other applications requiring foot-operated or hand-lever operated brakes the Electric Controller & Manufacturing Company, Cleveland, Ohio, has brought out an improved type of brake. This is known as type WB, mechanically operated. It is of the shoe type with improved brake and friction linings. The shoes are of unusually thick molded asbestos so that renewal is necessary only after long periods of service.



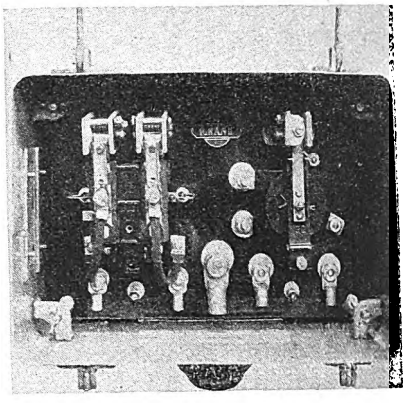
New mechanically operated brake for cranes

The tendency toward the use of anti-friction bearings on cranes and other machinery has resulted in an increased amount of work to be performed by the brake. A crane equipped with anti-friction bearings will drift with practically undiminished speed when the controller is shut off. The result is that the brake must stop the crane unaided by bearing friction. This has necessitated improved brake design with increased wearing qualities of the friction linings.

Field Weakening Device for Tramway Motors

ON ONE of the tram cars in London, a new device has been fitted to weaken the fields of the two driving motors and thus increase the car speed above the normal top value. Field weakening is governed by the current consumption of the motors and not by the speed of the car. Hence, although higher speeds are obtained, overheating and damage to the motors are prevented.

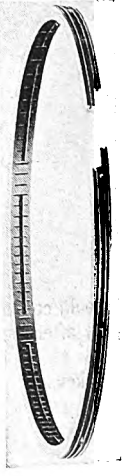
The "Auto Shunt" consists of a double pole contactor switch with powerful magnetic blowouts, mounted on an insulated base with a special controlling relay, and enclosed in a weatherproof housing. The relay has its operating coil in series with the two driving motors. Adjustment is such that when the motor current drops to a suitable value, provided the controller is in the "full parallel" position, the relay causes the contactor switch to close and connect a shunt resistance across the motor fields, whereby the motor is made to take an increased current up to a given limited maximum value. The result is that the motor speed is increased and the car continues to travel at this higher speed until the safe current is exceeded, whereupon the relay opens its contacts and field weakening is discontinued until such time as the lower current value is again reached.



The "Auto Shunt" weakens the fields of driving motors and increases speed

Ventilated Piston Ring for Bus Engines

NEED for a piston ring to serve modern, high-speed bus engines satisfactorily prompted the design of a ventilated ring by the American Hammered Piston Ring Company, Baltimore, Md. As shown in the illustration the new ring is characterized by large closely spaced slots through the center. Above and below these slots are annular grooves. The ring is hammered to establish the tension, so important in an oil control ring.



Slots through center feature new piston ring

As these rings have been designed particularly for high-speed engines, there are four scraping edges to remove excess oil from the cylinder walls. The large vents drain the excess oil rapidly because the tension created by the hammering operation holds the scraping edges in firm contact with the cylinder walls at all speeds. While this new ring is designed primarily to remove excess oil, the two annular grooves retain an ample supply of oil for lubrication at high speeds.

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News of the Industry

Atlantic City in 1929

Executive committee confirms recommendation that next year's convention be held in Jersey playground's $12,000,000 auditorium

ATLANTIC CITY is to be the next meeting place of the American Electric Railway Association. The dates are Sept. 28 to Oct. 4, 1929. This the executive committee decided at a meeting on Nov. 23 at which the committee approved the recommendations of the location committee, meeting at association headquarters on Nov. 22. It was the sense of the location committee that the convention open officially Monday morning, instead of on Saturday, and that the convention committee should consider the idea of giving Monday afternoon and Wednesday morning over to an inspection of exhibits. Mr. Dickey, manager of the new Atlantic City auditorium, and Mr. Skene, representing the convention committee of that city, assured the locations committee that the building, now in process of erection, would be completed in time for the installation of exhibits and the holding of the regular meetings of the American and affiliated associations.

Atlantic Foto Service

$12,000,000 meeting place of A.E.R.A. in 1929

Mr. Dickey explained that there would be approximately 100,000 sq.ft., net, of exhibit space on the floor of the main auditorium. For the meetings the stage could be shut off from the exhibit hall by a soundproof curtain and there would also be the main ballroom on the balcony floor seating approximately 3,500, a smoking room which would seat 200, and ten rooms, also on the balcony floor, which would seat comfortably about 125 persons each. Buses under their own power could be run up ramps right onto the main exhibit floor. It was proposed to construct tracks on the plaza in front of the building, looking out upon the ocean, for the accommodation of eighteen cars. Tracks arranged on either side of the main building would provide additional space for the car and allied exhibits.

When completed the Atlantic City auditorium will be the largest and finest building of its kind in the world. It will cost, completely equipped, about $12,000,000. The main auditorium presents a vista from end to end unbroken by columns or supports, with its main spans 350 ft. in width and at an elevation of 130 ft. above the floor. Decoration will be lavish but tasteful. This last feature is advanced as being of some importance in that it will not be necessary for the association to expend any money for decorations. The grand ballroom promises to be one of the most magnificent public rooms in the world. It is located on the balcony level at the end of the building nearest the ocean, and will open onto a superb loggia overlooking the plaza and the ocean.

Another Use of Weekly Pass on Pacific Electric

Further experimenting and use of the card pass form of ticket on lines of the Pacific Electric Railway, Los Angeles, Cal., was recently announced with a new form of weekly pass. To be tried out exclusively on the railway's lines to Redondo Beach and points en route the $2.75 weekly pass became effective on Oct. 28. This weekly pass supersedes the former monthly pass sold previously on the Redondo Beach lines at a $13 monthly rate and referred to in the JOURNAL of Aug. 11, 1928.

Like the monthly pass, the new weekly pass is transferable and may be used at the option of the holder as frequently as possible during the seven-day period for which its use is prescribed. The new pass becomes effective on Sunday of each week and is good to and including the following Saturday. It also carries the provision of the monthly pass in that it may be used on all local cars of the Pacific Electric within the first zone in Los Angeles.

Decision to try out the weekly form of pass was due to the fact that numerous persons received their pay checks each week and requested that the weekly form be tried out to determine its popularity with patrons.

New York Drafts Plans to Run Its Subways

Plans for the operation of the major part of the Manhattan lines of the new city subway system in New York to begin early in 1930, have been announced by the Board of Transportation. Provisions for passenger transfer facilities with lines of the Brooklyn-Manhattan Transit Corporation and the Interborough Rapid Transit Company at seven points in Manhattan reflect the influence of the unification negotiations now pending with the B.-M. T. and take into consideration also possible recapture of I. R. T. lines.

Negotiations for power supply have reached almost their final stage, after a long series of conferences among engineers of the Board of Transportation and representatives of the New York Edison Company, the United Electric Light & Power Company, the B.-M. T. and the I. R. T. The board has definitely abandoned any intention of building its own power plants.

The city plans to begin operation with express service from 207th Street and Fort Washington Avenue to a temporary terminal at Church and Chambers Streets, and a local service from Broadway and 168th Street to the same temporary terminal. The Manhattan section of the new city system will run along the west side from Fulton Street to 211th Street and Fort Washington Avenue, linking with the line to Queens.

Of the seven connections with existing lines, four will be with the B.-M. T. Interchange of passengers will be possible by means of underground passageways. In the event of unification or recapture, transfers would be permitted, according to present plans. The 300 modern steel cars already ordered for use on the city's own system can be operated on the B.-M. T. The system has been so designed, furthermore, that actual physical connection with the B.-M. T. can be established for interchange of traffic. Similar connections with the I. R. T. would require extensive alterations in I. R. T. platform widths and in other details.

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Situation in Akron Clarified

The City Council of Akron, Ohio, has adopted a temporary franchise for the Northern Ohio Power & Light Company to cover the emergency until such time as a permanent franchise can be agreed upon. The railway and bus franchise, approved four years ago by an overwhelming vote of the people of Akron, has expired. On this subject of a franchise A. C. Blinn, vice-president and general manager, made this statement on Nov. 6:

The company is ready and anxious to enter into negotiations for a new transportation franchise at any time. We believe the question should be settled as early as possible in the coming year particularly because of the very large expenditures the company will be called upon to make in the summer of 1929 to keep pace with street improvements and city expansion. Two major projects are the laying of 8,000 ft. of double track on East Exchange Street and 7,000 ft. of double track on South Arlington Street. In addition to those two items, other work to be done will bring the total capital outlay up to $700,000. This work should be started as early in the spring as weather will permit.

The report of the fact finding committee will, so we are informed, be completed in a very short time, probably within the course of ten days or two weeks and negotiations could be started immediately after the report is submitted to the City Council.

As repeatedly stated heretofore, our company desires to co-operate in every way possible in providing the people of Akron with an adequate transportation service. As the city grows the question becomes of greater importance and we haven't the slightest doubt but a contract can be worked out to the complete satisfaction of both the public and ourselves and this without any unnecessary delay.

The city is entering a new area and as many of these public questions as we can dispose of now, the better able we will all be to go forward with other big things for Akron.

Car and bus lines in Akron form a complete network in and about the city. One of the biggest problems now up for settlement covers the matter of traffic. The company feels that demands are certain to become heavier on the transportation system. A committee of citizens undertook several months ago to make a thorough investigation of the company's system and study future needs and requirements. This report has not yet been presented.

Another Step in Wage Case in St. Louis

Briefs have been filed by both sides in the wage dispute between the St. Louis Public Service Company, St. Louis, Mo., and its union carmen and shop workers. The Missouri Public Service Commission has agreed to arbitrate the case. The carmen are asking an increase of 5 cents an hour, increase in number of straight runs, time and half for all overtime and increase in minimum allowance for extra men. Increases for all the non-transportation workers and a reduction in their hour of labor is also asked. The company contends it cannot afford to pay the increase asked.

Supreme Court Denies Jurisdiction in Baltimore Case

The United States Supreme Court on Nov. 19 dismissed for want of jurisdiction appeals by both the United Railways & Electric Company, Baltimore, Md., seeking a 10-cent fare, and by the Maryland Public Service Commission, opposing a 10-cent fare, and a Maryland Court of Appeals decision allowing the company a depreciation credit on valuation on the basis of "present value" of property. The appeals were dismissed because no final judgment had been reached in the cases in the lower courts.

Both the United Railways and the Public Service Commission have sought to get the case before the United States Supreme Court since a decision was handed down by the Maryland Court of Appeals some months ago. In that decision the Maryland court reversed a decision given earlier by Judge Joseph N. Ulman, who held that the rate of return possible under the three-fares-for-a-quarter plan approved by the Public Service Commission was confiscatory. The Court of Appeals held that it was not confiscatory.

The United Railways sought a review of this. The Court of Appeals held that the Public Service Commission had erred in fixing the depreciation allowance to the company on the basis of the cost to the company of the property depreciated. It held that this allowance should be based on the replacement cost; what it would cost the company to replace the property at the present time.

The Public Service Commission sought a review of this element of the case. The decision of the Supreme Court is a refusal to hear the claims of either party.

In the new hearing to settle the depreciation point, H. Carl Wolf, chief engineer of the commission, suggested an increase in the depreciation allowance from $880,000, which was set by the commission in the first hearing, to $1,687,000. In fixing the new figure Mr. Wolf explained that he reached this amount by means of a physical inspection of the company's depreciable property.

On the other hand, Charles Nodder, chief accountant for the commission, favored an annual depreciation allowance of $1,269,000. The United, however, claims a fair amount would be $2,200,000. The commission now has the three amounts with which to deal.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Dec. 7 **— Metropolitan Section, American Electric Railway Association and Metropolitan Section, Society of Automotive Engineers, joint meeting, 33 W. 39th St., New York, N. Y.**

Dec. 10**—National Highway Traffic Association, annual meeting, Automobile Club of America, New York, N. Y.**

Jan. 14-18, 1929**—American Road Builders' Association, convention and road show, Cleveland, Ohio.**

Jan. 22**—New York Electric Railway Association, mid-winter meeting and dinner, Hotel Commodore, New York, N. Y.**

Jan. 23-25, 1929**—Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.**

Jan. 24-25**—Central Electric Railway Association, Claypool Hotel, Indianapolis, Ind.**

Jan. 25-26**—Central Electric Railway Accountants' Association, Claypool Hotel, Indianapolis, Ind.**

Jan. 28-Feb. 1**—American Institute of Electrical Engineers, annual convention, 33 W. 39th St., New York, N. Y.**

Feb. 14**—Central Electric Railway Master Mechanics' Association, Youngstown, Ohio.**

Messrs. McIlraith, Gould and McClintock on Program

Members of the National Highway Traffic Association will hold their Tenth Annual Meeting at the Automobile Club of America in New York City on Dec. 10, 11 and 12. An interesting program has been outlined, which includes the following addresses: "Economic Utilization of Highways," by George H. Pride, Pride Transportation Company; "The Necessity of Research in the Solution of Traffic Control Problems," by H. M. Gould, Consulting Transportation Engineer of Detroit, and "Problems of Efficient Street Use by Vehicles and Pedestrians," by Dr. Miller McClintock, Director of the Erskine Bureau of Street Traffic Research, Harvard University.

Eighteen national committees will present reports at the meeting. Among these are: "Effects and Regulation of Overloading and Overspeeding of Trucks and Buses," to be presented by D. C. Fenner, Public Works Department, International Motor Company; "Safety Code for Brakes and Brake Testing," by H. H. Allen, Bureau of Standards, United States Department of Commerce; "Traffic Control on Car Tracks Adjacent to Safety Zones," by E. J. McIlraith, staff engineer Chicago Surface Lines; "Municipal Organization for Solution of Traffic Control Problems and Formulation of Regulations," by T. Fitzgerald, vice-president Pittsburgh Railways; "Terminology of Traffic Control," by Harold S. Buttenheim, Editor the *American City Magazine*, and "Parking Regulations," by Prof. Roger L. Morrison, University of Michigan.

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Ten Cents Sought in Kansas City

Company enumerates reasons for necessity of higher fare. Does not countenance trunk line buses. Decline in traffic alluded to by President Groner

A REPORT setting forth the necessity of a 10-cent fare in Kansas City, Mo., has been submitted by the Kansas City Public Service Company. The report was given to the City Council on Nov. 19, and the Council received and filed the document, indicating that since the report was merely an informative article, the Council would take no action on it at this time. In the form of a 52-page document prepared by Powell C. Groner, president of the company, the statement submits that a 10-cent fare is necessary in order to improve the service, provide employees' pensions, and a wage advance, and eliminate the threat of a receivership.

A proposal to couple three tokens for 25 cents with a basic 10-cent fare was opposed. The company believes that a combination of this kind would be utterly inadequate to apply on the program and pay preferred stock dividends.

It states that the continuance of trunk line buses is an economic mistake, although continuance of bus service with new equipment is promised if the fare increase is made. Bus operations according to the report have resulted in a loss of approximately $280,000 a year, this deficit necessarily being made up from the revenue derived from railway riders. This is a heavy tax on the transportation system as a whole to provide bus service for only 3 per cent of the total passengers. It is said that the seeming public demand for such service was not real if bus patronage can be used as an index, and that apparently such a duplication of transportation facilities at so great a cost is an economic mistake and that the buses would perhaps serve a better purpose if used only for feeders and to supply transportation where none now exists.

The suggested remedy of a return to lower fares is met with a statement that it would require 165,000,000 revenue-passengers at 5 cents to meet the present cost of service, whereas at the peak of riding in 1922 the company had only 136,000,000 passengers.

Service improvements urged at this time are estimated at $835,000. Economies anticipated from the rehabilitation of the system and the complete adoption of one-man operation brought a cut in operating expenses in 1928 of $930,000 under the expenses of 1926. However, with the decline in traffic showing only slight abatement the company warns that it has reached the limit of its ability to effect further operating economies.

Last year the company lacked $453,421 of earning the permissible return of $2,065,110 and in nine months this year has fallen $455,466 short of earning as much as the franchise would permit.

According to Mr. Groner an ordinance for an increase in fare will not be submitted until the public has been acquainted with the facts.

In discussing the decline in street car riding Mr. Groner attributes it to the following four causes:

The 59 per cent increase in motor cars in Jackson and Wyandotte counties since 1922, every new car on Kansas City streets generally meaning at least two fares a day less for the company.

The growth of outlying community business centers, bringing a decrease in shopping or non-rush hour riding.

The radio and outlying theaters cutting night riding.

Traffic congestion, slowing up service.

Elimination of parking, increase in arterial streets, clearing of motor cars from street car tracks and the reduction of the number of street car stops to about seven a mile are listed as methods to speed up service as much as 20 per cent. The Councilmen with the exception of two stated they were opposed to the fare increase.

New York Case Must Be Reargued on Jan. 14

In an order read from the bench on Nov. 19 by Chief Justice Taft, the United States Supreme Court directed a reargument on Jan. 14 next of the case by which the city of New York seeks to prevent the Interborough Rapid Transit Company from increasing the 5-cent fare to 7 cents.

There is an intimation that the present record is too voluminous and that the new one must be curtailed. The court bluntly stated that the new briefs "shall be compact, logically arranged with proper headings, concise and free from burdensome, irrelevant and immaterial matter."

The text of the order follows:

159 Gilchrist, et al., vs. Interborough Rapid Transit Company.

This case is ordered to be restored to the docket for reargument on Jan. 14, 1929.

The same limitations as to the time of argument and the number of counsel as in the original hearing shall apply. It is directed by the court that new briefs shall be filed complete, and that the old briefs heretofore filed shall not be used.

The new briefs shall be compact, logically arranged with proper headings, concise, and free from burdensome, irrelevant and immaterial matter. The appellants shall prepare and file their briefs on or before Dec. 17, 1928.

The appellees shall prepare and file their briefs on or before Jan. 2, 1929, and the appellants shall file reply briefs by Jan. 9.

As a rule, the court directs that a case be reargued only where the court regards a pending record as too voluminous for consideration. In the Interborough case, now pending on appeal from the decree of the statutory court prescribing a 7-cent fare, sixteen briefs, numbering about 2,700 pages and containing about 878,000 words, were filed. This apparently was too much for the court and led to the issuance of the order read by Chief Justice Taft.

The 7-cent fare litigation began on Feb. 1 last, when the company filed its petition with the Transit Commission, and followed this action by filing suit in the United States district court two weeks later. According to the company's counsel the 7-cent fare, although suspended, has been the legal fare on its subway and elevated lines since March 3 last. On this basis the company estimates that it will have lost millions in uncollected fares during the pendency of the case should the ultimate decision be in its favor.

One effect of the order made by the Supreme Court on Nov. 19 will be a drastic reduction in the size and volume of the new briefs as compared with those filed in October.

Out of a Clear Sky

WELL, it was high time something was done about lawyers' English.

It would be a lot more fun for the judges, for the court attendants, for the reporters and for the general public if the lawyers hired writers to do their important briefs. One wishes there had been some way whereby the United States Supreme Court, instead of sending the tangled mass of verbiage in the subway fare case back to the lawyers who had caused the tangle, could have assigned the revision of the briefs to Ring Lardner. A brief on the subway rate increase by Ring Lardner would be more fun than a brief on the same subject by Charlie Craig or Sam Untermyer. Mark Twain should have written the Dred Scott decision, and what Elinor Glyn could have done with the briefs in the famous Danbury hat case is nobody's business.—Frank Sullivan in the New York *World*.

Way and Structures No. 5

Outlining work to be undertaken and the appointment of sub-committees occupied the attention of members of way and structures committee No. 5 on wood preservation at a meeting held at association headquarters, New York City, on Nov. 19. Those present were C. A. Smith, chairman, A. B. Campbell, M. J. Curtin, Chester F. Gailor, Ernest F. Hartman, Leo P. Scanlan, F. H. Swayze, H. J. Lucey representing B. Kuckuck, and George McCaskey representing J. S. Ware.

Illinois Rate Advance Extended

The Illinois Commerce Commission on Nov. 17, extended to May 24, 1929, the proposed advances in rates for street car and bus service sought by the Illinois Power & Light Company. Services in Bloomington, Normal, Danville, Quincy, Galesburg, East Galesburg, Champaign, Urbana, Decatur, Jacksonville and East Jacksonville will be affected.

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Michigan Towns to Vote on Franchise

Granting of a 30-year franchise to the Detroit United Railway to operate its interurban cars in Troy and Avon townships is to be voted upon in the two townships at a special election to be held on Dec. 1. Although the proposition has been rejected by the voters at Clawson and Royal Oak it is expected that a favorable vote will be given in both the Rochester townships.

Suburban Long Island's Transit Needs Urged

Daniel L. Turner, transportation expert, was the speaker at the annual luncheon of the Long Island Chamber of Commerce, held at the Hotel Pennsylvania, on Nov. 21. He dealt with the transit needs of that portion of Long Island which lies within the area of the Suburban Transit Engineering Board, established jointly by the North Jersey Transit Commission and the Port of New York Authority to study and recommend a solution of the traffic problem as it affects the area which lies outside the limits of the greater city and within a radius of 40 miles of City Hall.

This territory now includes the townships of Babylon and Huntington in Suffolk County, the whole of Nassau County and that part of Queens County beyond the border of Queens Borough. He said this area is being dealt with as a unit by a sub-committee of the board, as are likewise the two other suburban sectors comprising, on the one hand, Westchester and Connecticut, and on the other, North Jersey and Rockland County.

Commuters Oppose Postponed Advance by Aurora & Elgin Case

A petition was filed with the Illinois Commerce Commission on Nov. 14 by the Commuters' Protective League, asking for the appointment of an auditor to go over the books of the Chicago, Aurora & Elgin Railroad to determine if a proposed increase of 20 per cent in commutation fares between Chicago and western suburbs is justified. The League is a group of west suburban residents organized recently to oppose the railroads' application for higher fares. It charges that an additional fare increase will hamper the growth of their communities and restrict travel to and from Chicago. According to Secretary Brown of the organization the request for an increase in rates is regarded by that body as unreasonable.

Final hearing of the case has been postponed until Nov. 28 at the request of attorneys for the Commuters' League. In opposing the postponement of the hearing, counsel for the company asserted that the delay in hearing the case was costing the railroad $10,000 a month, providing the application is finally approved.

Edward J. Mehren

McGraw-Hill Expands in Middle West

Four McGraw-Hill papers now published in Western metropolis. Fifth soon to move to Chicago. Edward J. Mehren resident executive

SIGNALIZING the rapid development of its publishing operations, the McGraw-Hill Publishing Company, publisher of ELECTRIC RAILWAY JOURNAL, is having erected for it in Chicago a building to bear its name and for the first time is placing there a resident vice-president as head of its Chicago interests. The building is now in course of erection at 520 North Michigan Avenue, two blocks north of the Wrigley Building in a rapidly developing new business center and will house all the McGraw-Hill interests centering in Chicago. The resident vice-president will be Edward J. Mehren, a native Chicagoan, who has been with McGraw-Hill in New York for 22 years in editorial and publishing capacities.

New home of McGraw-Hill in Chicago

These two moves are a logical result of the rapid expansion of the company's activities in Chicago. It now publishes there four papers, *The Magazine of Business, Factory and Industrial Management, System,* and *Harvard Business Review,* the last issued for the Harvard University School of Business Administration. A fifth magazine, *Industrial Engineering,* will shortly be transferred from New York to Chicago.

These developments have long been planned by the company. For 25 years it has maintained in Chicago large editorial, sales and circulation staffs, in intimate contact with those who have been making engineering and industrial history in that territory. This has impressed on the organization the great engineering and industrial strides of the Middle West and its still greater potentialities. To be more intimately a part of that development, present and forthcoming, the company had long planned to publish part of its group of papers there, and having accomplished this purpose, now signalizes its establishment of a great publishing house in Chicago, by taking its own building and establishing there a resident vice-president. More than 400 employees are now attached to the Chicago office.

Edward J. Mehren, the resident vice-president, was born in Chicago and educated at the University of Illinois. After a short period of service in the civil engineering corps of the Burlington and the St. Paul railroads, he became associate editor of *Engineering Record,* and in succession, editor of that paper, editor of *Engineering News-Record,* vice-president in charge of publication of four of the company's magazines, and, finally, vice-president and editorial director, in charge of editorial work of all its properties. Recently, he was appointed editor of *The Magazine of Business.* He will continue that responsibility as well as the resident vice-presidency.

James H. McGraw, chairman of the board of the company, commented on these developments as follows:

> The publishing interests of the country have long been aware of the advantages of location near the center of population and industry. These have been advancing steadily westward. The inevitable conclusion is that a house of national interests, particularly when it has a number of papers, should strengthen its position by decentralizing its operations and should not concentrate its forces in one center.
>
> This step constitutes another forward movement in the steady growth in the McGraw-Hill organization as an effective institution for serving American industry and business. It marks the realization of my hope of many years that the company should have a strong publishing house in the Middle West, at a second major radiating point, giving practical expression through the various channels of its activities, of the service opportunities and ideals of the McGraw-Hill company. The organization has always been national and international in thought and purpose. Now it takes another step forward in the physical expression of its aspirations and of the policies expressed in its papers.

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Charges Growing Out of New York Accident Dismissed

The last official investigation into the Times Square subway wreck of Aug. 24 closed on Nov. 19 with the dismissal of charges against Harry C. King, towerman. King's case went to jury on Nov. 16. On Monday that body filed with Judge Mancuso a dismissal of the charges against him. He had been held for second degree manslaughter after a hearing in Homicide Court before Justice Corrigan.

The accident cost eighteen lives and occasioned injury to more than 100. The Transit Commission expressed the opinion that the wreck was due to "man failure," but William S. Baldwin, maintenance foreman, had the charges against him dismissed in the Homicide Court hearing which held Mr. King. The action of the jury on Nov. 19 apparently ends the attempt to place the blame for "man failure" on anyone.

Mr. King, a train clerk who occasionally acted as towerman, had been charged by the District Attorney with actuating the devices in the tower which sent the last cars of the heavily loaded south-bound express train hurtling through an open switch and caused one of them to be sliced in half against a concrete pillar.

Another Rapid Transit Act to Be Discussed in St. Louis

The terms of a rapid transit enabling act for St. Louis, Mo., to be introduced when the Missouri Legislature convenes at Jefferson City on Jan. 2, next, will be discussed at the next meeting of the Transportation Survey Commission of the city. Copies of the enabling act of 1927, which failed of passage, have been printed and sent to each member of the commission for consideration. The members have been asked to make a study of the measure and determine how it can be improved.

The last enabling act died in committee because of the opposition of downtown property owners who objected to a clause which provided that the rapid transit improvements should be paid "in whole or in part" by special assessments against property in the areas served by the system.

Renews Request for Increase in St. Paul

With the petition by the Minneapolis Street Railway, Minneapolis, Minn., for an increase in the rate of fare, renewal of the request for an increase was made by the St. Paul City Railway, St. Paul, Minn., and an added petition was for increase in rates for Stillwater and Bayport, which are on a suburban line operated out of St. Paul. A brief cited that the Minnesota Railroad & Warehouse Commission had postponed a hearing on this previous request for St. Paul five times and since the last continuance has failed to set a date for the hearing. In the case of the St. Paul City Railway the company claims a value of at least $16,608,543, as of Jan. 1, 1928, and states it has earned only 2.53 per cent on this valuation the first nine months of the year.

In the case of the Minneapolis company the brief states that while the commission on July 3, 1925, fixed its property valuation as of Jan. 1, 1925, at $26,787,228 the valuation as of Jan. 1, 1928, is at least $27,492,729, a figure arrived at by adding the cost of additions since 1925. On the company's valuation basis the return is estimated at only 4.15 per cent, whereas the commission had set 7½ per cent as a reasonable return.

Taxis a Menace in Massachusetts

The Springfield Street Railway objected to the coming to that city of a taxi company which proposed to charge 50 cents to any part of the city, when the Transportation Board of Springfield, Mass., held a hearing recently on the subject. Under a schedule of this kind the railway contended it would be possible to fill up spare taxis at factories and thereby cut heavily into the revenue of the railway.

In Worcester the Consolidated Street Railway is confronted with the competition of taxis that operate under a flat rate of 35 cents in the city limits. The flat rate started a taxi war, but eventually all the concerns came to an agreement to maintain that rate. The railway has not felt this form of competition to anything like the alarming degree that was anticipated at first.

Time for All Things

PHILADELPHIA RAPID TRANSIT has wisely determined to make necessary track changes in the downtown district hereafter only during the night hours. This practice will make for the greater convenience of the public and reduce the source of traffic delays and congestion. It will be adhered to except in cases of emergency.

In this policy the company should have the practical cooperation of the municipality. There is already in operation a system of co-ordinated effort in the matter of paving repairs on streets occupied by trolley tracks, but the plan might profitably be extended to many other forms of public work involving the opening of streets. Night work, however, promises to be the most effective contribution toward the speeding up of traffic, for, even though the initial cost may be greater, the saving resulting from the reduction in the number of interruptions by traffic should nearly if not quite equalize the cost factor.—*Public Ledger.*

One-Man Car Rights Refused in Oakland

Permission to operate one-man cars over four lines has been refused the Key System Transit Company by the Oakland City Council by a margin of one vote. Mayor John L. Davie voted against the one-man cars and his protest was sufficient to prevent a Council majority in their support. Frank Colbourn, commissioner of public works, who moved to grant permission for their operation, and Charles C. Young, commissioner of public health and safety, voted in favor of the measure.

The four lines involved have been operated under one-man service continously for eight years, part of that time contrary to terms of a city ordinance which forbade one-man car operation in the city of Oakland.

The 90th Avenue, Fruitvale Avenue and 23rd Avenue lines have been operated with one-man cars since 1920, while the Cemetery line at the head of Piedmont Avenue has operated under one-man service since 1903.

No letters of protest against granting permits for the four lines had been filed, according to City Clerk Frank C. Merritt.

A Gesture Which Won Good Publicity in Portland

The Portland Electric Power Company, Portland, Ore., gave free rides recently to the Pacific International Livestock Show to all passengers from the steamer *Malolo*. The landing of this steamer in Portland Harbor was a memorable occasion. It was the first large ship to carry passengers direct from Portland to Hawaii. The vessel was the show place in the city while it remained, and all passengers were highly fêted, being taken for drives and entertained socially.

The steamer landed during the week of a stock show which was attracting thousands, and the rides offered by the Portland company were a courteous gesture much appreciated.

New Subway Plan Advanced for Detroit

Plans for a subway system for Detroit, Mich., are to be submitted at the spring election if the Mayor and the Council approve, says Colonel Waldon, chairman Rapid Transit Commission. The financial plan advanced previously has been revised so that yearly costs will be provided for by bond issue.

Since the new plan has been advanced Councilman Littlefield has announced that he will oppose the Transit Commission's plans for the subway system, and advocate subway dips for street cars downtown. Colonel Waldon, chairman of commission, declares Mr. Littlefield's scheme would not give sufficient relief and tunnels could not be used later as part of the subway system.

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Foreign News

New Law in England Curbs Bus Competition

By a vote of 192 against 118, the English House of Commons, passed the second reading of the Nottinghamshire & Derbyshire Tramways trolleys vehicles bill recently. This bill, which was promoted by the tramway, grants a virtual monopoly on the routes operated. The bill provides that so long as the tramway furnishes a service of tramways or trolley buses which adequately meets requirements, it shall be unlawful for any other company or any local authority to run buses along the company's routes in competition with the company. It is also provided that existing bus services are not to be interfered with and that the Minister of Transport is to determine any question arising as to adequate service or competition.

Labor members of Parliament opposed the bill on the ground that it would establish a monopoly detrimental to the public interest. Colonel Ashley, the Minister of Transport, in supporting the bill, pointed out that apart from London the principle of limitation already exists in Oxford and in a bill now passing through Parliament relating to Greenock. In both these instances the privilege was granted to companies, and the same principle should apply to companies as municipalities; that is, the reduction of wasteful competition by restriction of bus services.

Dublin-Lucan Line Reopened

After having been out of operation for a number of years, the street car line running from Dublin to Lucan, Ireland, has been reopened. This line is approximately 9 miles in length and has two competing bus lines.

Tramway Offices Burned

The building occupied as the offices of Salford Corporation Tramways in England was destroyed by fire recently. The basement of the premises was occupied as a wall-paper warehouse and the fire originated there. Many of the records of the tramway department as well as 20,000,000 tickets were lost.

Salford, though a separate borough, is really one city with Manchester in regard to continuity of buildings and streets, and the Manchester tramway department came to the help of Salford and thus prevented tramway traffic arrangements from being disorganized. Tickets were also borrowed from Bury Town Council and the South Lancashire Tramways with which as with Manchester, Salford has inter-running agreements. A new supply was also ordered and delivery began on the following day. To accommodate the tramway office staff the social room of one of the tramway depots was converted into a temporary office and some other municipal offices were utilized.

Argentine Contracts for Great Britain

Contracts have been placed by the Central Argentine Railway with the Metropolitan Carriage Wagon & Finance Company, Birmingham, for the supply of 30 motor bogie first-class coaches and with Cammell, Laird & Company, Nottingham, for thirteen first-class trailer coaches and six second-class trailer coaches. These coaches are for use on the electrified lines around Buenos Aires, Argentina.

Progress in Paris Electrification

Electrification of the steam line connecting Paris, Saint Lazare and Versailles is nearing completion. This work marks an important step in the development of electric lines serving some of the more distant suburbs of Paris, bringing the total electrified mileage operated by the Chemins de Fer de l'Etat to 56 miles and the total daily number of electric train-miles to 9,321.

Four groups of trains will be operated on the new line to Versailles; the first group will provide a local service between Paris and Becon-les-Bruyeres over a distance of 4 miles from Paris; a second group will provide non-stop service to Becon-les-Bruyeres, and local service between that point and Versailles; the third group will provide non-stop service between Paris and Saint Cloud and local service therefrom; the forth group will provide a non-stop service between Paris and Versailles direct.

Street Railway Operation in Zurich

Twenty-one routes, representing 68 miles of track, are now served by the Zurich municipal tramway, Zurich, Switzerland, according to the annual report sent out by the director. This is an increase of 1¾ miles over 1926. The figures show:

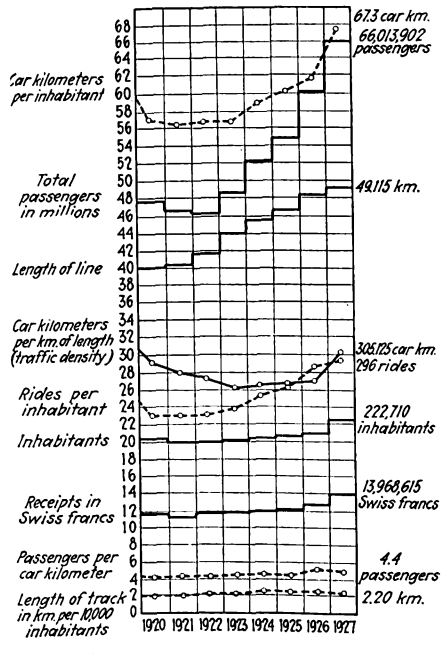
	1927	1926
Car-miles operated	9,366,401	8,137,196
Passengers carried	66,013,902	60,350,836
Total revenue	$2,793,723	$2,608,039
Total operating expense	$2,273,909	$2,072,975

The rolling stock equipment at the end of 1927 consisted of 203 motor cars and 157 trailers, a number of old motor-equipped cars having been converted to trailers. Of the latter 98 are now fitted with electro-magnetic brakes.

The quantity of energy consumed by the six transformer stations supplying the tramway system advanced from 11,761,720 to 13,463,815 kw.-hr. The number of officials and workers employed in connection with the tramways increased from 1,241 in 1926 to 1,344 last year; the last mentioned number includes 304 drivers and 570 conductors.

The report adds that the municipal authorities have voted a sum of $524,000 for the construction of two large car-houses and that considerable discussion took place on a proposal to adopt four-axle cars. Eventually this matter was referred to a committee and as the result of its report an order has been placed for twelve new two-axle cars, each axle being fitted with a 76-hp. motor working at 600 volts.

The accompanying chart gives a number of interesting comparisons of operation which cover a period of about eight years.



Meeting Bus Competition

In order to combat competition by buses, the London & Northeastern Railway is now issuing return tickets at single fare on their electrified lines in the northeast of England.

Ecuador Railway Sold

The Empresa Electrica del Ecuador, controlled by the Electric Bond & Share Company of New York, has sold its local street railway, Tranvias de Guayaquil, to Rodolfo Baquerizo Moreno. It is understood that 50,000 sucres ($10,000), was paid for real property rights, such as rails and rights-of-way; and 200,000 sucres ($40,000) for cars and other equipment. The operations of this line will be extended and it is expected that an increase in fare from $0.01 to $0.02 (U. S. currency) will be granted by the municipal government.

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Recent Bus Developments

Competitive Plan Rejected

Los Angeles board turns down plea for franchise for 5-cent line to compete with Los Angeles Railway

NO GRANT for the operation of a bus line with a 5-cent fare over streets used by the Los Angeles Railway, Los Angeles, Cal., can legally be granted to Charles A. Palmer, who made the application, according to information furnished to the Board of Utilities. A report against the plan was adopted.

Mr. Palmer is president of the Comanche Mining & Reduction Company. He had sent a communication to the Mayor proposing the bus line as a rival to the railway service because of the increased fare. He explained that if granted a franchise he would organize a company to establish the bus service. The proposal was passed to the City Council, which passed it to the utilities body. Mr. Palmer asked for a twenty-year franchise.

Deputy City Attorney James Ronald presented an opinion that there was nothing to act upon, as the proposed bus concern had not been organized and everything appeared contingent on the possible granting of the franchise. In addition, the board was without power to grant other than a yearly permit with possibilities of annual renewal, which would not make a twenty-year franchise on which to organize a bus company.

Report of General Manager Marsh of the Board of Public Utilities and Chief Motor Vehicle Inspector Gunn to the board, in part, follows:

In analyzing the communication of Mr. Palmer it would appear that this is not an application for a bus franchise, but is a statement that if the Los Angeles City Council will grant him a twenty-year franchise he will proceed to organize a bus company.

In checking over Ordinance No. 58198, the ordinance regulating the operation of buses over streets of the city, we find:

"It shall be unlawful for any person to operate or cause to be operated, any bus owned or controlled by him for transportation on any street in Los Angeles without first having obtained a permit in writing from the board to do so."

The balance of the section provides how application shall be filed and the procedure to be followed.

Section 5 provides that no bus shall be operated within a certain restricted area which might be defined as Main, Spring, Broadway, between First and Eighth Streets.

From all of the above it would appear that no long-term franchise can be granted by the Council or Board of Public Utilities. It also would appear that there is a certain area in which bus operation is not permitted and if a bus company was to parallel the lines of the Los Angeles Railway it would be necessary for it to enter this area, all of which brings about a condition similar to that of the McAdoo interests, which were presented for a vote of the people several years ago and defeated.

We are not going into the engineering or transportation features of this case at the present time, but are submitting the above to the board for its information and consideration, with recommendation that the information contained therein be transmitted to the Los Angeles City Council through its Public Utilities Committee.

Preparing for Detroit's New Bus Service

The Detroit Department of Street Railways has ordered 120 additional new buses. These, with the ones previously ordered and 50 more, the purchase of which is contemplated immediately if they prove satisfactory, will supply the 200 de luxe buses promised by the department to replace the jitneys. The jitneys were recently ousted from the main Detroit streets as a result of the decision handed down by the Michigan Supreme Court over the long-fought issue. All the buses will be of a de luxe type and will be operated along the same routes or along routes paralleling the former lines of the ousted jitneys.

While the rate of fare to be charged on the new municipal buses which are to replace the jitneys ordered off the streets has not been definitely determined, it has been intimated by Del A. Smith, general manager of the municipal system, that the fare will be based upon a zoning system, and will vary from 25 cents for the extreme length of the line to 10 cents for the shorter rides. This will be somewhat in excess of the rates formerly charged by the jitneys. The general manager expressed the opinion that these 200 de luxe buses will give better service and handle more passengers with less confusion and street traffic delay than did the 500 jitneys.

Nine new bus routes have been approved by the City Council and the buses will be put into operation over these lines as fast as they are delivered. It is planned to have a number of the buses in operation by Dec. 1, and to have them all in operation by Jan. 1, 1929.

Would Accommodate Employees of St. Louis Flying Field

The St. Louis Public Service Company has asked the Missouri Public Service Commission for authority to divert part of its bus service now in operation over federal highway No. 40 between Wellston and St. Charles, Mo., so as to furnish morning and late afternoon service between St. Louis and the St. Louis Flying Field at Bridgeton. It is proposed to have the bus which leaves the Wellston Loop at 7:30 a.m. make a side trip to the flying field over the Lucas and Hunt, the Natural Bridge and the Bridgeton Station roads and the bus leaving St. Charles, Mo., at 4:45 p.m. would make the same side trip for the accommodation of employees of the flying field who reside in St. Louis.

More Bus Rights in Waterloo

Announcement has been made by Supervisor Leroy McDuffie that the Waterloo, N. Y., town board has granted a restricted franchise to the Geneva Railway Bus Lines, Inc. Claude R. Mann, operating the Finger Lakes Rapid Transit, withdrew his request for a franchise and his objections to the Geneva concern. During this meeting of the executive session of the town board of Waterloo, a proposed third line sponsored by Seneca Falls interests entering the field was discussed but no formal application for a franchise was made. Contingent upon the bus franchise being passed is an agreement that the Geneva, Seneca Falls & Auburn Railroad settle with Waterloo for taxes and assessments.

Seeks Ten-Cent Fare in Marlboro

The Massachusetts Public Utilities Commission has asked the Boston, Worcester & New York Street Railway to file an amended schedule reducing the bus fare within Marlboro during the peak hours to 10 cents. This friendly action was the result of a petition filed by Mayor Winfield Temple of Marlboro, the company expressing its willingness to make such reduction if the commissioner ordered it. The bus line was established just previous to discontinuance of the company's cars.

New Lines Will Serve Hudson Valley Route

The New York Public Service Commission granted a certificate on Nov. 16 to the Hudson Transportation Company, Inc., for the operation of bus lines between Glens Falls and Hudson Falls and Fort Edward; in Glens Falls and Saratoga Springs; and between Glens Falls and South Glens Falls.

The Hudson Valley Railway is now operating in communities proposed to be served by the new bus lines. Stockholders of the railway voted on Oct. 11 last to abandon the entire trolley service and the new bus line will provide transportation in its place after Dec. 1. Inasmuch as trolley operations will cease the commission holds that bus service will be necessary. The certificate just issued by the commission follows the granting of consents, where necessary, by the municipalities in which the bus line will operate.

Buses will be operated on practically the same schedule as now in effect by the railway, the company using 24 buses. A 10-cent fare zone will include South Glens Falls, Glens Falls and Hudson Falls, with transfer privileges to other

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buses in Glens Falls. An additional 10 cents will be charged between Hudson Falls and Fort Edward and the Saratoga-Glens Falls ride will cost 80 cents.

New Services Authorized in San Diego

A certificate of public convenience and necessity has been granted by the California Railroad Commission to the San Diego Electric Railway to operate auto stage service along Market Street in that city between 25th Street and Euclid Avenue (51st Street) and intermediate points. The commission has also granted a certificate to the company to operate auto passenger service between La Mesa and Spring Valley Junction and intermediate points.

Experiment in Portland to Determine Needs

The Portland Electric Power Company, Portland, Ore., has extended its Willamette Boulevard bus route about 1 mile. The experiment is to be tried for 60 days to determine whether the service fills the need of the district according to the opinions of the residents and the City Council. This new service is not only longer in mileage, but affords important connections with other buses and city car lines.

Belt Line in Boston

A license to operate a belt line of buses around Dorchester has been granted to the Boston Elevated Railway, Boston, Mass. The action followed a study of transit conditions covering a period of four weeks. Fare on the route is 6 cents.

Supplementary Service Suggested for Houston

Plans for supplanting present railway service with a local bus service two miles long on Fannin Street, which is to be widened and repaved, were recently submitted to the city of Houston, Tex. These plans involve increased operating expenses estimated at from $72,882 to $126,452, annually, with no commensurate increase in revenue.

The Beeler Organization was asked by Mayor Holcombe to analyze the plans and study the whole problem. Its report does not approve the substitution as planned. It recommends, however, that the Fannin Street car line, the heaviest in the city, be continued as far as McGowen Avenue, which shortens it 0.9 miles, and that a through express bus line, 4.1 miles long, be established on Main Street from Franklin Avenue to Hermann Park.

This service on Main, the principal business street, one block from Fannin, it is pointed out, will improve the service to the whole central south side as well as the central business section, and provide service to Rice Institute, which was not included in the other plans.

It is estimated that this enlarged service may cause a reduction in the net of $10,134 annually, but it is pointed out that this is only a fractional part of what was contemplated in the plans that had been previously submitted. This loss should be speedily wiped out as the proposed line connects the business district with the rapidly growing apartment section.

Service Expanded Near Petersburg

Bus service to the DuPont City section was instituted by the Petersburg-Hopewell & City Point Railway, Petersburg, Va., on Nov. 19. The buses will be run into the Atmospheric Nitrogen Company's plant area. The service will also be continued from the car depot into the plant area, thus giving it better transportation than it has had at any time in the past.

Route to Boylston and Clinton Refused Acme Bus

A permit was refused by the Worcester, Mass., license board to the Acme Bus lines to operate buses on the city streets over a proposed route to Boylston and Clinton. The chairman of the Boylston Selectmen and two Selectmen of Clinton, officials of the Worcester Consolidated Street Railway and the Boston & Maine Railroad opposed the granting of the license.

The license board after careful study decided that public necessity did not demand the operation of two bus lines to Boylston and Clinton. At the present time the Consolidated is operating buses to Clinton by way of West Boylston and also through Boylston. The Acme lines sought to give hourly service from Worcester to Clinton by way of Boylston. Under the Consolidated schedule similar service is given alternating each half hour by way of Boylston and West Boylston.

Financial *and* Corporate

Good Showing by Buffalo Company

Still further improvement in the financial position of the International Railway, Buffalo, N. Y., is shown by the company's consolidated income account for the first nine months of 1928. The statement shows a net income of $577,846, compared with $114,984 for the corresponding period last year. Operating revenue was $27,000 under that of last year, largely because of the poor tourist season, but the decrease was more than offset by operating efficiencies and economies.

Operation and taxes totaled $6,891,485 as compared with $7,306,997 last year. The reduction is due to operating efficiencies and economies, and to the fact that an amortization charge of $253,665 included in the 1927 statement was discontinued, effective on Jan. 1, 1928, with the approval of the Public Service Commission and is therefore not included in the 1928 statement. There was a decrease of nearly $50,000 in fixed charges, largely through retirement of bonds for which the holders accepted preferred stock.

CONSOLIDATED INCOME ACCOUNT OF THE INTERNATIONAL RAILWAY

Nine Months Ended Sept. 30	1928	1927
Operating revenue	$8,430,190	$8,457,031
Operation and taxes	6,891,485	7,306,997
Operating income	$1,538,705	$1,150,033
Non-operating	72,098	46,496
	$1,610,803	$1,196,529
Fixed charges	1,032,957	1,081,545
Net income	$577,846	$114,984

Amortization charge amounting to $253,665 is included in 1927 statement. With approval of Public Service Commission this charge has been discontinued effective Jan. 1, 1928, and is therefore not included in the 1928 statement.

In commenting on the continued improvement in I.R.C. financial position President B. J. Yungbluth said:

In accordance with the long established policy of Mitten Management the public is the first to benefit from the improvement. I.R.C. today is supplying service substantially better than Public Service Commission requirements. Cars are cleaner, brighter and in better mechanical condition than ever before. The number of riders who must stand because of rush-hour crowds has been steadily reduced and is much less than in any other great city of the United States. Although increased traffic congestion presents added difficulties, more than 90 per cent of all I.R.C. cars are operating on time. Safety has been greatly increased, accidents thus far being 28 per cent less than those of last year, on top of a 15 per cent reduction in 1927.

The improvement in I.R.C. credit made possible a large and costly program of track and paving reconstruction, which the company immediately undertook in co-operation with the city. Last year I.R.C. spent $250,000 for this work; this year a total of $375,000 was spent in streets selected co-operatively by the city and the company. In addition $400,000 was spent each year for track and paving maintenance, so last year's program with the work being done this year, reaches the staggering total cost of $1,425,000. In addition to the work contemplated, I.R.C. while unable to meet the demands of the city for reconstruction in additional streets, was able to co-operate by renewing its rails in those portions of Seneca and William Streets not covered by the program jointly agreed to by the city and the company.

As the sincerity of Mitten Management policy to meet its responsibility to the car riders first became evident there has developed a fuller understanding and a widespread spirit of sympathetic co-operation. The substantial accomplishments now on the record prove the wisdom of co-operative effort.

As the spirit of co-operation continues to

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develop it will become increasingly evident that I.R.C. supplies to the Niagara Frontier a transit service that will compare favorably with that supplied anywhere.

Elsewhere in this issue of ELECTRIC RAILWAY JOURNAL there is an illustrated article descriptive of some of the recent track work of the company.

Net Income on Detroit Municipal Lower for Year

For the year ended Oct. 31, 1928, total operating revenues of the Department of Street Railways, Detroit, Mich., were $24,202,398, including $3,234,332 for coach revenues, as against $23,774,542, including $3,236,849 for the year ended Oct. 31, 1927. Total operating expenses advanced from $18,179,871 to $18,881,729. These figures are inclusive of coach expenses amounting to $3,198,653 and $2,960,492 for 1928 and 1927 respectively. From a gross income of $4,777,267 in 1928 and a gross income in 1927 of $5,098,037, total deductions were $1,910,507 for this year and $1,898,474 for last year. This left a net income of $2,866,760 for this year's period and $3,199,562 for last year's period.

Statistics of the road show that the total number of railway passengers was 451,149,654 for the year ended Oct. 31, 1928, compared with 442,274,352 last year. Total coach passengers numbered 44,253,730 this year and 41,263,207 last year. Total revenue and transfer passengers were given at 495,403,384 for this year's period compared with 483,537,559 for the year ended Oct. 31, 1927.

Improvement in Lincoln's Financial Position

For the first ten months of 1928 the Lincoln Traction Company, Lincoln, Neb., reports that it has earned, applicable to dividends, $22,268, compared with only $6,577 for the corresponding period of 1927. Due to substitution of buses for street cars the revenue from cars continues to decline, while that from buses increases. The total revenues from transportation for the ten months were $383,992, compared with $376,503, an increase of $7,486, while total revenues from all sources were $395,552, an increase of $7,223. Operating expenses and taxes show a decrease of $8,406, from $330,532 to $322,126, leaving the net income after operation and taxes at $73,425, compared with $57,797, a year ago. Deducting bond interest, amortization and interest on current indebtedness, there is carried to the dividend account $22,268. Property valuation exceeded $2,500,000.

Interborough Deficit for Four Months Is $410,701

Gross revenue from all sources of the Interborough Rapid Transit Company, New York, N. Y., for the four months ended Oct. 31, 1928, was $21,543,264, an increase of $625,383 over a similar period of last year. Expenditures for operating and maintaining the property were $13,953,164, an increase of $1,145,446. The balance after deducting 5 per cent Manhattan dividend rental showed a deficit of $410,701, which represented a decrease of $107,896 over the four months' period ended Oct. 31, 1927.

More Speculation on Tacoma Situation

First-hand knowledge of the Tacoma railway situation, in all its phases, is being sought by bondholders of the Tacoma Railway & Power Company and the Puget Sound Electric Railway, through the offices of William R. Peabody, Boston attorney, who, while not himself a bondholder, has been selected to gather the information which the bondholders committee desires.

Mr. Peabody is in Tacoma studying the situation. He has conferred with Commissioner Ira S. Davisson, and with Richard T. Sullivan, general manager of the transportation lines, and others of the companies involved, and has made a personal inspection of the properties.

The bondholders have no definite plan for solving the difficulties of the local transportation companies, which are in default upon their bonds, but may formulate some plan when they receive the information he has been asked to obtain. The Puget Sound Electric is now in the hands of a receiver and its property is to be sold for its value as a discontinued line since service is to be withdrawn on Jan. 1.

There has been some talk of the Tacoma Railway & Power Company, a subsidiary of the Puget Sound Electric, also being placed in the hands of a receiver. A plan of local men, headed by S. M. Jackson, to form a new company to take over the properties fell through some weeks ago.

Supreme Court Denies Bondholders' Writ

Application for a *writ of certiorari* filed by the attorneys for the second mortgage bondholders of the old Kansas City Railways has been denied by the Supreme Court of the United States. The move was made in an attempt to get a hearing before that court. The plaintiffs contend they were discriminated against in the reorganization of the property out of which the Kansas City Public Service Company was evolved as the successor company.

Slight Decrease in B.-M.T. Net

For the four months ended Oct. 31, 1928, the total operating revenues of the Brooklyn-Manhattan Transit Company, Brooklyn, N. Y., was $16,030,178, as against $15,657,278 for a similar period of the year previous. Total operating expenses were $10,665,024 against $10,443,562 for the four months' period of 1927. After the consideration of income deductions the net income for the 1928 period was $1,826,509, compared with $1,833,712 for the 1927 period.

Conspectus of Indexes for November, 1928

Compiled for Publication in ELECTRIC RAILWAY JOURNAL by

ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Last 5 Years High	Last 5 Years Low
Street Railway Fares* 1913 = 4.84	Nov. 1928 7.69	Oct. 1928 7.66	Nov. 1927 7.56	Nov. 1928 7.69	May 1923 6.88
Electric Railway Materials* 1913 = 100	Nov. 1928 145.1	Oct. 1928 144.9	Nov. 1927 141.3	April 1923 175.3	Feb. 1928 139.5
Electric Railway Wages* 1913 = 100	Nov. 1928 229.9	Oct. 1928 229.9	Nov. 1927 228.3	Oct. 1928 229.9	March 1923 206.8
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Nov. 1928 205.7	Oct. 1928 205.5	Nov. 1927 199.4	March 1924 206.8	Jan. 1923 187.3
Eng. News-Record Construction Cost (General) 1913 = 100	Nov. 1928 209.5	Oct. 1928 207.7	Nov. 1927 202.0	March 1924 224.7	Nov. 1927 202.0
U.S. Bur. Lab. Stat. Wholesale Commodities 1926 = 100	Oct. 1928 97.8	Sept. 1928 100.1	Oct. 1927 97.0	March 1923 104.5	April 1927 93.7
Bradstreet Wholesale Commodities 1913 = 9.21	Nov. 1928 13.01	Oct. 1928 12.13	Nov. 1927 13.39	Dec. 1925 14.41	July 1924 12.23
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Oct. 1928 156.8	Sept. 1928 157.8	Oct. 1927 156.1	Nov. 1925 167.1	May 1924 141.0
Cost of Living Nat. Ind. Conf. Bd. 1914 = 100	Oct. 1928 162.9	Sept. 1928 163.4	Oct. 1927 163.7	Nov. 1925 171.8	Feb. 1923 157.5
Industrial Activity Elec. World—Kw.-hr. used 1923-25 = 100	Oct. 1928 132.0	Sept. 1928 134.5	Oct 1927 119.9	Sept. 1928 134.5	July 1924 73.4
Bank Clearings Outside N. Y. City 1926 = 100	Oct. 1928 105.1	Sept. 1928 105.7	Oct. 1927 100.4	May 1928 108.4	Aug. 1923 81 6
Business Failures Number	Oct. 1928 1664	Sept. 1928 1348	Oct. 1927 1471	Jan. 1924 2231	Sept. 1928 1348
Liabilities (Millions)	43.24	22.11	35.98	122.95	22.11

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

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Personal Items

New Company Takes Over Ohio Freight Business

D. R. Thomas is president and general manager of a new organization known as the Electric Railways Freight Company. Other officers are S. Jorgensen, secretary-treasurer; C. J. Laney, traffic manager; Edward Ackerman, auditor; F. W. Gerlach, general freight agent in charge of solicitation.

The new company takes over all the freight business of the Northern Ohio Power & Light Company, Pennsylvania-Ohio Power & Light Company and the Lake Shore Electric Railway, following the perfection of such consolidation. Joining these roads on Dec. 1 will be the Toledo & Indiana Railroad and the Ohio Public Service Company. The former line is between Toledo and Bryan, the latter extending from Toledo to Port Clinton.

Mr. Laney, who becomes traffic manager of the new organization, has been traffic manager of the Northern Ohio Power & Light Company for ten years or more. Mr. Gerlach has also been with the same company several years as Cleveland freight agent. Both men know the freight territory and have wide acquaintance. Mr. Laney had his headquarters in the Terminal Building, Akron.

Mr. Thomas has been employed by several companies in investigation work, while Mr. Jorgensen had been with the Lake Shore.

Consolidation of these freight departments will enable the companies to effect economies which could not otherwise be accomplished and it will also work to the benefit of shippers. With one directing head for the roads interchanging freight, equipment can be used to a greater advantage and with less delay. Operation can be so conducted that cars can be loaded going both ways in and out of the territory.

The office of the new company is at 704 Eagle Avenue, Cleveland, Ohio.

R. M. Feustel Mentioned for Indiana Post

Robert M. Feustel, Fort Wayne, president of the Indiana Service Corporation, is being mentioned as probable chief of Insull-owned public utilities in Indiana and as possible successor to the late Robert I. Todd, who was president of the Indianapolis Street Railway. It is regarded as improbable, however, that a successor to Mr. Todd in the directorate and official staff of a dozen or more utilities will be selected until after the Indiana Public Service Commission has acted on the merger petition now before it.

The proposed merger would consolidate into the Indiana Electric Corporation, the vast Insull-owned Central Indiana Power Company, serving 179 Indiana Communities, the Terre Haute, Indianapolis & Eastern Traction Company and the Terre Haute Traction & Light Company.

The Indianapolis Street Railway is not a party to the proposed merger, but because of the interlocking directorate of the company with the companies to be merged with the Insull interests, it is regarded not unlikely that Mr. Feustel's selection to head the corporation would result in his election to succeed Mr. Todd as head of the railway at Indianapolis.

Mr. Feustel is a national utility figure. He was construction engineer for interurban and city railway properties in Northern Indiana from 1905 to 1907; assistant chief engineer of the Wisconsin Railroad Commission from 1907 to 1913; chief engineer of the Public Utilities Commission of Illinois from 1914 to 1915, and since that time president of the Indiana Service Corporation.

W. G. MARKS, general manager of Chesterfield (England) transport department, has been appointed general manager of Nottingham Corporation Tramways, succeeding John Aldworth, who is retiring. Mr. Marks has had 27 years of experience in passenger transport. Among the tramway undertakings with which he has been associated are those of Middlebrough, Rotherham and Chesterfield.

OBITUARY

Alfred A. Green

Al Green, known the country over to electric railway men, died on Nov. 9, at Scranton, Pa., as a result of injuries sustained two weeks previously when he fell down a flight of stairs during one of his regular inspection trips. The remains were interred at Easton, Pa., on Nov. 12.

It has just been said that Al Green was known to electric railway men the country over. He was. But he was, perhaps, best known among such men in the East. For more than twenty years he has been connected with the Galena Signal Oil Company as its representative, except for a period of a few years some time ago when he was associated with the Columbia Machine & Malleable Iron Works.

To the problems of the Galena Company, lubricating experts, Mr. Green brought a well rounded career which covered a wide range of experience in electric railway maintenance and mechanical work. In that service he was one of the industry's pioneers, for he helped to build some of the early roads and then he wrote about his experience for publication, contributing to ELECTRIC RAILWAY JOURNAL a notable service of articles some time ago which stamped him as an expert in his line. Not only that, but Mr. Green contributed freely of his knowledge to the proceedings of the American Electric Railway Engineering Association.

Al Green had been making a name for himself long before 1904, but in that year he resigned as chief electrician and master mechanic of the Rochester Railway after ten years of service with the company. That date is important in the record of the career of the man, since it was destined to mark the turn in events which took him out of the operating end of the business and launched him on his career as lubricating expert.

Early in the year 1890 Mr. Green had gone to Rochester for the Brush Electric Company, Cleveland, to install the Short electric railway system there. On the completing of this work he remained there with the railway. Before that he had been superintendent of the testing department of the Brush Electric Company and previously superintendent of the Memphis Light & Power Company.

So it becomes evident that Mr. Green entered the field of the application of electricity to industry at its inception and that his active term of service covered the period from the little sputtering dynamos of the 80's to the massive machines of the present day. During all that time few men knew more than he about the part that proper lubrication plays in making high duty and high power machinery perform at the greatest mechanical efficiency. News of his death will come as a shock to a wide circle of acquaintances stretching across the country who had contact with Mr. Green over a period of more than a quarter of a century.

Daniel E. Lenahan

Daniel E. Lenahan, assistant superintendent of equipment of the Third Avenue Railway, New York, N. Y., died suddenly on Nov. 21. He began his railroad career at the Seventh Avenue and 50th Street carhouse of the Metropolitan Street Railway in 1898 where he served first in the capacity of car shifter and later as carhouse clerk. Then he became a foreman in the inspection department of the Manhattan Elevated Railroad and in 1905 was transferred to the subway lines of the Interborough Rapid Transit Company where he served first as foreman of car equipment, later as yardmaster and finally as superintendent of car inspection. Some years later he was again transferred to what is now known as the New York Railways, where he served first as assistant superintendent of equipment and later as general superintendent. His appointment as assistant superintendent of equipment of the Third Avenue Railway became effective June 1, 1927.

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Activity of Equipment Market Continues

Purchases of both track and line materials numerous. Illinois Central contemplates purchasing locomotives. Many buses ordered

ALTHOUGH no large projects have been announced during the past week, reports from a number of electric railways indicate that the market for material and supplies remains in good condition for this season of the year. Community Traction Company, Toledo, Ohio, continues its activities by placing orders for eighteen new motor coaches which will bring its bus fleet up to 106 coaches. All garage operations of this company will be centralized at a new $150,000 garage being built on the site of the Central Avenue carhouses. Both car and bus repair and maintenance operations will then be centralized in this location.

The Community Traction Company has also rehabilitated its Cherry Street line and overhauled these cars, installing additional motors and new control equipment. In view of the fact of increased earnings of this line, a contract has been let for the purchase of 120 motors with which 45 of the Peter Witt type cars will be equipped. Each car will then be equipped with four motors giving faster acceleration and smoother operation. This $150,000 rehabilitation program is to be completed about Jan. 1.

Track Materials

Five thousand hemlock ties have been ordered by the Ottawa Electric Railway, Ottawa, Ontario. The Capital Traction Company, Washington, D. C., has placed orders for 3,000 steel tie plates for use with 4-in. T-rail. This company has also ordered 100 Thermit rail welding portions at a cost of $441. The Grand Rapids Railroad, Grand Rapids, Mich., has placed orders for 25 kegs of $\frac{9}{16}$x5$\frac{1}{2}$-in. track bolts.

One hundred thousand granite paving blocks, 20,000 bags of cement, and 3,000 hemlock cross ties have been ordered by the Toronto Transportation Commission, Toronto, Ontario. The Dallas Railway & Terminal Company, Dallas, Tex., has ordered 5,000 creosoted pine ties and one car of mixed timbers and ties. Special work including ten mates and eight track switches has been ordered by the Virginia Electric & Power Company, Richmond, Va. This company has also ordered 500 track rail bonds.

To facilitate construction of the sewerage system to inclose the Des Peres River, the St. Louis Public Service Company, St. Louis, Mo., is making several changes in its track. The Oakland Avenue project calls for a temporary elevated loop structure of all steel construction resting on wood piles, describing a half circle around the old bridge from one shore to the other. In length it is about 150 ft., and connects with the tracks just above and below the bridge entrances. On Manchester Avenue, a short distance west of Oakland Avenue, a new bridge is to be constructed. This will be a permanent structure and will be approximately 150 ft. in length. The estimated cost of the two jobs is about $20,000.

Overhead Line Equipment

Several fairly large orders for line material have been placed. The Toronto Transportation Commission has ordered 61,000 ft. of No. 8 waterproof triple braid copper wire which will be required for its city extension consisting of 7 miles of double track.

Twenty-five thousand feet of $\frac{1}{4}$-in. galvanized strand and 25,000 ft. of $\frac{5}{16}$-in. galvanized strand have been ordered by the Louisville Railway, Louisville, Ky. Other line materials ordered by this company include 200 flexible approaches, 500 No. 00 clinch ears, 500 No. 000 clinch ears, 1,000 ft. of No. 0000 double braid weatherproof stranded copper wire, 500 spring lock hangers and miscellaneous electric switch repairs. The Virginia Electric & Power Company has ordered 100 trolley hangers and ten trolley cross-overs. Fifty splicing ears, 100 line hangers, eight overhead switches, and 200 crossarm pins have been ordered by the Grand Rapids Railroad.

Rolling Stock

The Illinois Central Railroad, Chicago, Ill., is inquiring for four electric switching locomotives. The Virginia Electric & Power Company is remodeling its cars on the Norfolk division, requiring eight type K-75-A controllers. This company has also purchased five Twin Coaches.

The Capital Traction Company, Washington, D. C., has placed orders for one hundred 31-in. solid wrought carbon steel car wheels costing $2,775 and forty 21-in. and forty 31-in. heat-treated solid wrought carbon steel car wheels at a cost of $2,260. Dallas Railway & Terminal Company has ordered one car of brake shoes.

The Capital District Transportation Company, controlled by the United Traction Company, Albany, N. Y., has applied to the Public Service Commission for authority to issue notes for the purchase of three Versare Electric Motor Buses for use in the operation of its Troy Bus Line. The Illinois Power Company, Springfield, Ill., has ordered two 21-passenger street car type Studebaker buses and two 22-passenger Seminole parlor observation Studebaker buses. Two Mack, four-cylinder, 21-passenger city type buses have been delivered to the Wichita Falls Traction Company, Wichita Falls, Tex. The Louisville Railway, Louisville, Ky., has placed orders for fourteen 21-passenger street car type Studebaker buses.

The Toronto Transportation Commission has ordered one model SH-100-hp. Walter snow fighter complete with cab, electric light, starter and pneumatic tires. This company has also ordered 21 trolley loading platform beacons, four supports, equipped with red globe and guards.

The British Columbia Electric Railway is going to expend approximately $270,000 in substation construction in the near future. The Louisville Railway is making extensive repairs to the steam end of a 6,000-kw. turbo-generator and is rewinding the armature of a 3,000-kw. turbo-generator. The Capital Traction Company has ordered a McKee gas-fired steam cleaning outfit consisting of a 4-hp. steam boiler, solution tank, water ejectors, automatic pump unit, etc., for cleaning bus motors and chassis.

Kansas City to Try Twin Coach Car

The Kansas City Public Service Company, Kansas City, Mo., will try out a new Twin Coach street car for a test period beginning in a few days. A Twin Coach bus has been on trial operation for several months. This new automotive-type, light-weight car is being awaited with interest by both the company and the public.

American Standards Association Formed

Unanimous approval by the 37 member bodies of the establishment of the American Standards Association to succeed the American Engineering Standards Committee, is announced by William J. Serrill, assistant general manager of the United Gas Improvement Company of Philadelphia. Mr. Serrill was chairman of the Standards Committee, and now becomes president of the American Standards Association. One of the most important results of the abandonment of the committee form of organization will, according to Mr. Serrill, be a much greater degree of participation by trade associations in the direction of the national industrial standardization movement.

One of the first acts of the association will be the organization of a board of directors composed of twelve industrial executives. This newly created board, which was established in recognition of the increasing part which executives are playing in the standardization movement, will control the general administration and policies of the association. The old main committee, made up of representatives of all the member bodies, now becomes the Standards Council, and in its hands will rest all matters connected with the adoption and approval of national standards.

The officers of the association are, in addition to Mr. Serrill: Vice-president, Cloyd Chapman; secretary, P. G. Agnew; and assistant secretary, F. J. Schlink. The advisory committee of Industrial Executives includes: J. A. Farrell, president of the U. S. Steel Corporation, chairman; George B. Cortelyou, president of the Consolidated

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Gas Company; John W. Lieb, senior vice-president of the New York Edison Company; L. F. Loree, president of the Delaware & Hudson Company; and Gerard Swope, president of the General Electric Company.

Largest Electric Railway Exports to Canada

Of the $106,692 worth of railway motors, electric locomotives, mining and industrial locomotives, starting and controlling equipment for electric railway and vehicle motors, railway signals, switches, etc., exported from the United States during the month of August, 1928, Canada received $63,811 worth of this equipment. The division of these exports to Canada is as follows: Electric locomotives, $20,000; starting and controlling equipment for electric railway and vehicle motors, $2,439; and railway signals, switches and attachments, $41,372.

Japan was the second largest receiver of American electric railway exports, receiving $12,119 worth of mining and industrial locomotives and $1,100 worth of starting and controlling equipment. The classification of the total exports from the United States consists of railway motors, $450; railway electric locomotives, $20,000; mining and industrial locomotives, $22,876; starting and controlling equipment for railway and vehicle motors, $10,269; railway signals, switches and attachments, $53,097.

Export Day at Power Show

As a result of the number of foreign visitors at the 1927 power show, the manufacturers of equipment who will exhibit at the Seventh National Exposition of Power and Mechanical Engineering at Grand Central Palace, New York, N. Y., Dec. 3 to 8, are showing a marked interest in the program that will be a feature of the exposition on Dec. 6, which will be Export Day.

The opening will take place at 2 p.m. Dec. 3. The Export Day program Thursday, Dec. 6, will be marked by the assembling of the members of the various foreign departments of the exhibitors in order to answer questions peculiar to the exporting of the various products. The foreign attendance last year brought representatives from 33 foreign countries and five insular possessions of the United States.

Requests have been received from a large number of foreign governments for invitations to the power show. Every exhibitor has been notified of the date of Export Day and special announcements in several languages will be posted at the entrances.

Included in the exhibits will be the latest type of equipment for the generation and distribution of power; for heating and ventilating buildings and factories; for handling material; for the control of temperature, pressure, volume and time; and machine shop equipment including metal and woodworking machines and tools.

METAL, COAL AND MATERIAL PRICES F.O.B. REFINERY

	Nov. 20, 1928
Metals—New York	
Copper electrolytic, cents per lb.	15.775
Copper wire, cents per lb.	17.875
Lead, cents per lb.	6.35
Zinc, cents per lb.	6.60
Tin, Straits, cents per lb.	51.
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.	$4.375
Somerset mine run, f.o.b. mines, net tons.	1.875
Pittsburgh mine run, Pittsburgh, net tons.	1.80
Franklin, Ill., screenings, Chicago, net tons.	1.30
Central, Ill., screenings, Chicago, net tons.	1.15
Kansas screenings, Kansas City, net tons.	1.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.5
Weatherproof wire base, N. Y., cents per lb.	18.625
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.8
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.25
Turpentine (bbl. lots), N. Y., per gal.	0.64

Seasonal Decline of Industrial Production

Consumption of electrical energy by manufacturing plants indicates that a seasonal downward trend in rate of production was witnessed during October. Rate of October operations were 1.9 per cent under September, but were 10.1 per cent above October, 1927. Textiles reported an increase in rate of operations of 7.6 per cent over September, and rolling mills and steel plants, 2.5 per cent. Operations in the automobile industry were 14 per cent under September, but were still 24 per cent over October, 1927. Lumber and its products continued on a low plane.

The New England states reported an increase in the rate of production of 4.7 per cent over 1927, the Middle Atlantic states 19.7 per cent, the North Central states 24.8 per cent, and the Western states 18.2 per cent. The Southern states reported operations 3.5 per cent under October last year.

The remaining months of the year will probably witness a gradual drop in rate of activity, though general operations may continue on a comparatively high plane, at least until the opening of spring.

TRADE NOTES

American Electric Switch Corporation, Minerva, Ohio, has placed a direct factory representative in the metropolitan district discontinuing the services of Holland & Monaghan, manufacturer's representatives. The New York office and warehouse is now located at 430 East 53rd Street with G. E. Lindstrom as manager.

National Flue Cleaner Company, Groveville, N. J., manufacturers of the National Soot Blower for return tubular boilers, announces the appointments of three new Ohio sales representatives; namely, Craun-Liebing Company, Cleveland, Dennis Engineering Company, Columbus, and the Bishop Engineering Company, Cincinnati. Other recent appointments are the Power Plant Efficiency Company of Indianapolis, Ind., and the Rathburn Company of El Paso, Tex.

Vernon B. King, formerly service manager at Toronto, Ontario, for the White Motor Company, Cleveland, Ohio, has been promoted to the position of export service manager. In his new capacity he will have charge of foreign truck and bus service throughout the world.

Timken Roller Bearing Company, Canton, Ohio, put into effect a program which will provide the necessary equipment for raising the company's present output of 175,000 bearings per day to over 200,000 per day. The program has necessitated the expenditure of about $6,000,000 during the current year and covers additions to both the steel mill and bearing factory.

C. F. Pease Company, Chicago, has moved its New York sales office and display room, formerly located in the Grand Central Terminal, New York City, to new quarters occupying the entire Seventh Floor, Ashforth Building, at 12 East 44th Street, New York City. An increase in sales personnel has also been made.

Harold C. Osman, secretary of the Nugent Steel Castings Company, Chicago, Ill., and heretofore in charge of sales for that company, has been appointed Works Manager.

Rudd H. Bender, formerly with the Brown Body Company, has joined the Bender Body Company, Cleveland, Ohio, as sales representative.

ADVERTISING LITERATURE

Wagner Electric Corporation, St. Louis, Mo., has just issued a new bulletin describing Wagner large RA single-phase repulsion-induction motors. It covers such subjects as type of single-phase motors, history of repulsion-induction motors, operating principles, sleeve and ball bearing construction, ventilation, and construction features of stator, end plate, rotor and rocker arm. The bulletin is illustrated with numerous drawings and photographs.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has just released two publications on electric railway equipment. "High-Speed Motors and W-N Drive—D.M.F. 5126" contains complete construction details of this new double-reduction method of street car drive. "Electric Freight Haulage Increases Earnings—D.M.F. 5113" is a discussion of the possibilities for freight service on electric railways and some facts about Westinghouse equipment available for such service.

American Electric Switch Corporation, Minerva, Ohio, has issued a new catalog covering its line of safety switches, meter switches and fuse panels.

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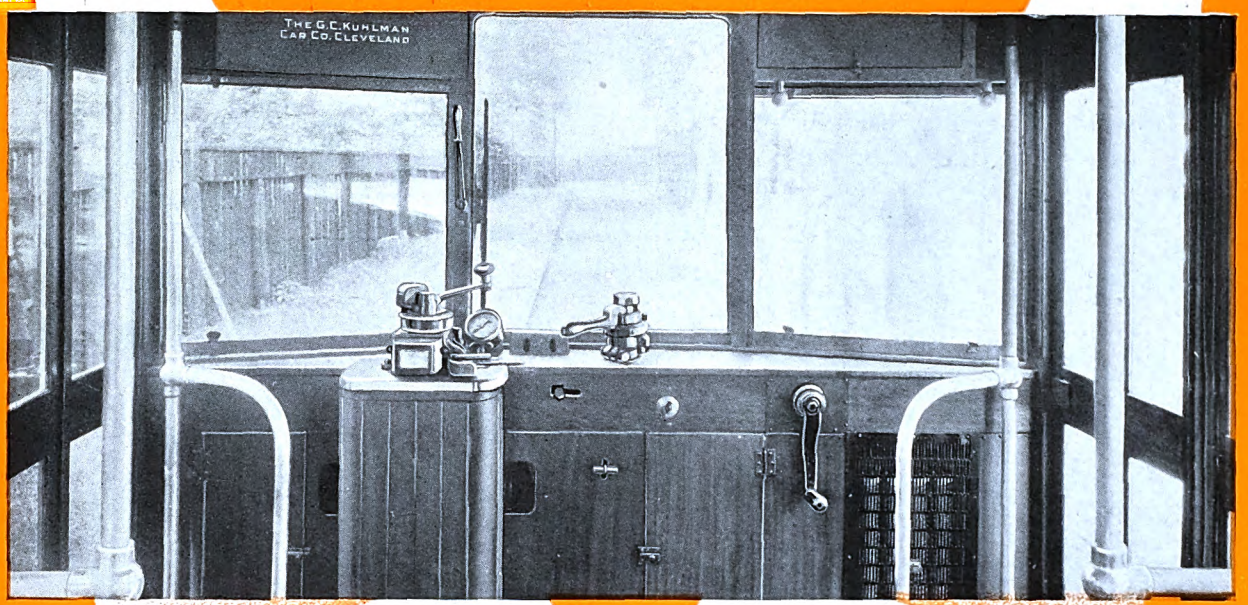

Practical Simplicity

The Electric Railway Industry agrees that the Fairmont Car is distinctly practical and modern. There are no radical details of design or equipment to present a maintenance problem.

The center vestibule plate glass window, for example, is stationary and fitted in a rubber channel without a sash frame. Each of the other vestibule windows can be lowered to any desired height. The operating equipment in the vestibule is concealed in cabinets which harmonize with the mahogany finish of the interior. Other simplified features are the bell-cord type of buzzer, improved destination signs and easily operated sash fixtures.

The Fairmont Car was designed to attract patronage but the means of reducing operating and maintenance costs were also carefully considered. It is the product of close cooperation between operator and manufacturer.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

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BRILL MODERN CARS

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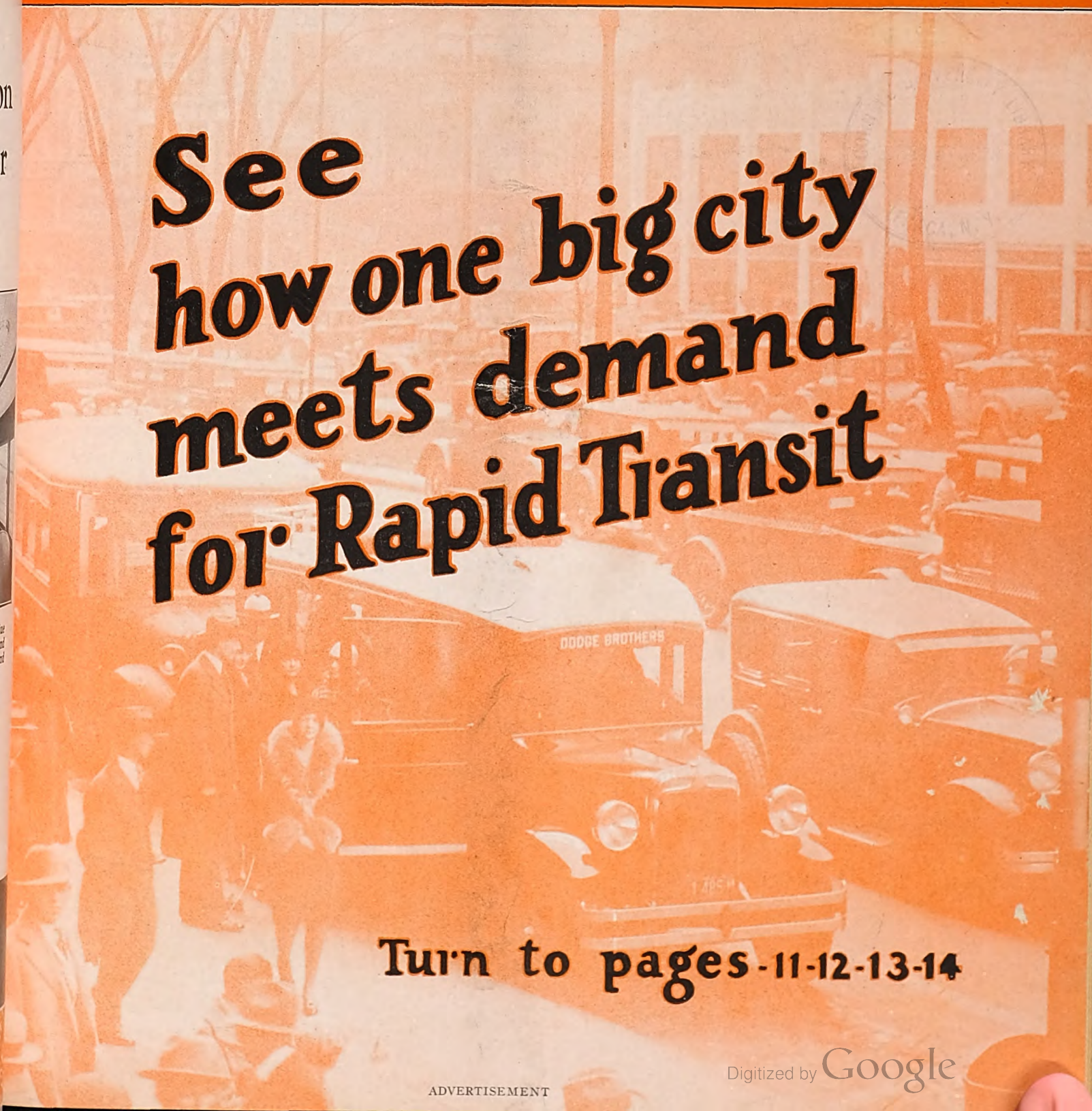
ELECTRIC RAILWAY JOURNAL

aw-Hill Publishing Company, Inc. DECEMBER 1, 1928 Twenty Cents Per Copy



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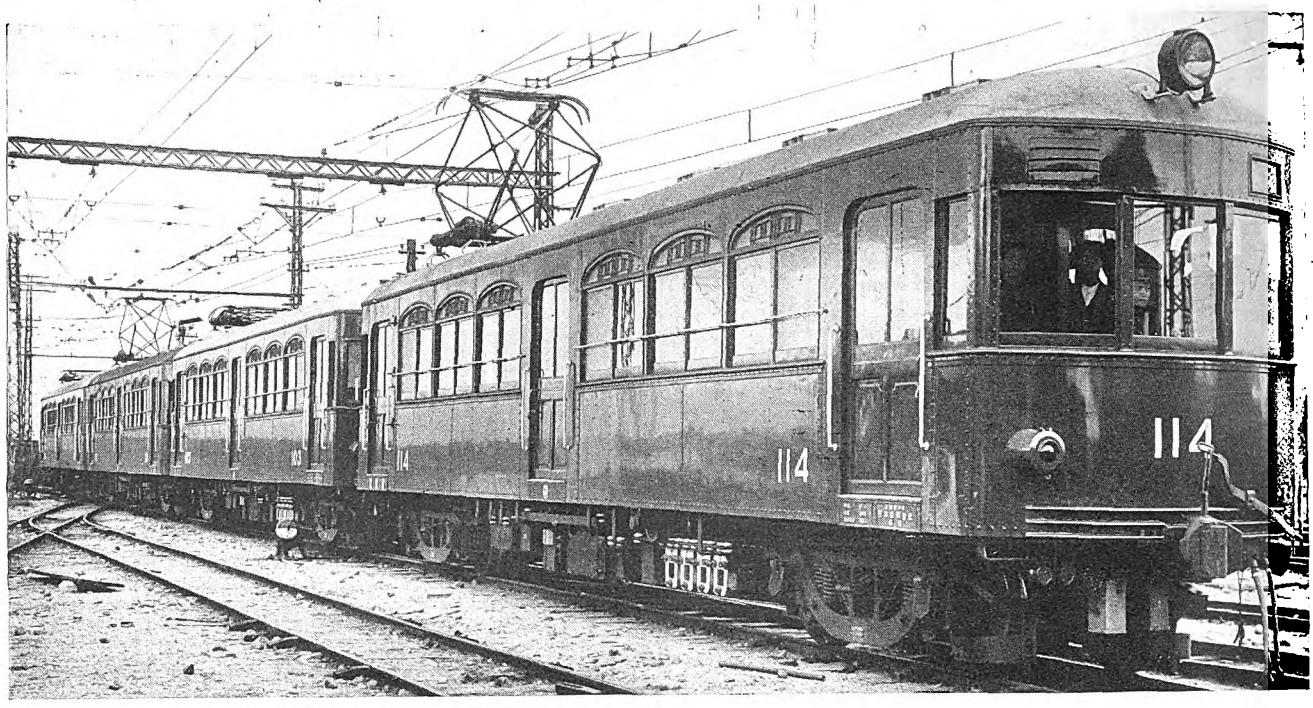

Progressive Japan Expands Electrified Transportation Service

OSAKA, the industrial center and second largest city in the Empire of Japan and the seventh largest city in the world, may well be proud of her modern electric railway system.

The rolling stock of the new subway, transporting Osaka's millions of citizens, is equipped with powerful Westinghouse motors and control. Fifty motor and thirty-five trail cars, and a 30-ton locomotive recently have been placed in operation. Schedules comparable with the best in any metropolitan center of the world will be afforded this great industrial city of the Orient.

Westinghouse is proud to have contributed to this important engineering transportation achievement.

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA 1928

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

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Electric Railway Journal

Consolidation of
Street Railway Journal and Electric Railway Review

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CHARLES GORDON, *Editor*

Louis F. Stoll, *Publishing Director*

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A Municipal Ownership Fiasco

SOMETHING is wrong with Seattle's Municipal Railway. Something has been wrong with it ever since the city took over the lines of the Puget Sound Traction, Light & Power Company on March 31, 1919, paying for it in twenty-year bonds bearing 5 per cent interest. Instead of taking the utility out of politics the transfer from the private company put the property into the center of that hazardous arena. As a political issue the question of the future of the road has made and unmade Mayors. Each succeeding incumbent has promised to do something about it, but none of them has done so. Fortunately, however, civil service has kept the railway out of the clutches of the patronage seeker.

The Seattle system has been operated at a loss each year it has been under municipal ownership. So acute did the situation become last spring that Councilman Erickson, veteran municipal ownership advocate, declared the railway to be hopelessly insolvent. He wanted to have the general fund contribute to the expenses of the railway, on the ground that it is an asset to the entire city. As matters stand now the system must be self-sustaining. Not only that but the purchase price must be amortized out of earnings. That is where the rub comes. Again Seattle is promised that something will be done about it. To that end both the present Mayor and the city superintendent of utilities would rehabilitate the system with the proceeds of a bond issue and reorganize and develop the property along modern rapid transit lines. An alternative suggestion is that the railways be leased to private operators with a franchise granted to them for long-term taxicab rights, the two services to be combined into one transportation system. As indicated elsewhere in this issue, it appears likely now that these rival programs will be submitted to a vote of the people next March. Such are the past political hazards, however, that there is no certainty that by the time March rolls around this program will then appear propitious.

This is not the first time that something needed to be done about the matter. But conditions would appear to have reached a crisis. The city's reputation has not only been hurt, but the Municipal Railway is now from $500,000 to $600,000 behind in its obligations without taking into consideration the inadequacy of the amounts that have been set aside annually for depreciation. Moreover, the city is losing approximately $525,000 a year that it would receive in the form of taxes upon its property and other payments if the lines were owned by a private company.

The full Seattle story is a long one of which this is merely a sketchy outline. There appears to be no adequate reason for this lack of achievement on the part of the city, for since 1923 the Municipal Railway has been on a rate of fare that provides for the payment of 10 cents in cash with an 8¼-cent token fare. The record presented here and the accounts which have appeared in Electric Railway Journal from time to time substantiate the truth of the statement that municipal ownership of street railways in Seattle has proved a fiasco.

Suggestions for Improving Convention Attendance

WHILE the American Electric Railway Association convention is a thing of the past, it has not passed so far into the background but that it offers suggestions for improvements next year, particularly in the matter of attendance at affiliated association meetings. It was noticeable in some of the meetings of the several affiliated associations, that the number of delegates who attended all of the sessions of their particular group was relatively small; and while the attendance at the opening sessions was fair, it was by no means what it should have been. But, at the final sessions of some of the affiliated associations, there was hardly more than a corporal's guard.

Many delegates were permitted by their managements to spend only two or three days at the convention. When it is considered that at least a part of the time available must be devoted to an inspection of the exhibits, it will be readily apparent that the time for attendance at meetings becomes very limited indeed. It seems quite obvious that full value from the investment made in sending men to the convention can be derived only by allowing these men sufficient time to attend all of the meetings of their respective associations.

There is, however, another side to this question. It was particularly noticeable at the last convention that a number of managements sent unusually large delegations, which in some instances included all of the men in responsible supervisory positions on their properties. Obviously, under these circumstances it became necessary to limit the time of attendance of each man, for it is an unusual property indeed which can permit all of its principal supervisory officials to be absent at one time. Faced with the alternative of limiting the number of departmental executives who go to the convention, or staggering the time of attendance so that all responsible officials are not away from a property simultaneously, there is much to be said for the latter policy.

There are, therefore, two considerations regarding convention attendance. It is highly desirable, in fact essential, that full attendance of important committee members and officers be assured at affiliated association meetings. It is likewise desirable to permit the maximum possible number of supervisory officials to derive the benefits of convention attendance. It is suggested, therefore, that in apportioning time among delegates preference be given to those men who are actively engaged in committee work or in directing the affairs of their respective associations as officers. Perhaps this would put committee activity at a premium. If so, it would be a healthy condition, for there are, unfortunately, too

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many responsible departmental executives who give little attention to committee work which is the foundation of association activity and progress.

An Exhibit That Stimulates Interest

LIVELY interest taken by both public and railway men in the exhibit staged by the Interborough Rapid Transit Company in New York during October suggests the desirability of such a temporary exhibit in other cities, when the occasion arises. The ordinary citizen knows very little about the nature of electric car equipment other than that electricity is the propelling force, and that it is taken from an overhead wire and is admitted to unseen motors by a controller on the front platform. The public cannot fail to be impressed by an exhibit which gives an opportunity to see the complicated nature and rugged appearance of the actual transportation equipment, as well as the ingenuity which has been exercised in devising the various parts.

For employees the benefit, of course, is even greater, because very few employees other than those whose work requires them to understand the equipment know much about its actual design. The railway accountant, for instance, should do better work if he has a knowledge of what railway apparatus looks like and does. Even trainmen can get clearer ideas of much of the apparatus under the car than they can from a school car only.

From every point of view the expense of an exhibit of this kind seems more than justified. The foundation of good public and employee relations is interest in the company's operations. There seems to be no better way of stimulating this interest in equipment and methods than that adopted by the I. R. T. in the exhibit which is described elsewhere in this issue.

Canadian Railways Show Increased Earnings

STUDENTS of monthly traffic statistics of electric railways have been impressed for some time with the good record maintained by the Canadian properties. During 1927 the average increase in revenue passengers compared with the previous year of the Canadian companies reporting to the American Electric Railway Association was 3.48 per cent, and the monthly average increase of the same companies during the first ten months of 1928 was 4.63 per cent. The most striking feature of these figures is that during the same two periods, 1927 and the first ten months of 1928, every one of the six sections into which the United States is divided for the purpose of classifying traffic statistics, showed a decrease in the number of revenue passengers.

The American Association statistics are supplemented and confirmed by figures compiled by the Canadian Electric Railway Association. These data extend back to 1913 or earlier and show that while present electric railway traffic in Canada does not quite reach the total of 1920 (the record for all time in that country), there has been a constant gain during the past three years, and in 1927 the 1920 figure was nearly attained. This has been accomplished despite steady increases in automobile registrations in Canada. Even more satisfactory gains are shown in the figures for Canadian passenger revenue and net income. Finally, there has been very little change in the rate of growth of investment in Canadian electric railways for 27 years, except for a brief set back in 1920.

The reasons for this better showing of the Canadian properties compared with those on this side of the border are difficult to discover. It cannot be because of a more satisfactory fare situation, since there has been no material increase in city fares in Canada since 1922, yet the gain in both gross and net during the past three years has been continuous. The present Canadian city fare is now only 140 per cent of the pre-war level. There is probably less competition from private automobiles in Canada than in the United States, although the automobile registration in Canada now is about one to every ten inhabitants, approximately the same as our figures of six or seven years ago. Undoubtedly the longer winters in Canada have had something to do with the continuous patronage of the electric railways, but whatever the cause, the properties in our great neighbor to the north ought to be congratulated.

Making a New Shop Pay for Itself in Three Years

ANTICIPATED economies amounting to $200,000 a year provide the principal motive that led the Philadelphia Rapid Transit Company to build its new $500,000 bus maintenance shop. With 570 gasoline-electric buses operating more than 20,000,000 miles a year, the company was in a position to realize the utmost in maintenance savings by having a central repair shop where all maintenance work can be co-ordinated. The centralized plan eliminates the need for more than 10 per cent spare vehicles, it reduces the amount of spare parts and maintenance stock that must be carried and it eliminates duplication of tools and shop forces that must result necessarily where the work is done at several points.

In the arrangement of the shop particular attention was given to routing the work and interlocking the various repair operations, so that a relatively small number of men employed steadily can make repairs. In deciding on the various departments the railway took a leaf from its book of experience gained in maintaining electric cars. Departments for electrical repairs, machine shop, sheet metal shop, wood-working mill, blacksmith shop, paint shop and tool room are all standard departments for electric car maintenance. Only by the addition of a department for overhauling bus engines has a new type of maintenance work been introduced that requires specialized methods.

Tools are located so as to prevent crowding and give plenty of room for orderly movement of material. Units are arranged so as to give workmen the advantage of good light. Overhead cranes and hoists provide for efficient handling. Lathes are arranged along the windows at one side of the shop and are staggered diagonally to facilitate the handling of bar stock and to prevent work on one machine interfering with that on another.

The fact that bus repair work often requires greater precision and closer fits than are used in electric car maintenance has been recognized by providing a complete assortment of precision instruments and special tools. Micrometers, gages, test blocks, and even a Brinell hardness tester and a scleroscope are included in the tool-room equipment.

More economical maintenance will result from having up-to-date tools for performing the various classes of work and from having experienced men skilled in the particular operations to carry it out. Convenient storage of material will reduce the time needed for repairs and the stock of spare parts can be kept low.

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More Evidence of Modern Transportation Merchandising

ADDITIONAL evidence of the disposition of those supplying public transportation to make their service more attractive is furnished by the announcement just made by the New York Central and the West Shore Railroads regarding changes in commuters' tickets and in the rates for excursion tickets. Thus, for use in the coming year, the New York Central and the West Shore Railroads have devised a new form of unlimited commutation ticket, resembling the old-fashioned pass card. It will require no punching, and can be bought for as many months ahead as the purchaser wishes, at the regular monthly rate. At the same time there will be offered a schedule of low-rate excursion tickets to the city and return, to be used at other than rush hours on the stamped date only. This, of course, places emphasis on the value to the companies of the off-peak riding, a type of patronage many electric railways have long since done their best to encourage.

It is true that the systems on which these "innovations" are to be introduced are steam lines, but the proposals now made embody principles which long since were accepted by the electric railways, particularly the principle of adopting changes that lighten the work of the conductor and make the service more attractive to the passenger. Apparently the roads have put aside entirely the idea that excessive use will be made of the cards. As the New York *World* sees it, "no holder is likely to put in time traveling back and forth merely for the fun of riding."

So concerned in the past have some transportation companies been with this possibility of abuse of modified fare plans, that they have permitted the likelihood of the abuse to obscure their view of the benefits of such plans. The announcement of the adoption of the new railroad commutation cards is particularly gratifying, since it carries additional evidence of the alertness of railway managements to the modern merchandising spirit of catering to the customer.

Public Benefits From Crossing Protection

UNDER the terms of an executive ruling adopted by the Pennsylvania Public Service Commission last year, it has been made possible for the State Highway Department to share half of the expense of the installation of flashing light signals actuated by train movement for the protection of state highway crossings. As the result of this ruling, as pointed out in the report of the committee on safety of railroad operation of the National Association of Railroad and Utilities Commissioners recently presented at the annual meeting of that body in New Orleans, hundreds of applications have been made for protection of crossings under this ruling. In addition to the protection at the crossing itself, provision was also made for the installation of warning signs along the highway under the same conditions, i.e., that the railway company and the highway department jointly bear the expense.

Obviously, this general recognition of the public's part in creating the risk at highway crossings, and of the public benefits resulting from protection or grade separation, is a step forward in the protection of human safety and the conservation of life. The report goes a step further in pointing out that since the advent of the automobile in ever-increasing numbers, to the extent that this transportation agency has now become a serious competitor with rail carriers, the owner of the motor vehicle in all equity becomes a unit of assessment for his proportionate share of the cost of separating or eliminating or protecting grade crossings. The report proceeds to the ultimate conclusion that if the costs of separation, elimination and protection of crossings are to be assessed upon those benefited in proportion to the benefits conferred, that federal and state appropriations should be made therefor, so that the entire burden of cost may not rest upon the carriers and the local municipalities within whose limits the particular grade crossing to be protected may exist.

It may be a nice problem indeed to determine the fair allocation of benefits from a grade crossing project between a local community and the public at large. But there is no question but that the public does have a large share in the benefits of crossing protection or separation, and that the policy outlined in the report is constructive and forward looking.

Saying It in 870,000 Words

IN DIRECTING that the Interborough case be reargued before it on Jan. 14, the Supreme Court said bluntly that the briefs "shall be compact, logically arranged with proper headings, concise and free from burdensome, irrelevant and immaterial matter." Washington observers regard this as one of the most severe rebukes that the court has ever administered to attorneys appearing before it. Counsel for the city should bear the brunt of this rebuke, it is felt, because they were the aggressors in the case. According to the order of the court, the decision was due to the voluminous manner with which the case was presented. It is believed, however, that confusion arising out of the injection of too much politics into the case is responsible also.

Those familiar with practice in the United States Supreme Court have stated that the reargument order in this case is the first of its kind in which it has been specified that the former briefs cannot be used. In the statement of the case to the court the city and the Transit Commission filed seven briefs with a total of 992 pages, and the transit companies filed nine briefs with a total of 810 pages. Because of the numerous briefs and appendices, much confusion resulted during the hearing of the former case before the court due to the inability of counsel to obtain prompt reference to statutes and other matter.

By this act, the court has focused attention on a matter that has long called for correction. Time and again, particularly in valuation cases, has it seemed that court and commission proceedings were drawn out beyond all need and the real issue obfuscated in a mass of words. In the New York case many important points are involved, but so far as the companies are concerned, the one central question involved, aside from the details and ramifications of the case, appears to be: Does the public service commission law of New York apply to the rapid transit railways and do the provisions of that law under the statutes of New York enter into and form a part of the fare stipulations in the contracts? If this correctly presents the issue, then the record, particularly that of the city, certainly appears to have been unduly burdensome. The desire of litigants is perfectly human not to want to overlook the presentation of any facts that may tend to strengthen their contentions, but a presentation that is estimated to contain 878,000 words can hardly escape the characterization of being verbose.

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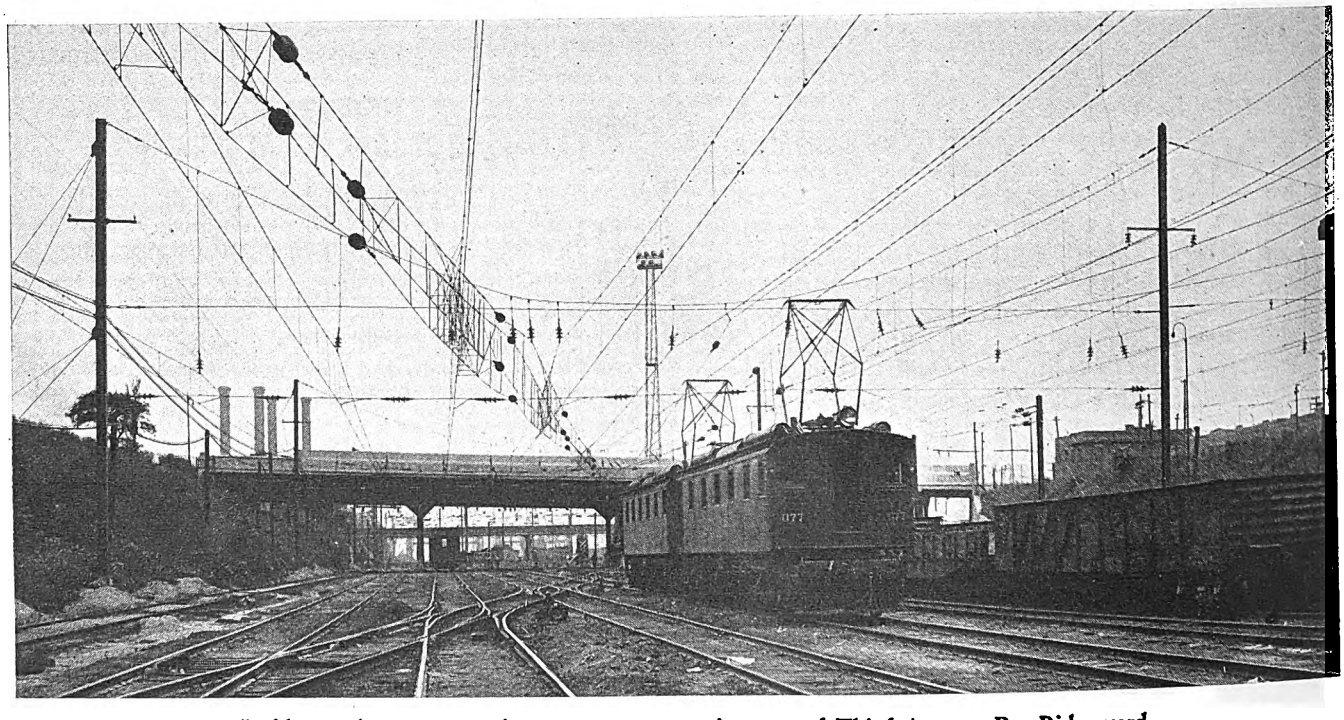
Bay Ridge Electrification Completed

Extension of single-phase system provides better freight connection between New Haven and Pennsylvania Railroads. Financial returns on electrical equipment of New York Connecting Railroad justify its cost



Ladder track catenary and cross-span construction east of Third Avenue, Bay Ridge yard

IN 1927, the freight line of the Long Island Railroad and New York Connecting Railroad from Port Morris to Bay Ridge was electrified, electric operation commencing in July of that year. This line carries two services. One is a through freight service operated by the New York, New Haven & Hartford Railroad, and the other a local freight and switching service operated by the Long Island Railroad.

The through service conducted on this railway is that between New Haven, Conn., and Bay Ridge Yard on New York Bay, where freight is handled by car floats across the bay, to and from Greenville, N. J. (the eastern freight terminal of the Pennsylvania Railroad). The Long Island company's service consists of local freight and switching service between Bay Ridge and Fresh Pond, and, at times, interchange of freight at Bay Ridge with its connections.

The so-called Kaufman act of the state of New York (later declared unconstitutional) prescribed the electrification of all railroads within the limits of the city of New York and adjacent counties. But, regardless of this, the returns, both direct and indirect, justified the cost, together with the advantages in eliminating smoke difficulties in the long tunnel under East New York.

A portion of this line had previously been electrified in connection with the inauguration in 1918 of through passenger service between Washington and points in New England, via the Pennsylvania and the New Haven lines over the Hell Gate Bridge. This portion included the New Haven's tracks at Port Morris, just east of the Hell Gate Bridge, and also two of the New York Connecting Railroad Company's tracks from Port Morris over the Hell Gate Bridge through Bowery Bay Junction (where the passenger line branches) to Sunnyside yard of the Pennsylvania Railroad, where connection is made to the tunnels under the East River into New York City. The accompanying map of the district shows that the New York Connecting Railroad section terminates at Fresh Pond Junction, the Long Island Railroad tracks commencing at this point and continuing south and westward through the borough of Brooklyn to Bay Ridge Yard. Adjoining the Bay Ridge Yard of the Long Island Railroad is the freight terminal of the U. S. Army Base, a portion of which was electrified at the same time.

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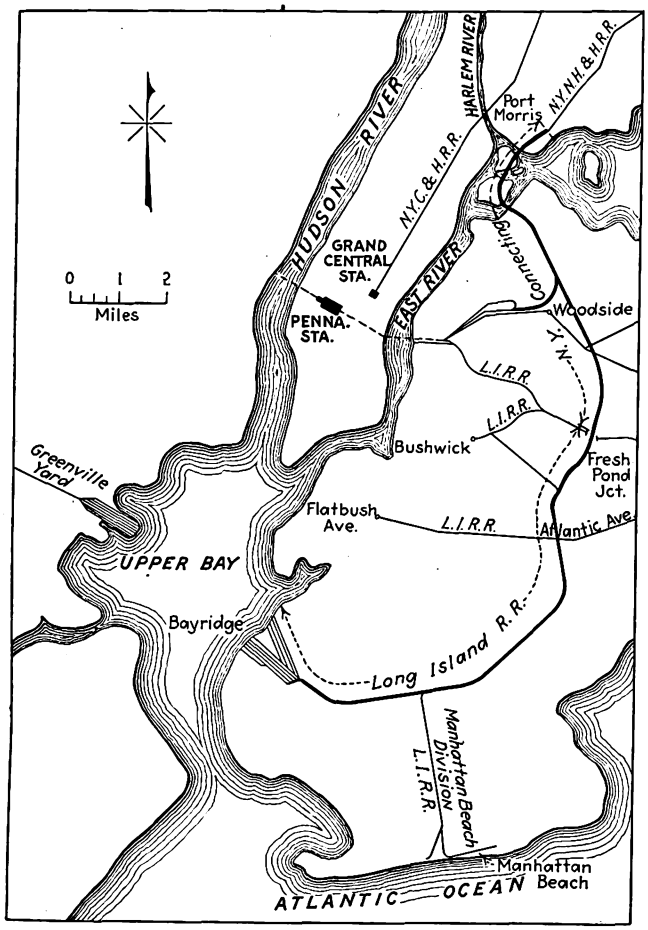


Track recently electrified as well as track between Port Morris and Sunnyside yards on which electric passenger service was begun some years ago

The electric system adopted was the 11,000-volt overhead trolley, thus permitting through electric operation of freight trains from New Haven, Conn., to Bay Ridge, N. Y., a distance of some 86 miles.

The total track mileage electrified under this recent electrification is as follows:

Road	Route Miles	Track-Miles
New York Connecting Railroad	8.14	14.00
Long Island Railroad	11.56	80.80
U. S. Army Base	.....	2.50
Total	19.70	97.30

Between Fresh Pond and Manhattan Beach Junction there are four tracks for a distance of 7 miles. The balance of the line is two track. Forty-eight industrial sidings were also electrified at the same time.

The general alignment is a fairly simple one, the average curvature being on the order of 1 deg. with a maximum of 4 deg. 24 min. Grades are fairly heavy, the maximum being 1.2 per cent at the eastern approach to the Hell Gate Bridge.

The road traverses a thickly settled portion of the boroughs of Brooklyn and Queens, and is crossed by 50 highway bridges. There are also two tunnels, one 3,500 ft. long and the other 500 ft. long. In and under many of these the overhead clearance was very limited.

For some ten years freight service has been operated between New Haven and Bay Ridge over the Hell Gate Bridge, but not as a through run on the section from Bay Ridge to Oak Point yards, where steam locomotives were used. The trains were limited to only 2,150 tons, due to limited capacity of the steam locomotives. At Oak Point yard they were filled out to 3,800 tons for handling to New Haven, Conn., by double-headed electric locomotives. Under electric operation 1,600-ton trains (32 cars) for single locomotive and 3,200-ton trains (64 cars) for double locomotive are being operated, east-bound, direct from Bay Ridge to Cedar Hill yard (New Haven), thus eliminating the stopping and filling out at Oak Point.

The total number of through trains east-bound, used as a basis of estimate, was 600 cars, consisting of:

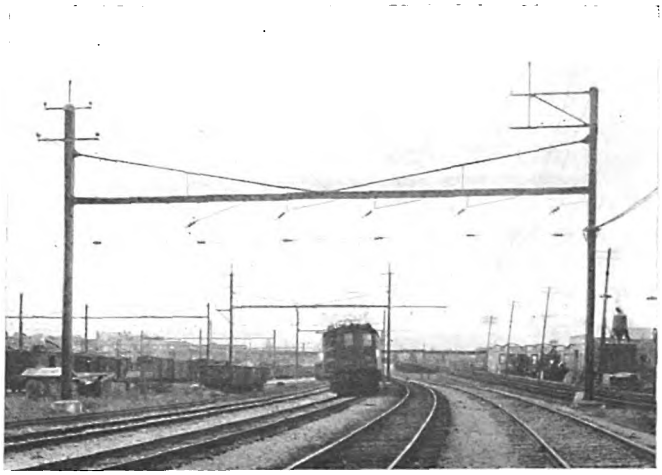
Seven 3,800 ton trains per 24 hours (double-headed).
One 1,750 ton train per 24 hours (double-headed).
Eight trains total per 24 hours.

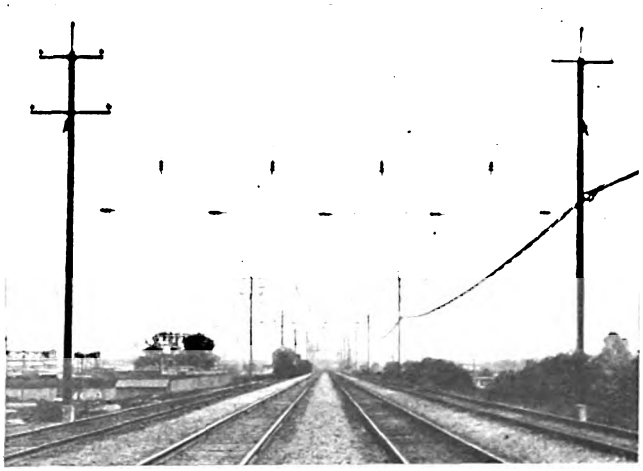
The movement west-bound from Oak Point to Bay Ridge was also taken as 600 cars handled in eight trains of 75 cars each.

The characteristics of two New Haven 076-0111 type electric freight locomotives compared with the heaviest (J-2) steam locomotives are as follows:

COMPARATIVE TRACTIVE POWER OF STEAM AND ELECTRIC LOCOMOTIVES

	Steam	Two Electrics	Ratio
Weight on drivers, lb	240,000	357,600	1.37
Tractive effort, starting, lb	58,000	100,000	1.71
Tractive effort, continuous rating, lb	.....	34,200	....
Tractive effort, one-hour rating, lb	.....	49,600	....
Tonnage rating from Oak Point to Cedar Hill, tons	.....	3,800	....
Tonnage rating from Bay Ridge to Oak Point, tons, east	2,150	3,200	1.43
west	.....	2,000	0.99





At left, cross-beam bridge construction on curve. At right, cross-span construction with H columns on four-track tangent

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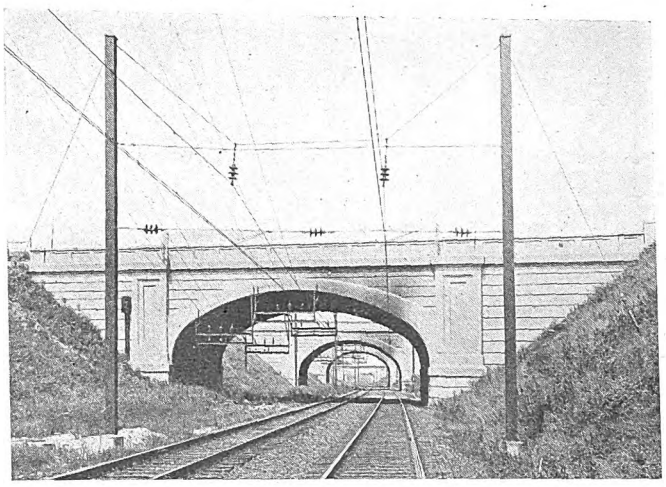
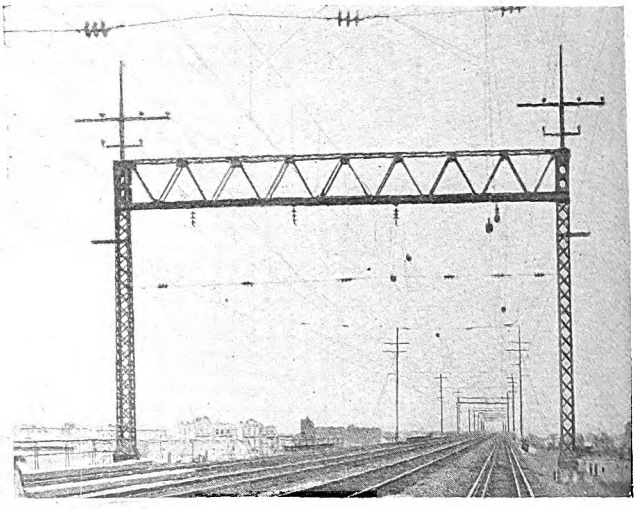


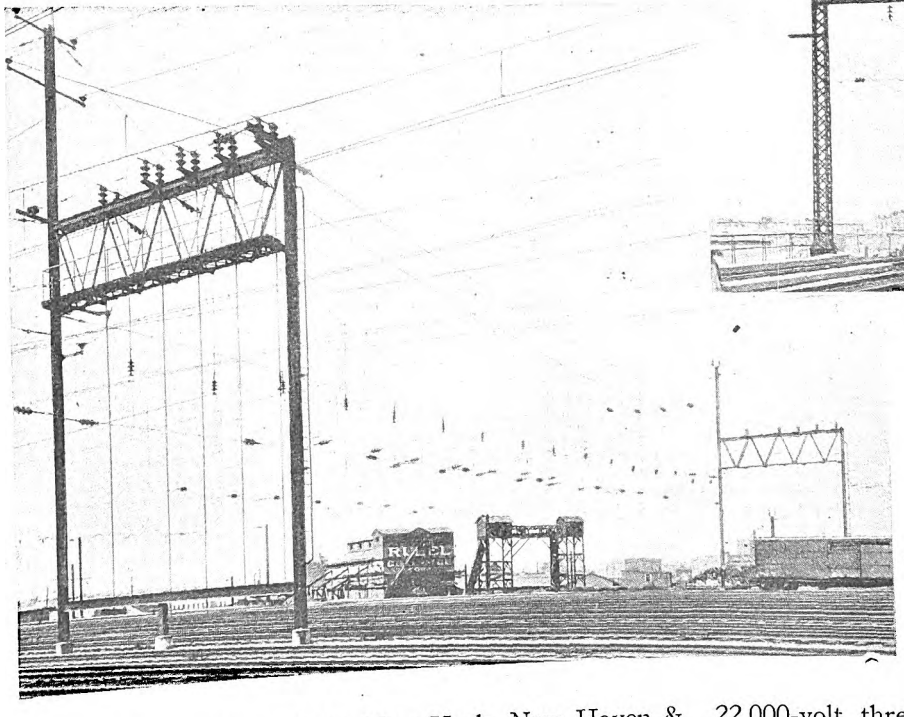
There are many highway bridges on the new line. This view shows the method of supporting the feeders under these bridges

The 22,000-volt power is delivered to six outdoor transformer stations along the right-of-way, as follows:

Location	Kva.
Bungay Street (Bronx)	3,000
Bowery Bay (Queens)	3,000
Fresh Pond (Queens)	3,000
New Lots (Brooklyn)	3,000
Manhattan Beach Junction (Brooklyn)	3,000
Bay. Ridge (Brooklyn)	3,000

The transformers are auto type, outdoor and self-cooling.





At left, sectionalizing switching structure and cross-span details. At right, anchor bridge on four-track tangent

Through operation of the New York, New Haven & Hartford Railroad's a.c. freight locomotives was a prerequisite. These locomotives are not equipped with a.c.-d.c. control, as are the company's passenger locomotives, which have to operate on the New York Central's third rail into Grand Central Station. This, together with its general suitability for this class of service, led to the adoption of the a.c. single-phase trolley system, this also being the standard of the Pennsylvania Railroad which controls the Long Island Railroad. The earlier Long Island electric operation, largely multiple-unit passenger service, is by the d.c. third-rail system.

Power is obtained from the New York, New Haven & Hartford Railroad's power system, which consists of a generating station at Cos Cob, supplemented by purchased power delivered at West Farms in the borough of Bronx, New York City, and Devon and New Haven in Connecticut. This power supply is further supplemented by an emergency supply from a frequency changer station at East New York, capable of delivering 5,000 kw. to or from the Long Island Railroad's power system. This frequency changer set is also operated as a synchronous condenser during heavy load periods to improve the power factor and trolley voltage.

The electrical apparatus was supplied by the Westinghouse Electric & Manufacturing Company, the Pittsburgh Transformer Company, the Electric Power Equipment Corporation and many others.

Distribution

The distribution system is the same as that of the New Haven, which is a 22,000-volt, three-wire system, the trolleys being 11,000 volts, the feeders 11,000 volts of the opposite polarity and the track return the neutral point.

Four No. 0000 copper conductors are carried as feeders on pin insulators on the catenary poles in the open construction. As has already been noted, there are numerous highway bridges of very limited clearance over the tracks, requiring that the feeders be carried on tall poles so as to span over the highways.

On main tracks both rails have joints bonded. The gas flame welded bond is used throughout, welded to the head of the rail.

Catenary Construction

Rolled steel H columns are used for poles throughout the electrification. Two types of foundations are used for these poles, the predominating one being that used for poles not subjected to curve pull from the wires, and also for poles subjected to curve pull but which could be guyed. For this foundation a cylindrical hole was dug in the ground about 3 ft. in diameter and from 6 ft. to 10 ft. deep. The hole was then lined with a length of corrugated steel culvert pipe. A shallow layer of dry concrete mix was then laid at the bottom of the hole,

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and on top of this was placed a loose steel plate to act as a base for the pole. These plates were all set carefully to correct elevation from the top of the rail and bore guiding angles for placing the pole at correct distance from track. This method permitted the opening up of a quantity of holes prior to the setting of the poles without danger of cave-ins. At a convenient later time the poles were delivered and erected by work train and derrick, then wedged in place in the culvert pipes. A second work train followed, equipped with water tanks and concrete mixer, and the hole was filled with concrete.

	One Motive Power Unit
Wheel arrangement	0-6-0
Rigid wheelbase, ft., in.	12-8
Diameter of drivers, in.	62
Length over coupler faces, ft., in.	63-0½
Total weight, and weight on drivers, lb.	158,000
Maximum tractive effort, lb.	50,000
Motors, three	190 hp., 235 volts, a.c. series-connected type

Self-supporting poles on curves have the usual square concrete foundations with forms built in place. The signal bridge foundations are of the same type.

Cross catenary is used generally for the support of the messenger and trolley wires. On curves, poles are guyed where possible, a precast reinforced concrete anchor being used with guys of extra high strength steel strand. Where it is impossible to use guys, the beam type of bridge is used, consisting of H column poles, already mentioned, with cross beam of H section with sag braces of angles.

The longitudinal catenary system consists of a phono-electric bronze strand messenger, from which are suspended phono-electric round rod hangers. These hangers support a No. 0000 copper auxiliary messenger to which the No. 0000 bronze contact trolley is fastened by bronze clips and bolts. The cross catenary is also bronze strand with bronze hangers. The entire catenary system, therefore, is of non-corrodible materials.

Character of Construction

Despite the shortness of the route (20 miles), it will be noticed that the track mileage is more than 97 miles. Included in the mileage are 4 interlockings, 48 industrial sidings and 11 yards of from 5 to 30 tracks. It will, therefore, be seen that the amount of special work was very high, making the construction work considerably more difficult than a mere tally of the track mileage would indicate. Construction work started April 1, 1926, and partial electric operation commenced between New Lots and Fresh Pond in April, 1927. Through service between Port Morris and Bay Ridge commenced June 29, 1927.

Switching Locomotives

As before stated, the through freight service of the New York, New Haven & Hartford Railroad is handled by the company's standard electric locomotives, the characteristics of which have already been given.

The Long Island Railroad's switching and transfer service is handled by fourteen motive power units designed to be used either singly or coupled together and operated as one locomotive. These locomotives were designed by the motive power department of the Pennsylvania Railroad, and the mechanical parts were built at that company's shops in Altoona, Pa. The electrical apparatus was supplied by the Westinghouse Electric & Manufacturing Company.

The main characteristics of these locomotives are as given in the table in the preceding column.

Design and Construction

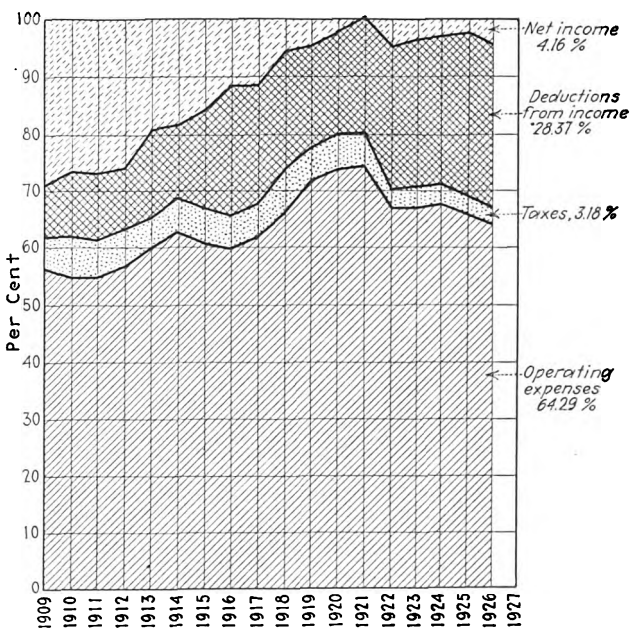
The design and installation of the complete system was done by Gibbs & Hill, Inc., consulting engineers for the railroad, in collaboration with the railroad's operating officials and engineers.

Progress Indicated from Canadian Statistics

Electric railway revenues have shown continuous increase from 1900 to 1927. Capital investment also increases

LAST year the Canadian Electric Railway Association compiled and published some interesting statistics on electric railways in Canada. This year the figures and charts have been brought up to date and new ones added.

The table below shows passenger revenue in 1926 was nearly nine times that in 1900, and that the revenue per



Distribution of total revenue of Canadian electric railways, 1909 to 1926

mile of single track was 2.26 times as great as in 1900. The increase in operating expenses per mile of single track was even greater than the increase in revenue, being

TABLE SHOWING PASSENGER REVENUE AND TOTAL OPERATING EXPENSES. CANADIAN ELECTRIC RAILWAYS

	Total Passenger Revenue	Pass. Rev. per Mile of Single Track	Oper. Exp. per Mile of Single Track
1900	$5,529,687	$8,192	$5,237
1905	8,932,914	11,265	7,463
1910	16,125,994	11,660	7,319
1915	25,579,689	12,211	8,622
1920	43,279,009	17,832	15,757
1925	45,185,402	17,616	13,811
1926	46,810,403	18,509	14,414

2.75 times as great as its 1900 level. A reduction in operating expenses per mile of track between 1920 and 1925 can be attributed largely to the introduction of one-man cars. The total passenger revenue of the Canadian

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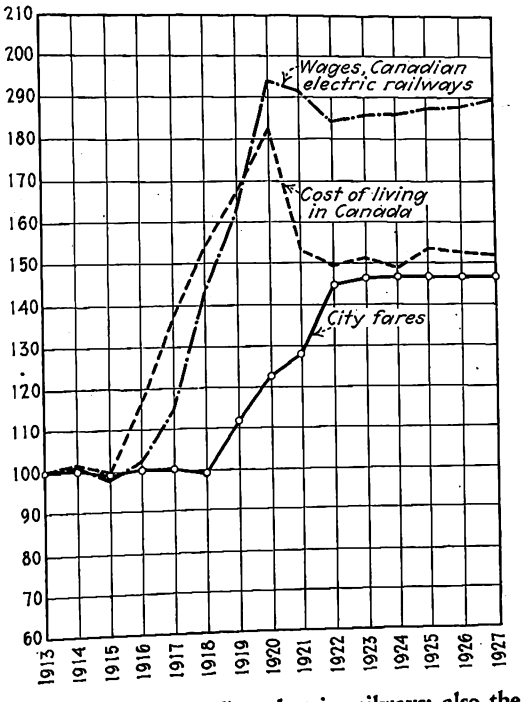
electric railways in 1927 was $48,289,774, and they had in operation 2,507 miles of single track.

The first chart shows the percentage distribution of total revenue by years from 1909 to 1926. The increase in operating expenses and in deductions from income are notable. The latter increase is due to the large amount of financing which has been done by the issue of bonds, particularly where electric railways have been municipally owned. In such cases, if privately owned, stock would have been issued. The reasons for the reduction in percentage in operating expenses since 1921 have already been outlined.

The second chart gives comparison of fares, electric railway wages and the cost of living in Canada, the curves being charted by index numbers, with 1913 repre-



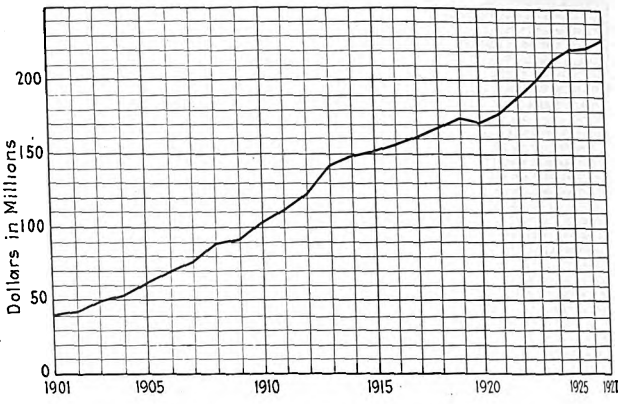
Fares and wages on Canadian electric railways; also the cost of living in Canada

senting 100. The cost of living, which rose rapidly from 1916 to 1920, dropped just about as sharply in the latter year but not so far. Since 1921 it has remained at about 150 per cent of the 1913 figure. Wages have also dropped considerably since 1920, but not in the same proportion as the cost of living, and there has been a slow increase in wages since the low point in 1922. Wages are now 90 per cent higher than in 1913, having had an increase almost twice as great as the cost of living and just about twice that of fares. The figures on wages have been obtained from the Dominion Labor Department and on the cost of living from the *Labor Gazette*.

The third chart gives the capital investment in Canadian electric railways from 1901 to 1927. Continued increase in that investment indicates belief, in the opinion of investors, of the stability of the electric railway industry of Canada. In 1927 the electric railways in Canada operated 4,397 electric cars and 212 buses.

Automobile registrations in Canada have increased from 50,000 in 1913 to 939,000 in 1927. From 1913 to 1916 the annual increase was on an average of 24,000. From 1916 to 1927 the annual increase has been greater, with an average of 74,000. The population of Canada in 1921 was 8,788,483 and in 1927 about 9,500,000.

The number of revenue passengers continued approximately the same, averaging 595,000,000, from 1913 to

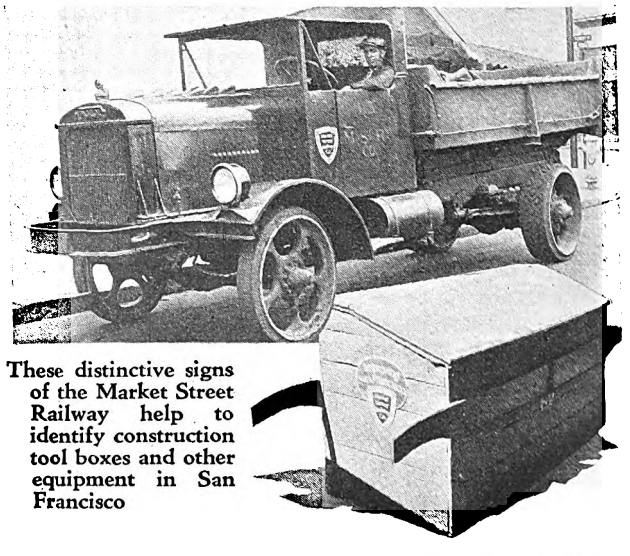


Capital investment in Canadian electric railways

1918. From that date the number increased until the peak was reached in 1920, when 804,711,333 passengers were carried, being an increase of 35.2 per cent over 1918. In 1921 there was a decrease of 85,405,892 from 1920, or 10.6 per cent. From 1921 to 1925 the number of revenue passengers carried showed little if any change. In 1926 an improvement was shown with 748,710,836 against 725,491,101 in 1925, or an increase of 3.20 per cent. In 1927, however, a still greater improvement was shown, 776,615,193 revenue passengers being carried as against 748,710,836 in 1926, or an increase of 3.75 per cent; this in face of the large increase in automobile registrations in the past two years. In 1927 automobile registrations increased 13.3 per cent over 1926.

The 1928 returns during the early months of 1928 register an average gain of 5 per cent over 1927 in the number of revenue passengers carried. These gains appear to be steadily increasing.

Shield Confers Style



These distinctive signs of the Market Street Railway help to identify construction tool boxes and other equipment in San Francisco

CONSTRUCTION tools and other street equipment of the Market Street Railway, San Francisco, Cal., are marked by a large shield, adopted by the company as a standard emblem. The emblem not only identifies the owner of the equipment but is proof to observers of the extended nature of the company's business.

The shield is of baked enamel with a green border and an inside red panel with white lettering. Illustrations show it on a construction truck and a tool box. It is also used on barrier signs, welding equipment, etc.

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Looking down the overhaul lines in the new P.R.T. bus shop

New P.R.T. Bus Shop

Puts Maintenance on Production Basis

Expected saving of 1 cent per bus-mile will pay cost of entire plant in three years. Specialized shop departments occupy one side of building while vehicles being overhauled move in four lines along opposite side. Training of workmen an important feature of shop operation

RAPID growth of bus operation in Philadelphia is reflected in the completion recently of a half-million-dollar plant wherein will be conducted all major maintenance operations for the entire bus fleet of the Philadelphia Rapid Transit Company. The new structure, which is situated at Third Street and Hunting Park Avenue, is the largest bus repair shop in America and probably the largest shop in the world devoted exclusively to automotive repairs.

Bus service was inaugurated by the P.R.T. in September, 1923. At that time the fleet consisted of fourteen vehicles. This modest forerunner of the present-day fleet was housed in a corner of the 24th Street and Fairmount Avenue carhouse. Subsequent growth has been rapid and today the company has 570 gasoline-electric vehicles. These are housed in eight operating garages variously located in Philadelphia and Camden, N. J.

The new plant has a ground area of 10 acres. The building is a one-story structure, with a floor area of 110,000 sq.ft. It represents an investment of $500,000, of which more than $100,000 was expended for maintenance facilities and shop equipment. Before attempting to lay out this project H. B. Hewitt, general superintendent of the company, and his associates personally visited and studied many of the important bus operations in this country and Europe in order that no detail in the way of improved methods might be overlooked. The result is a bus shop that embodies the most modern ideas.

Among the more important items that can be included in the yearly potential production capacity of this plant are: 600 completely overhauled buses; 500 complete paint jobs; 600 rebuilt engines; 3,200 sets of relined brakes; 2,000 power motors overhauled; 1,000 power generators overhauled; 500 distributors and coils rebuilt; 500 batteries partially and completely rebuilt; 2,000 universal joints rebuilt; 600 steering gears overhauled; 650 sets of bus seats reupholstered; 650 sets of window sash rebuilt; 600 front axles rebuilt; 600 rear axles overhauled.

Three important advantages are gained by grouping all facilities under one roof. First, it eliminates the need for more than 10 per cent of spare vehicles. Second, it reduces the size of stock inventories. Third, it is possible to have all major repairs and overhaul work done by a relatively small number of men.

Will Pay for Itself in Three Years

One of the most important factors that influenced the P.R.T. in this undertaking is an anticipated saving of 1 cent per bus-mile. With a yearly operation in excess of 20,000,000 miles, the new shop will pay for itself through these savings in less than three years.

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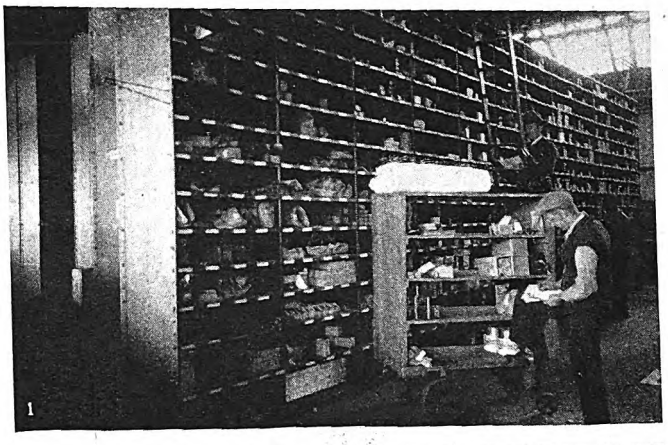

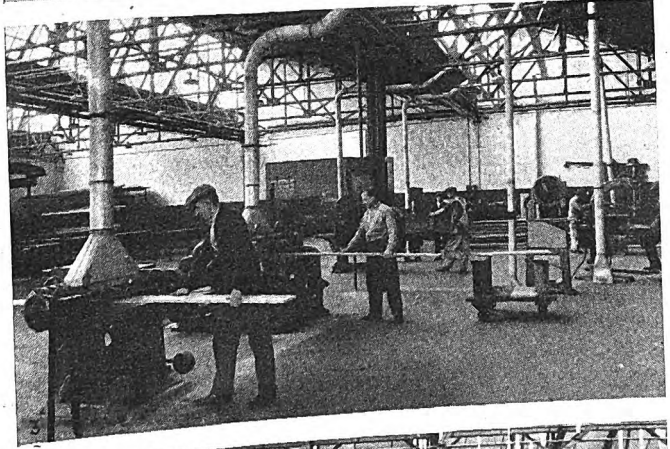

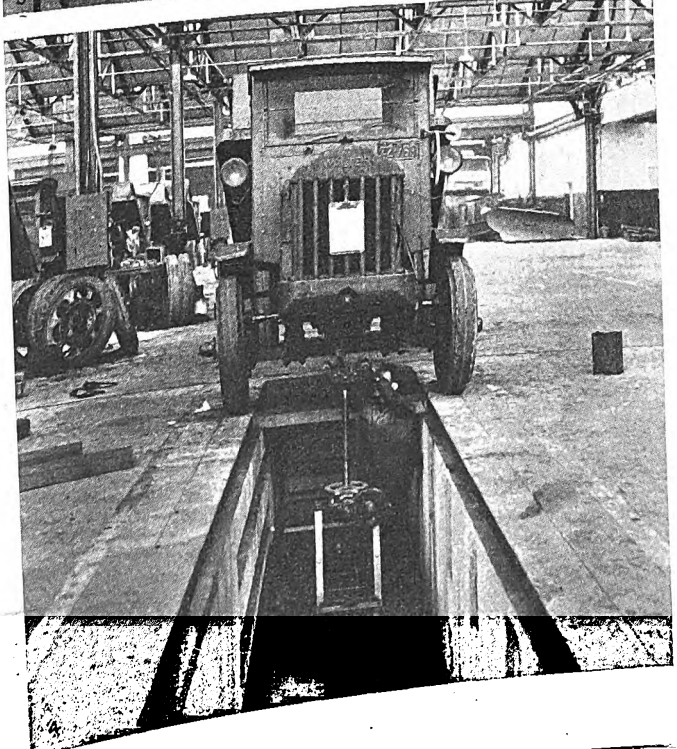

The arrangements of the plant and the routing of the work are important factors in the successful operation of this shop. Buses scheduled for repairs are first given a thorough cleaning on the wash rack, to remove grime and dirt that otherwise would be carried into the building.

The bus is then driven over the service pits. Extending over the four lines at this point is an overhead crane for lifting and removing the various chassis units. In the pits are jacks for handling the motors and generators, as well as other under-chassis parts. Here the engine and motive power units are removed and distributed to the respective repair departments. If for any reason the body must be removed the job is done at this time and the unit sent to the body shop on a dolly truck.

As the chassis moves forward on the line, the radiator, steering gear, battery and axles are removed in turn and reconditioned units installed. There is no attempt to make running repairs on these parts except in one high-speed line provided for emergency work.

Units are removed—and replaced—at the point along the line which is most convenient to the respective repair departments. For example, the axles are replaced at a point adjoining the axle overhaul department, the engine installed when the bus is nearest the engine department, and the body repaired when the vehicle is convenient to the sheet metal, the wood-working and the upholstery shops.

At the pits midway along the lines the frames are thoroughly gone over and all loose rivets replaced. The vehicle then moves forward to the body section, where damaged panels are repaired, broken windows and sashes replaced and seats and interior linings carefully gone over. Fenders, when not too badly damaged, are straightened or welded without removing them.

All repairs having been completed on both chassis and body, the vehicle is moved onto the forward pits. Here it is thoroughly inspected—but only for possible imperfections in assembling. The checking of the various units for defects in material, faulty operation or workmanship, is the duty of the inspectors in the various shop departments. Finally, the bus is run onto the brake-testing machine and, if found in good order, is sent to the paint shop, after which it is ready to take its place again in daily operation.

The specialized shop departments are situated, for the most part, along the west wall of the building.

On entering the wood-working shop, which is situated immediately back of the offices, there is an impression of clean, wholesome working conditions which prevails throughout the entire shop—not even excepting the pits and cleaning racks. Although there are some ten mortisers, jointers, planers and other wood-working machines in this area, all busily engaged in work that produces large quantities of wood dust, shavings and chips, the air is singularly clean because all refuse is drawn away from the machines as fast as produced and piped through an overhead exhaust system to a large metal container outside the building. Accumulations are carted away to be burned under heating boilers. This shop furnishes all body frame members, flooring, special seats, doors, window frames and other replacement parts that are

No. 1—The stockroom houses materials worth $150,000. Metal shelves and bins make for economic use of storage space.

No. 2—A corner of the salvaged materials stockroom. Orderly arrangement here means greater speed in filling requisitions.

No. 3—The wood-working shop presents a neat appearance. Sawdust and chips are taken away by overhead exhaust system.

No. 4—Cradle top lifting devices in the repair pits make removal or installation of heavy parts a simple matter.

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needed to keep P.R.T. buses in good order. It also supplies a large variety of general millwork that is continually needed by an organization of this size.

The machine shop adjoins the wood-working mill. Here are production tools of the type rarely found outside of manufacturing plants. There is no crowding of machinery in this shop. Each unit is placed so as to give the machinist plenty of light and operating convenience. All machines are served by an overhead monorail crane. The lathes, numbering five in all, are ranged along the windows in the west wall and are staggered diagonally to facilitate the handling of bar stock and at the same time to prevent workmen at one machine from being injured by flying chips from another.

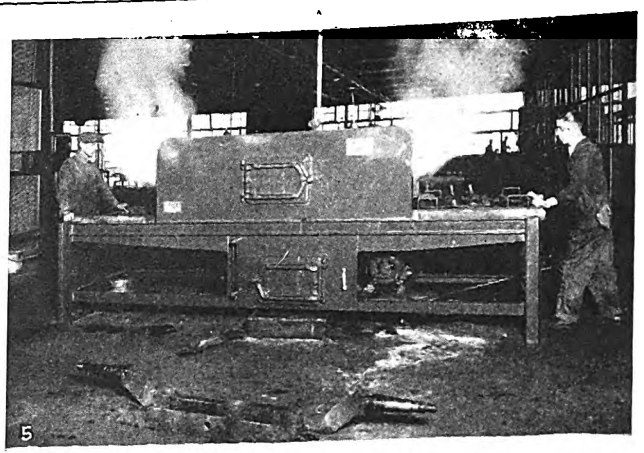
The tool room, which is a part of the machine shop, contains a large variety of precision instruments and special tools. Micrometers, gages, test blocks, every conceivable size of tap and die, and even a Brinell hardness tester and a scleroscope are found here. In addition there is a tool-room lathe, a sensitive drilling machine and a drill point grinder.

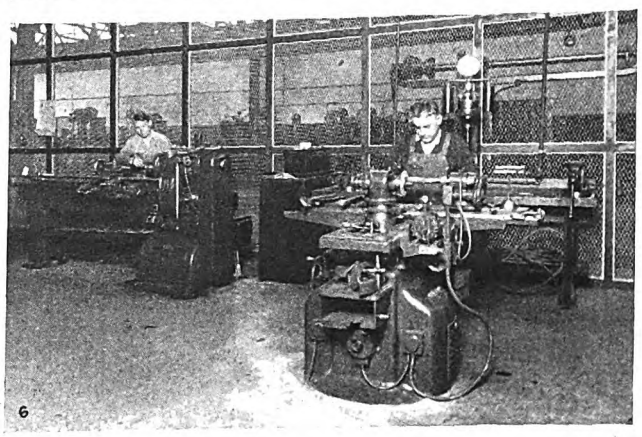
This department designs all of the tools used in the machine shop as well as jigs, fixtures and special appliances required by the other departments. Tools are issued on written order only. The mechanic signs a card check which is held by the tool-room clerk until the borrowed item is returned. Ordinary hand tools are furnished by the mechanics themselves. An agreement with a local dealer enables the men to purchase tools at the same discount allowed the P.R.T.

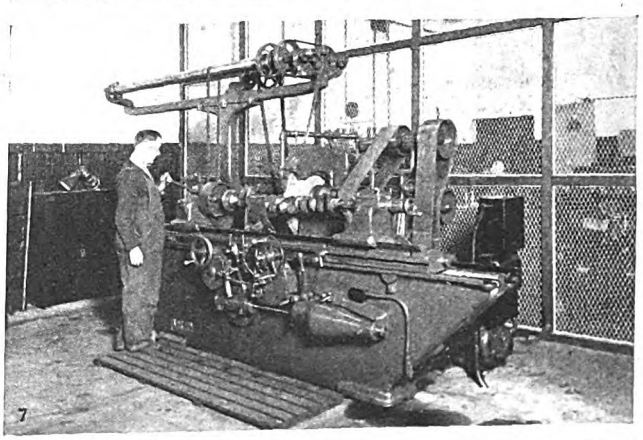
The engine overhaul department can turn out fourteen completely rebuilt engines a week with a force of fourteen men. No repairs of any description are handled in this shop. Its functions are limited to dismantling and reassembling—its job, to guarantee 105,000 kw.-hr. (approximately 90,000 miles) of unimpaired engine operation. Here the units are dismantled and the carbureter, generator, starting motor and other accessories removed and sent to their respective overhaul departments for inspection, adjustment and repairs.

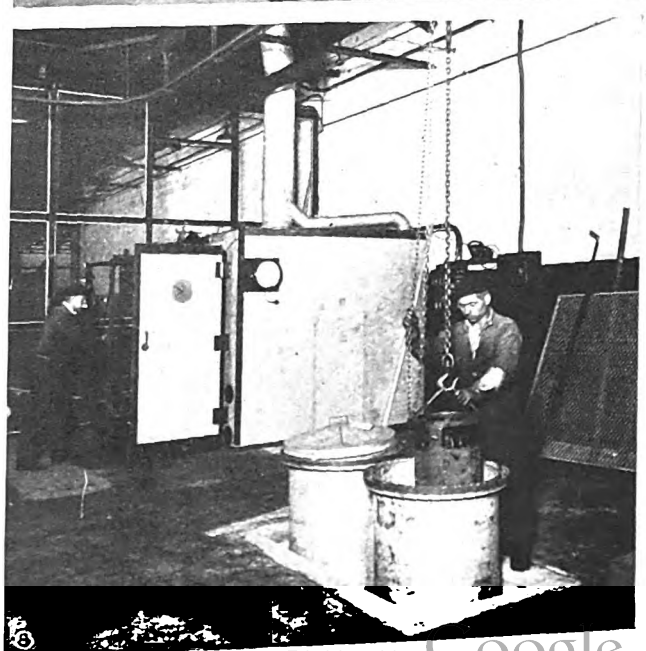
The electrical shop has two subdivisions: one is devoted solely to the maintenance and repair of starting, lighting and ignition units; the other handles nothing but power-electric motor and generator units. The former is well equipped with instruments that simplify the job of the electrical technician and save time for the trouble shooter. All tools and testing equipment are arranged with special regard to the convenience of the workmen. An overhead monorail crane ranges the entire shop and is supplemented at key points by swing arm cranes and portable platform type lift trucks. Thus the need for manual lifting is reduced to a negligible factor.

The motive power shop, differing from practice followed in the engine department, is entirely self-contained and handles every operation from the time the defective motor or generator unit is removed from the chassis until it is finally rebuilt and again ready to be reinstalled. Lathes have been installed for renewing the working surfaces of the commutator, machines for rewinding the armature coils and innumerable other tools for the manifold operations incident to the daily work of this depart-









No. 5—Dismantled parts are cleaned in a steam washing tank to determine if they are worth salvaging.

No. 6—A corner of the tool room where various jigs, fixtures and machine shop tools are made.

No. 7—Crankshafts are reground on this machine while the engine is in process of overhaul.

No. 8—Installation of dipping pots and a baking oven enables P.R.T. to impregnate and bake all armatures and field coils.

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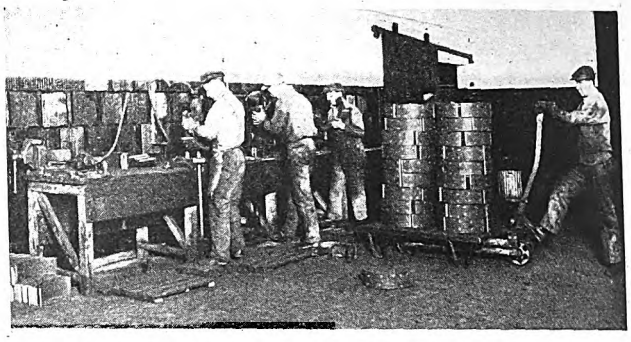
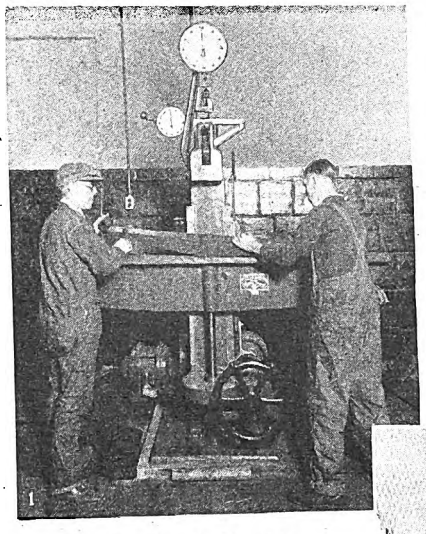
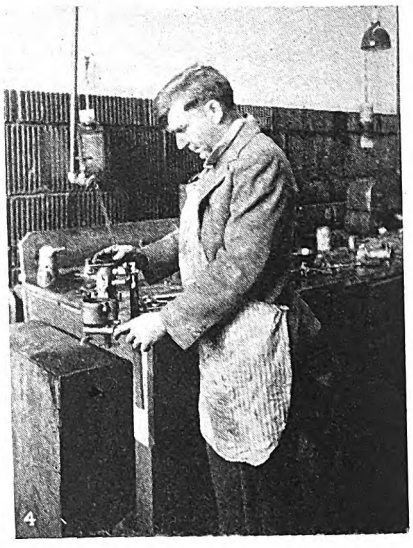
ment. Recent installation of an electric oven now enables the P.R.T. to impregnate and bake armature and field coils, a class of work that was formerly handled by the manufacturer.

Adjacent to the motive power shop are the combined radiator and gasoline tank departments and, in a fireproof-partitioned room, the blacksmith shop. The hammer of Vulcan is driven by an electric motor while the flaming forges are fanned by air turbines. Both electric and acetylene welding are needed to carry on the intensive production schedules of this department. Its tasks include not only the repairing of chassis and body parts but also the fabrication of steel framework, the manufacture of "bus stop" sign standards, pipe bending, also spring repairing and testing. For the latter purpose a laboratory testing machine has been installed and in the future springs will be tested for loss of resiliency or other defect each time a vehicle is brought to the plant for scheduled overhaul.



Brake relining keeps a crew of four busy all day long





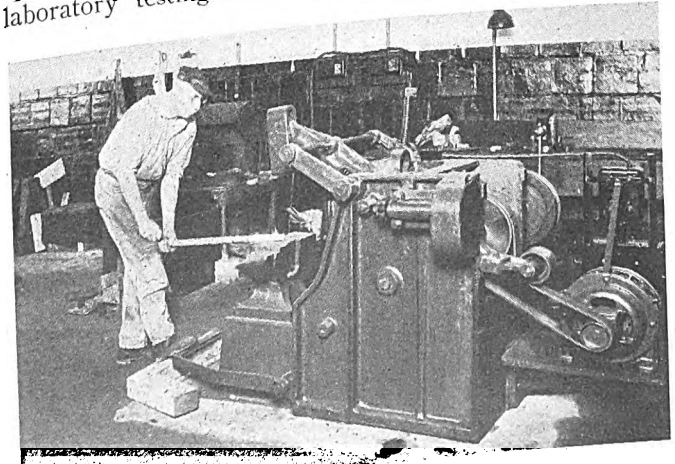
Exacting Tests Insure Proper Operation

No. 1—A machine that accurately determines spring condition.

No. 2—An instrument for determining hardness of metals is an important item of tool room equipment.

No. 3—Testing brakes. The last step on the overhaul line prior to painting.

No. 4—Frequent carburetor tests are essential to economic fuel consumption.



The mechanical sledge makes blacksmithing a one-man job

In the brake relining department four men are kept busy all day long, each with his own particular task. For example, one man does nothing but strip off worn lining, another drills the new materials, a third countersinks and inserts rivets while a fourth operates the pneumatic riveter. Linings are purchased directly from the manufacturers cut to proper size with edges chamfered and ready to apply. To simplify installation each piece is run through rollers which bend it to conform with the face of the brakeshoe.

The battery room is situated at the rear of the plant adjacent to the four vehicular entrance doors, and where buses destined for the overhaul lines can be served with utmost convenience. Inconspicuous with regard to location, the battery shop, nevertheless, is in the front ranks so far as importance is concerned. Each year more than 500 disabled batteries pass through this shop and

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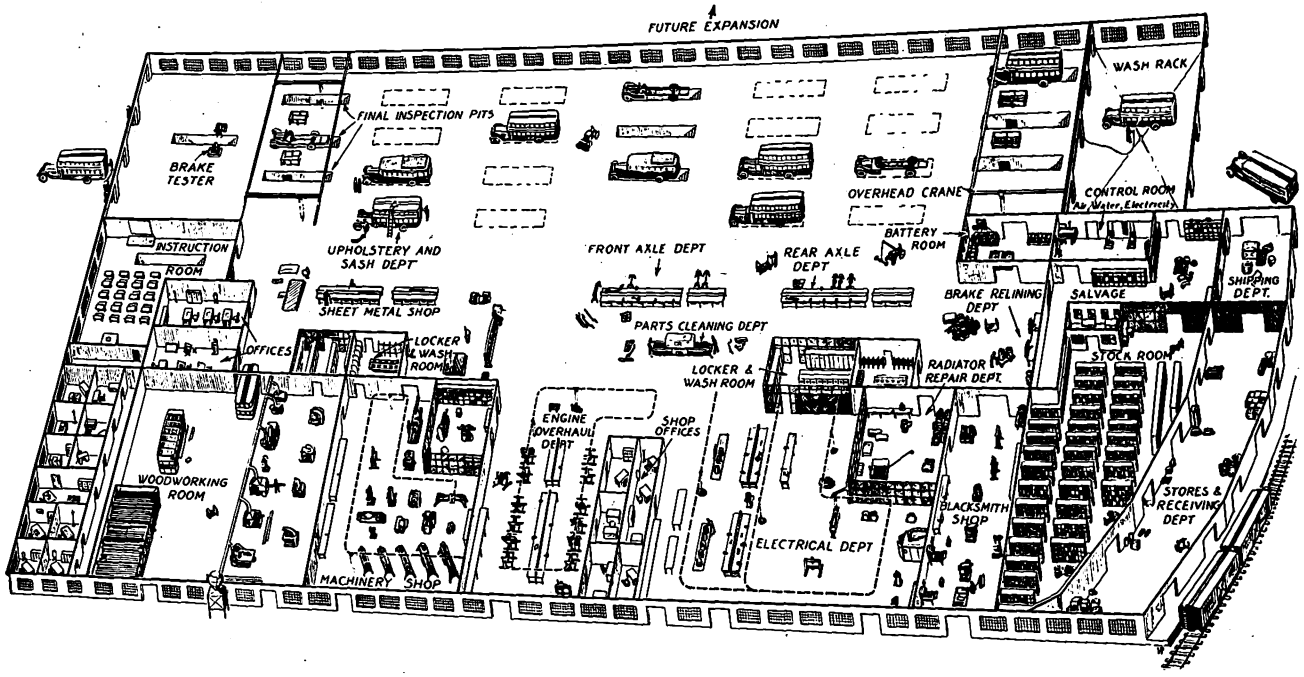
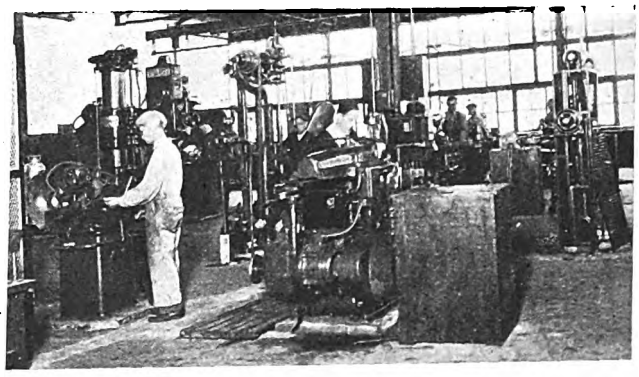


The plant is laid out to secure maximum efficiency and minimum lost motion. The result—lowered unit production costs and increased output from the assembly lines

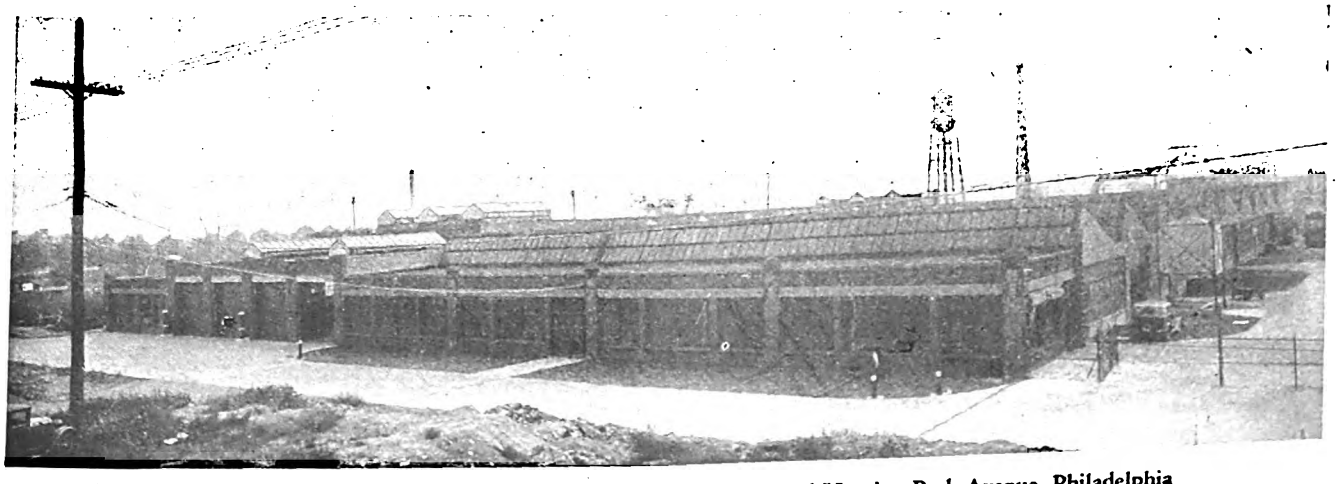
emerge completely rejuvenated, serviceable units. Some of them need complete rebuilding, others need a new cell group or a new case or perhaps only a change of electrolyte. No job is too large or too small for this department. As units are removed from the buses they are placed on grocer-type trucks for delivery to the battery room. Each truck has a normal capacity of five batteries in single tier but will handle ten units in a double tier. In so far as possible, the batteries are serviced and charged without removing them from the trucks, thus doing away with benches and the need for any great amount of manual lifting.

Both the front and rear axle departments, as well as the parts cleaning tank, are placed in the center of the plant midway between the shops and overhaul lines and therefore convenient to both. Axle assemblies as received from the overhaul line are dismantled and parts sent to the steam cleaning tank where dirt, grease and other foreign matters that might prevent careful inspection or accurate measurements are removed. Salvageable parts are sorted out for subsequent reconditioning either by machining or building up process, while those that are too far gone to permit reclamation at reasonable cost are consigned to the junk pile.

On rear axles, the worm carriers are removed and completely gone over and new or rebuilt parts substituted for worn ones. Axle shafts and bearings are replaced, if worn, and the housing thoroughly inspected for cracks



A corner of the machine shop, with plenty of light and working room in evidence



For bus maintenance only—new P. R. T. plant at Third Street and Hunting Park Avenue, Philadelphia

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or distortion. Front axles are checked for misalignment and new bushings and king pins fitted. Worn spindles and bearings are replaced. Production of front axles totals twelve a week with a similar number of complete rear axles and worn carrier assemblies.

The sheet metal department is equipped with shearing machines as well as tools and devices for bending, rolling, forming and crimping sheet steel and aluminum. Its duties include the cutting and shaping of hoods and body panels, also the manufacture of metal trays and countless other things used about the garage. In addition to taking care of all repairs, the upholstery shop turns out tpproximately five sets of seats per week. The sash department not only reglazes windshields, doors and windows but also manufactures for replacement five complete sets of sash weekly.

Stock Inventory $150,000

Material worth approximately $150,000 is carried in the main stock room, which also supplies materials for the subsidiary stock rooms located at various operating garages. A system of card tags showing unit inventory costs has been worked out, one of these cards being attached to each storage bin or compartment. In this way it is possible for the stockkeeper and foremen issuing an article to know the actual cost of that particular item, simply by referring to the card on the bin. The psychology of this practice is to give individual employees a better understanding of the dollars and cents value of the repair and replacement parts used.

Adjoining the stock room in the extreme rear of the building is the salvage and reclamation department, where units sent in from the various operating locations are examined, tagged for repairs or stored for salvage purposes. Both this department and the stock room face on a broad concrete loading platform which is served by a railroad spur track and is also available for truck loading. An inclined concrete ramp from the lower ground level gives access to the building.

To the west of the shop but in a different building is the experimental laboratory where standard practices for the machine shops and garages are set up and new maintenance and operating developments worked out. It will accommodate one double-deck bus, two single-deck buses or four taxicabs. It possesses every facility for the widely varied range of work contemplated by company engineers. An example of the results which have been obtained from this work in the experimental laboratory is the increase by 33⅓ per cent in horsepower output of bus engines used on P.R.T. vehicles.

An experimental paint shop also has been set up adjoining the bus shop, and exhaustive research in the problem of spray painting is to be carried on at this point, while construction work on the main paint shop is under way. The methods which will be followed as standard practice in the new paint shop will depend largely on the outcome of research work to be done in the interim.

Personnel Training Proves Valuable

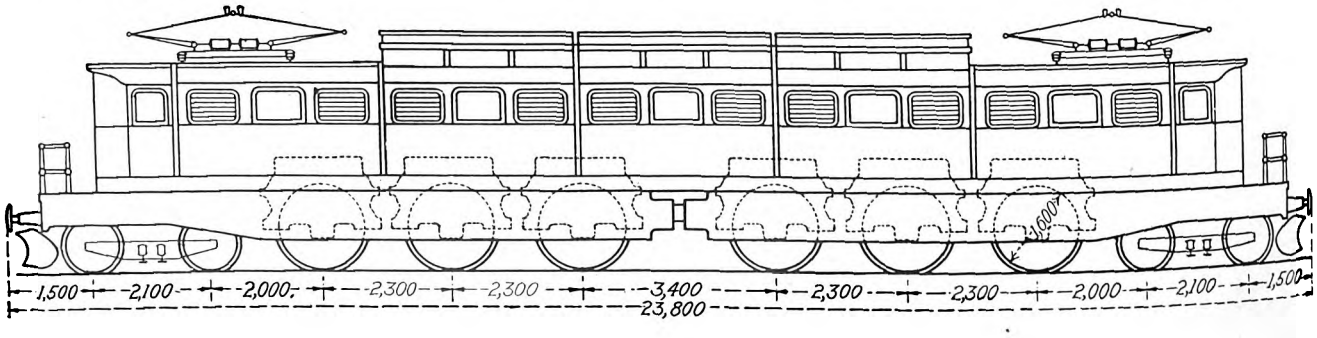
The instruction room ranks among the most important departments in the plant. Here, by means of moving pictures, illustrated lectures and practical working demonstrations, the company expounds its theory that there is all the difference in the world between telling a man to do a job and explaining the reasons why. Training classes are carried on in the evening and all employees are given an opportunity to attend. During these classes many problems of the day are brought up and ensuing discussions very often result in suggestions that are valuable to both company and employees. As a result of constructive suggestion, the men are ever on the alert for new ideas and better ways of doing their job.

5,400-HP. Electric Locomotives for French Railroad

FOUR d.c. electric locomotives recently ordered by the Paris, Lyons & Mediterranean Railway, France, will, it is claimed, rank as the most powerful single locomotives so far built. The contract for the electrical equipment of the engines, which are to have a one-hour rating of 5,400 hp., has been placed with the Société Oerlikon, Paris, while the mechanical part is being constructed by the Société de Construction des Batignolles in Paris.

Four years ago the P.L.M. Railway started a trial service on a section of the Mont Cenis tunnel line, with a view to collecting data regarding the most suitable type of express locomotive. Four different trial locomotives were ordered. The results obtained in these tests with an Oerlikon individual-drive engine proved most satisfactory. Investigation showed, however, that it was advisable to have a considerably higher output than that of the trial locomotive; in view of which the number and output of the driving axles had to be increased.

The locomotives now in course of construction are of the 2CoCo2 type with close-coupled trucks and an overall length of body of 78 ft. They have the Oerlikon individual drive, each of the six driving axles being driven by a twin motor. With a pressure of 1,350 volts at the contact line, these motors each develop 800 hp. at 45 m.p.h., while with the full pressure of 1,500 volts the one-hour rating is 900 hp. per motor or 5,400 hp. for the locomotive, outputs being measured at the wheel treads. The permissible axle load is 18 tons and the maximum speed 80 m.p.h. The locomotive weighs 153 tons, so that the weight per horsepower at the one-hour rating is 63.5 lb.



Side elevation of 5,400-hp. locomotives recently ordered by P.L.M. Railway

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Glasgow Modernizing
Gets Fine Start

Concentration of rehabilitated and modernized cars on Uddingston route increases earnings 1.6 cents per mile within the first four weeks. The Tramways schedule speed was increased to 10 m.p.h.

By Walter Jackson
Fare and Motor Bus Consultant

FOR many years the Glasgow Corporation Tramways has stood out as a conspicuously successful example of street railway operation. The fares were the lowest in Great Britain and headways were so short that walking was an almost unknown form of outdoor sport.

This undertaking was one of the last to succumb to the need for a higher scale of fares, due partly to the heavy traffic and partly because the greater part of the investment had been paid off, in addition to setting aside funds for depreciation and renewals. At the present time, in fact, only 44 per cent of the investment remains outstanding on the books.

During 1925, or about the time a healthy financial condition had been restored, the motor bus made its appearance as a competitor. These buses could be regulated only with the greatest difficulty because their ostensible purpose was to pick up passengers outside the Glasgow area and deposit them within Glasgow. Actually, many of them did pick up city riders at considerable loss to the Tramways.

Glasgow cars are being reconditioned both for better technical performance and greater passenger comfort

Since the Parliamentary regulation of services of this kind is still in a nebulous state, the Glasgow management had to find some quick means of helping itself out of this situation. At that time the scale of fares ranged from 1d. to 10d. Most of the bus pick-ups were longer-ride passengers. Upon recommendation of the general manager, on July 1, 1926, the maximum fare was reduced to 2d. (4 cents).

This had the immediate effect of bringing back much of the lost business and creating some new traffic in addition. However, at no time did Lachlan Mackinnon, general manager, believe that so low a fare as 2d. should remain permanently.

The 2d. all-the-way rate was simply a dramatic way of letting the unregulated competitor know that he would have a fight on his hands and was a "hands-off" warning to possible newcomers. Meanwhile, the management was making plans along two lines that would maintain the priority of the Glasgow Corporation Tramways. The first of these lines was the inauguration of motor-bus services. The second was the replacement of the oldest cars and the modernization of the remainder.

The 2d. all-the-way fare having achieved its purpose, the management suggested July 10, 1928, an increase to 3d., which would still be 7d. under the old maximum fare. At the same time Mr. Mackinnon suggested the abolition of the minimum fare of ½d. which was reinstituted July 1, 1927, following its first abolition on June 1, 1920. The new scale as recommended to the corporation is as follows:

NEW SCALE OF FARES IN GLASGOW

	Stages	Average Distance (Miles)
1d.	2	1.14
1½d.	4	2.28
2d.	8	4.64
2½d.	12	6.96
3d.	Over 12	....

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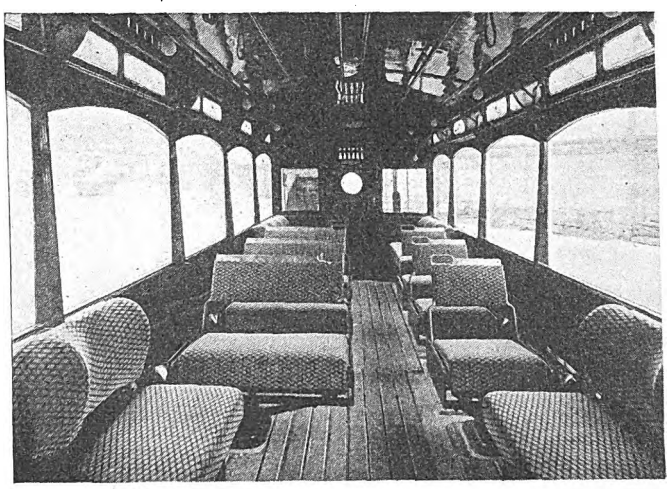
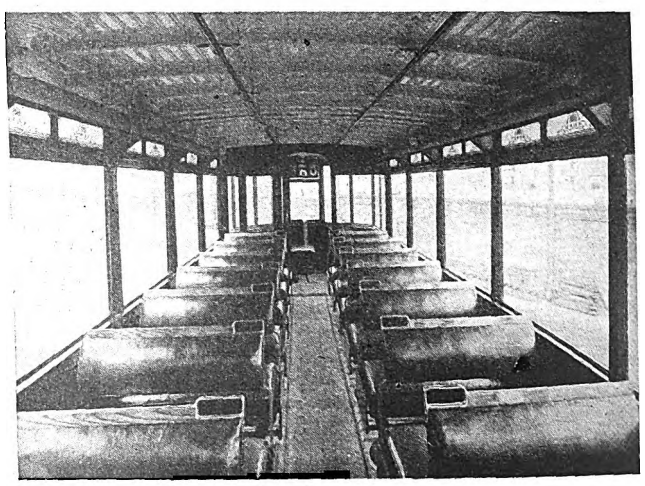
With the foregoing scale in vogue, the management believes that it will earn revenues sufficient to carry out an extensive modernization program. It is already operating 45 motor buses and has 100 more on order. Of the buses, fifteen are double-deckers seating 51.

Fifty New Cars Ordered—150 Cars Modernized

As can be said of many American street cars, Glasgow's tramcars have been built and maintained altogether too well. If it hurts to scrap a car in America, what shall be said about doing the same thing in Scotland? However, like causes bring like results. So long as the Glasgow public knew only the hard-seat tramcar, it was content to glory in the cheapness of the ride; but when personal cars were reinforced by a flood of soft-seated motor buses, the "good old trolley" looked more old than good. The cut to 2d. "all-the-way" was just the thing for a temporary measure. In the end, the really permanent policy was to build up a higher quality of service at a higher scale of fares.



Glasgow lower-deck passengers are now literally riding on velvet. Only the corner seats are longitudinal



Glasgow upper-deck passengers now ride on leather seats and smoke if they like

In America, ideas like these have to be sold to boards of directors; in Glasgow to a City Council of differing political and economic outlooks. For very many years the tramways had been such a handsome source of revenue to the common good that more than one councilor was aghast at the thought that profits had better be turned into moderization outlays if there were to be such contributions in the future. Other councilors less interested in tax reduction might object on the grounds of low-fare policy favoring the working-class riders. It will be seen, therefore, that the management had to be content with a slice of modernization in the hope that the rest of the loaf would be granted later.

But in April, 1927, the Council voted funds for the purchase of 50 new cars and the modernization of 150 cars, as will be told hereinafter. The system operates altogether some 1,100 cars, of which 500 have been in use since the electrification of the tramways in 1900! Modernization treatment is considered feasible for about 330 cars in all.

On April 26, 1928, the Council also decided to purchase 100 double-deck buses.

The modernization program, as will be seen, is not confined to the refitting of the cars but also to speeding them up. The average schedule speed of the Glasgow system is 9.3 m.p.h. The modernized cars have been remotored to give 10 m.p.h. The first few of these cars received were put in service about the system, more or less as an advertisement, but this did not give the desired opportunity of learning what the improvements could be made to mean in economy and higher earnings. Hence the required number were concentrated to care for all the Monday-Friday needs of the Uddingston route. Because of the higher schedule speed, it was found that 32 cars would do the work of 33. The riding public soon discovered that the cars were not only more luxurious, but saved six minutes running time. This discovery was prompt indeed, as proved by the jump in earnings from 15.84d. to 16.63d. per car mile, an increase of 0.79d. (1.6 cents) in the four weeks of June, 1928, compared with the preceding four weeks. Here is the way work was done.

The cars were carried on Brill 21-E trucks of 7 ft. wheelbase. These trucks were lengthened to 8 ft. wheelbase and equipped with one of three types of roller bearings—Hoffman sleeve, S.K.F. or British Bock (tapered rollers). These anti-friction bearings were installed without regard to possible saving of energy but solely to attain smoother riding. The lengthening of the truck and the installation of these bearings has stopped nosing or side play to such an extent that these double-deck cars can be operated up to 30 m.p.h. running speed with no such discomfort as was formerly experienced at much lower speeds.

To reduce noise, there was inserted a rubber strip $\frac{3}{4}$ in. thick by about $3\frac{1}{2}$ in. wide between the top of the truck frame and the side sills.

The substitution of high-speed, light-weight motors made it possible to lower the floor level, since 27 in. wheels now replace $31\frac{3}{4}$-in. wheels. The old motors were two Westinghouse 49-B rated 35 to 40 hp. Higher speed is now given by two MV-101 DR Metropolitan-Vickers

SCALE OF FARES FOR BUSES

	Stages	Average Distance (Miles)
1d.	2	1.12
1½d.	3	1.66
2d.	4	2.22
2½d.	6	3.28
3d.	8	4.22
3½d.	10	5.41
4d.	12	6.62
4½d.	14	8.03
5d.	16	9.08

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motors rated 50 to 60 hp. each. The higher horsepower is approximated in practice because the average line potential is 575 volts. The gear ratio is 13:62.

Twenty of these cars have also been fitted with contactor controllers including field control, whereby up to 40 per cent of the current can be shunted to permit a speed on the level of 28 m.p.h. instead of 22 m.p.h. The controller used is designated as the Metropolitan-Vickers OK-23B. The field shunt switch is brought into use only on the last parallel position. A relay prevents overloading of the motors.

The higher running speed of these cars is balanced by improvements in braking. For the first time, a group of Glasgow cars has been equipped with air brakes instead of depending on hand and short-circuiting brakes alone. These air brakes are used for all service stops except occasional trial stops with the hand brake. Still better emergency stops than before have been secured by the use of two sets of magnetic brakes instead of one. The brakes are reinforced by two sets each of pedal-operated and pneumatic sanders.

In past years car heating was unknown in Glasgow. The installation of various types of electric heaters is another novelty.

In line with this tendency is the complete inclosure of the upper deck. The canopy has been extended at each end and a pleasing glazed vestibule installed. Through the removal of superfluous gadgets elsewhere, the overhung weight has not been increased.

The change most apparent to the public is, of course, the reupholstering of the seats. The longitudinal seats on the lower deck have been replaced by a combination of cross-seats and short benches in the corners upholstered in moquette. As the Glasgow cars have a 6 ft. 10½ in. outside width and 6 ft. inside width, the transverse seats are double on one side and single on the other side. The cushion width of a double seat is 30 in. but the actual seat space is 35 in. The clear width of the aisle between the double and single seats is 15½ in. In the rearrangement of the lower deck, the number of seats was cut from 24 to 21.

The upper deck has fourteen cross-seats, seating 28 passengers, and longitudinal seats on the canopies for ten passengers. These have been retained through the simple substitution of genuine leather upholstering. It will be seen from an illustration that the seat-backs are not full, as is customary in American practice. In this way it is possible to avoid lengthening the seat spacing, which remains at 26 in. center to center.

The practice of designating each route by cars of certain color combinations has been retained, but for the benefit of strangers and of residents unfamiliar with a given route an improved form of roller destination sign has been adopted in place of the less conspicuous markers formerly used.

The foregoing improvements plus a number of constructional changes were made at an average cost of £1,000 per car. The job has been done on a maintenance basis with an average time of three cars per week.

Since the foregoing was written, the Tramways Committee has recommended (October, 1928) the acceptance of bids covering £183,215 ($890,425) of electrical equipment, brakes, roller bearings and upholstered seats for 300 re-conditioned cars.

Who Will Receive the

$200 Maintenance Prize?

AT A RECENT MEETING of the executive committee of the American Electric Railway Engineering Association it was decided that the awarding of the $200 individual prize in ELECTRIC RAILWAY JOURNAL's Maintenance Contest and the presentation of the company trophy and departmental certificates of merit will form part of the program at the general session of the engineers during next year's convention at Atlantic City. This will focus attention on the improved methods and equipment that are being originated by electric railway maintenance forces, resulting in better and faster work and decreased costs.

Send in your items for ELECTRIC RAILWAY JOURNAL's Maintenance Contest. You are sure of $5, as that amount is paid for each item published, whether it wins a prize or not.

There are twelve $25 departmental prizes to be awarded to individuals sending in winning maintenance ideas. These will be divided equally between the following four maintenance divisions: (1) Rolling stock and shops; (2) way and structures; (3) electrical and line; (4) buses and garages, including shop equipment for bus maintenance.

The most sought after prize of all will be the $200 individual prize to be awarded at next year's annual convention to the person submitting the best maintenance idea during the contest.

Don't delay in getting started! There is no limit on the number of items that may be sent in by one person. The more you submit the better chance you have of winning one or more of the big prizes. Some companies are organizing all maintenance departments to go after these awards. Look up the announcement in the Oct. 20 issue of the JOURNAL, or send for copies of the instruction folder!

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Interborough Exhibits Its Safety Equipment

Devotes bay of its 147th Street shop to show features of car and track equipment—More than 4,000 persons attended during 22 days in October

DURING October the New York public had an opportunity to study subway construction and operating methods first hand, particularly the precautions used to insure the safety of passengers.

Shortly prior to the Safety Convention, held in New York during the early part of October, the Interborough Rapid Transit Company was asked to co-operate by making an exhibit of its safety appliances. To do so it set aside one of the recently completed bays in its shops at Seventh Avenue and 147th Street, whitewashed the walls and staged an exhibit of which some views accompany this article. A large delegation from the Safety Congress was taken from the Pennsylvania Hotel, on 33rd Street, to the shops by buses on Oct. 5. The delegates were met by James S. Doyle, assistant to the general manager, and conducted around the exhibit, while representatives from the different departments explained the features shown. Later, the delegates were taken to the yards, where a demonstration was made on a train of some of the most important safety features of the equipment, particularly the automatic multi-side-door, the signal and automatic trip system and the dead man's button. A pamphlet, especially printed, explained and illustrated these and other fundamental features and gave some striking facts about subway safety. Thus, the statement was made that it is 22 times safer to be an I.R.T. passenger than to be on the streets of New York and six times safer than to stay at home. It has been calculated also that the average New Yorker, if he should travel continuously in the subway and should die only by accident, would live for 11,728 years.

The exhibit was so successful that the company decided to keep it open for very much longer than the period of the Safety Congress, and it remained open until Oct. 27. During that time it was visited by 4,349 people including several delegations from civic organizations, like boards of trade. The individuals included representatives from the police and fire departments of the city as well as company employees, many of whom visited the exhibit on Sunday, and all on their own time. Indeed, it was the first opportunity which most of them, particularly those in the clerical departments, had of obtaining a close view of subway equipment. Even some of the trainmen had never before seen the underside of a subway car with all the equipment mounted in place. This was possible at the exhibit because a standard car was raised high enough above the floor so that persons could pass under it, and the bottom was well illuminated with lights.

The Exhibit Was Comprehensive

Space will not permit here of an account of all or even much of the apparatus displayed. A list of the different departments represented, with mention of a few of the things shown, will give an idea of the representative character of the exhibit.

The first exhibit on the right to greet the visitor was a full-sized model of the multiple-unit type of remote door control. All parts were distinctly marked, and a separate display showed the various relays and other of the larger parts employed. Next came a display of the safety posters used through the shops, then an exhibit of the purchasing department, with samples of its specifications and inspection reports and some of the articles purchased in which safety is a dominant feature, such as treads of subway stairs. A placard declared that the value of materials purchased yearly by the company amounts to $9,685,000 and that 22,000 orders are issued per annum.

The next exhibit was one of the lighting system used in the subway, and the next the safety features of the chief engineer's department. These latter related principally to the employment of remote control for power, on which articles have been published in these columns. This exhibit included views of the emergency and other equipment of a ticket agent's booth.

First Steel Car Exhibited

At the end of the exhibit were three cars. One was a standard car, raised from the floor to a sufficient height to allow an inspection of its equipment. The second car was the first steel car put into use on the railroad. This car was built in 1903 and is now used as a pay and collection car. It is said to be the first steel passenger car ever to be put in regular service, as well as the first to be equipped with anti-climbing buffers. The third car on exhibit was the school car of the system.

On the left-hand side of the exhibit, adjoining the construction car, was a standard automatic tight-lock coupler and a pair of brightly polished wheels with axle and gear attached. Farther on were exhibits of the car equipment department, signal department, medical department and transportation department. In the center of the hall were a standard trailer truck and a standard motor truck.

During October the exhibit was open daily between 10 a.m. and 6 p.m. When advance information was received of the visit of an important delegation, arrangements were made whereby the visitors were received at the entrance of the administration building, and conducted through the shops to the exhibit room. Here the various exhibits were explained either by the heads of the several departments of their assistants. Then the delegates were taken to the demonstration track, where they were shown the operation of the track switch and dead man's button in regular subway operation.

Southern Equipment Men Complete Convention Plans

ARRANGEMENTS have been completed to make the Rice Hotel, Houston, Tex., headquarters for the joint meeting of the Electric Railway Association of Equipment Men, Southern Properties, and the mechanical division of the Southwestern Public Service Association, to be held on Jan. 23-25, 1929, in Houston. Hotel rates for a single room with bath will be from $3.50 to $5 per day, and for a double room with bath, from $6 to $8 per day.

Due to the interest in bus operations, Robert M. O'Brien, president of the Association of Equipment Men, has requested that questions regarding bus operating difficulties be submitted for discussion at the convention, in addition to the questions on general railway operations.

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Convention Plans Discussed by A.E.R.A. Executive Committee

EXCELLENT facilities for an exhibit of street cars, buses and other local transportation equipment are to be provided for the next annual convention of the American Electric Railway Association. As announced in last week's issue of ELECTRIC RAILWAY JOURNAL, this will be held in Atlantic City, N. J., Sept. 28 to Oct. 4, 1929. A. H. Skean, manager of the Atlantic City Convention and Publicity Bureau, and L. G. Dickey, manager of the new Atlantic City Auditorium, explained in detail the facilities to be provided in the new auditorium, in connection with the statement of the convention location committee, headed by W. H. Sawyer, which made its report to the executive committee favorable to taking the 1929 convention to the New Jersey resort city.

IDEAL FACILITIES FOR SUCCESSFUL CAR EXHIBIT

One problem which had given considerable concern to the location committee was that of providing suitable space for a representative exhibit of street cars at Atlantic City. This question involved not only the completion of arrangements for suitable space that would encourage manufacturers to send a representative exhibit of cars to the next convention, but also the matter of cost of such exhibits, which always was one that gave grave concern at Atlantic City. The arrangements completed by Mr. Skean and Mr. Dickey offered a very satisfactory solution to both of these problems.

The car exhibit will be arranged upon a great open plaza which is under construction on the beach in front of the boardwalk across the entire width of the new Auditorium building. Temporary tracks arranged in semicircular form across the ocean half of the plaza will provide space for approximately twenty cars in a location and setting highly advantageous to a successful exhibit. Special ramps from the tracks in the streets adjoining the Auditorium will permit the cars to be placed in position and removed after the convention with a minimum of labor. Arrangements have been made with A. J. Purinton, vice-president of the Atlantic City and Shore Railroad Company to assume the work of handling street cars from freight cars to the plaza and reloading them after the convention at a flat total price of $130 per unit, which would make the total cost of exhibiting cars in Atlantic City closely comparable with what it has been in Cleveland.

Within the Auditorium there will be space for housing the entire convention exhibit on one floor and in one room, with ample facilities for holding all meetings of the American and affiliated associations in conveniently located and comfortably equipped meeting rooms. After going over these facilities carefully it seemed to be the opinion of most of the members of the executive committee that the 1929 convention in going to Atlantic City will be held under almost ideal conditions.

Officers of the association were authorized to execute the contract which was prepared under the auspices of the location committee and which had already been signed by the proper representatives of Atlantic City. The dates for the convention provided in the contract are Sept. 28 to Oct. 4, inclusive, which is approximately one week later than the dates in Cleveland last year. Discussions which have ensued regarding objections to opening the exhibits on the Saturday preceding convention week had been reviewed by the locations committee, and were called to the attention of the executive committee. It was considered advisable to include the Saturday date in the contract, and the final determination of whether the convention will actually open on Saturday, Sept. 28, or on Monday, Sept. 30, will be referred to the convention program and exhibit committees. The locations committee likewise recommended that the program committee give consideration to the advisability of setting aside Monday afternoon and Wednesday mornings for the inspection of exhibits instead of the whole of Tuesday, as was done last year. In doing this it was felt that an inspection of exhibits on Monday afternoon, the first day of the convention, would be advantageous and do away with the need for opening the exhibit on Saturday. Furthermore, it was felt that by splitting exhibit day between a morning and an afternoon on different days, there would be a better opportunity for delegates with only a limited time at the convention, to go over the exhibits carefully and at the same time participate in the meetings of those associations in which they are particularly interested. Still another reason advanced in favor of this arrangement was that it would reduce the temptation to be absent from the convention which exists when an entire day is set aside free of meetings. By arranging the exhibit inspection on Monday afternoon and Wednesday morning, it was pointed out also that affiliated association meetings, starting on Tuesday afternoon, would run continuously for each of the three afternoons of convention week.

NEW COMMITTEES TO MAKE BROAD ECONOMIC STUDIES

In addition to the discussion of convention plans and the discharge of routine business which occupied most of the time of the executive committee meeting, President Barnes announced the appointment of several important American Association committees to study broad phases of local transportation economics, somewhat along the lines of the work done by the rapid transit committee and that being carried out by the committee on street traffic economics. These new committees include a committee on the economics of interurbans, a committee on fare schedules and a committee on the co-ordination of public transportation facilities. In addition, there is to be a committee on co-operation with the industry in Canada. This program was approved by the executive committee. The thought behind the work of these new committees is that of a basic economic study of the several phases of community transportation in its broadest aspects.

E. F. Wickwire, sponsor of the manufacturers' luncheon during the last Cleveland convention, read a letter to President Barnes transmitting the suggestion made by resolution at the manufacturers' luncheon, for the appointment of a special committee of manufacturers to consider special manufacturing and trade problems within the industry. The executive committee passed a motion authorizing the president to appoint such a committee.

Those present at the executive committee meeting included President J. P. Barnes, J. H. Hanna, G. A. Richardson, L. S. Storrs, Barron Collier, R. P. Stevens, O. H. Bernd, L. F. Wynne, F. H. Miller, W. H. Boyce, A. S. Grenier, T. W. Casey, E. B. Meissner, E. F. Wickwire, D. W. Snyder, Jr., S. W. Shugg representing J. G. Barry, H. B. Potter, S. J. Cotsworth representing

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Carroll Burton, E. D. Kilburn, W. M. Wampler, W. H. Sawyer, A. W. Brady, W. S. Rodger, F. W. Doolittle, Charles Gordon, C. L. VanAuken, J. W. Welsh, Labert St. Clair, E. J. Murphy, F. C. J. Dell, G. C. Hecker, J. A. Miller, Jr., J. A. Vignec. The next meeting is to be held on Friday afternoon, Jan. 25, at Indianapolis at the time of the annual meeting of the Central Electric Railway Association in that city.

Virginians Discuss Utility Problems

MORE than 400 delegates representing almost every utility in the state of Virginia attended the annual meeting of the Public Utilities Association of Virginia, held at Roanoke on Nov. 21 and 22. Many interesting papers on utility relations with the public, investment banking views, urban transportation problems and rates were presented. Group luncheon meetings were held for the first time at this meeting of the association and, according to reports, proved very profitable. Another innovation was the formation of a woman's committee to assist and co-operate in all activities of the association.

Hon. William Meade Fletcher, commissioner of the State Corporation Commission, addressing the delegates at the opening session, spoke at some length on securing good public relations. He said in part:

> Public utilities by high efficiency, better service and more progressive policies should make their commodities useful and necessary to the public and thus win its confidence and good will, for good public relations are of the utmost importance to the successful operation of public utility properties. The dissatisfaction which arises from poor service by the public utility is one of the most frequent causes of an unfriendly public attitude.

Commissioner Fletcher voiced his opinion with regard to public and private ownership by saying:

> I am satisfied that as a general rule neither public ownership nor public operation is for the public's good nor desirable, and that private ownership and operation under proper regulation is the best system for conducting the business of public utilities.

The speaker stressed the need of proper employee attitude toward the patrons in establishing satisfactory friendly relations. He also mentioned the desirability of the utility securing more confidence on the part of the people in its good intentions and its desire to render good service. In support of this he said:

> Instead of a policy of concealment there should be the policy of honest revealment, and when this course is pursued honestly, fairly and with no misleading propaganda, no distortion of facts, no concealments or evasions, and the public is fully taken into the confidence of the utility and made to understand the nature of its business, the cost of conducting it, the effect of restrictions placed upon it, the part it plays in the life of the community and its needs and necessities, then the utility has gone far to establish better relations between it and the public and the way has been paved for a sympathetic attitude on the part of the public to its necessary requirements.

Views of an Investment Banker

Some aspects of the public utility business which are of major concern to investment bankers were reviewed by Henry R. Hayes, vice-president of Stone & Webster and Blodget, Inc., and former president of the Investment Bankers' Association of America. Mr. Hayes credited much of the stability of the public utilities to the efficient statewide regulations that have been responsible for the elimination of needless and destructive competition and that have prevented exorbitant rates. Supported by very uniform court decisions, he continued, this wise public policy of state regulation has afforded investors stability to such an extent that securities of the industry rank high among conservative investments. The speaker denounced those who were against state regulation and pointed out that their criticisms were general and without foundation. Mr. Hayes stated that more uniformity in commission regulation is essential to enable the operating companies to command a freer flow of money into the business for expansion.

The unfairness of charging only those who ride the cars and buses for the entire cost of financing and operating the transportation systems was pointed out by Tom P. Walker, vice-president Virginia Electric & Power Company. To use Mr. Walker's own words:

> Public transportation for people in mass is an absolute necessity for any city grown beyond the "one-horse" class. The butcher, the merchant, the manufacturer, the home owner and the worker are dependent on it directly. As a necessity this service is found to be supported, and we therefore have before us the definite problem of how to assess against each element of the population the cost of the service which that particular element enjoys. Under the theory established by many years usage, and at present in vogue, he who actually rides the cars and buses is expected to carry the entire cost. Franchises to operate transportation systems now require expensive hard surfaced streets which car riders are forced to pay for and which are of no direct benefit to them.

The speaker analyzed in part some of the traffic ordinances and suggested that provision be made for the speeding up of transportation vehicles. On this subject he said:

> If we are to halt the tremendous expenditures for widening streets to causeways and subways, we must certainly contrive to encourage the use of the more efficient bus or street car by allowing it to operate at an average speed, comparable with that of the automobile.

Other addresses delivered before the association included "The State Conservation and Development Commission," by Hon. William E. Carson, chairman of the State Conservation and Development Commission; "Your City and Your Business," by Colvin Brown, manager Commerical Organization Department of the United States Chamber of Commerce; "Fundamental Rate Base," by N. M. Argabrite, vice-president of the American Gas & Electric Company; "Industrial Development in the New Virginia," by J. P. Fishburn, president Virginia State Chamber of Commerce, and "Whither Public Utilities?" by Alexander Forward, managing director American Gas Association.

Three group luncheons were held during the noon hour of the first day. The groups were divided as electric light, power and telephone; transportation; and gas and water. Much interest was shown in a demonstration of "Televox," the Westinghouse mechanical man.

Women Form Auxiliary

The ladies in attendance at the convention met and formed an organization to work in conjunction with the association. Officers were elected and a definite program outlined. Several entertainment features were planned for the ladies in attendance, including a sightseeing tour, a luncheon, a bridge tournament and a buffet supper and dance.

A. W. Higgins, executive vice-president of the Virginia Public Service Company, Charlottesville, Va., was elected president of the association for the coming year. The vice-presidents named were C. B. Short, manager Roanoke Railway & Electric Company; T. Justin Moore, vice-president and general manager Virginia Electric and Power Company, and Herbert Markell, division manager Appalachian Electric Power Company.

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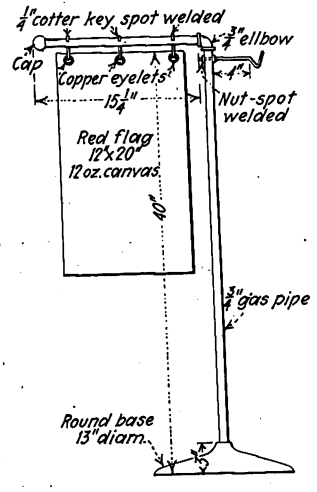
Short Cuts to BETTER

Sign Boards and Standards Improve Public Relations

AS A PART of its program to improve public relations the Northern States Power Company, Fargo, N. D., uses an attractive type of flag and lantern standard and a distinctive sign board. The flag and lantern standards are used at all



Type of standard used for red flag and red lantern display by the Northern States Power Company, Fargo, N. D.

obstructions in the streets. They are a distinct improvement over the red flag as displayed on a staff. With the new type of standard the flag is plainly visible at all times. A hook is provided for the lantern so that this is displayed much better. The neat arrangement of the standard also makes a better display of the work under way.

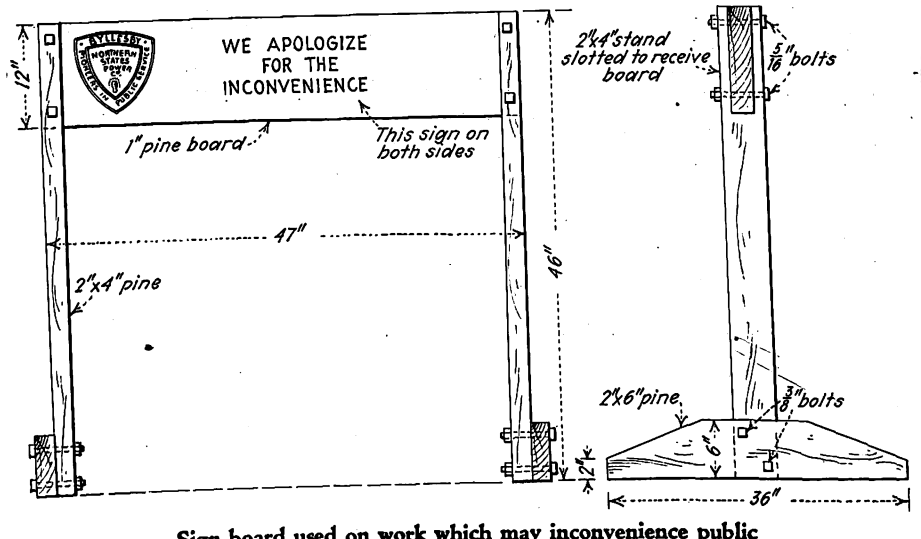
Sign boards are used on all work which in any manner may inconvenience the public. The top reads "We Apologize for the Inconvenience." The sign also bears the seal of the Byllesby organization. Many favorable comments have been received in regard to their use.

Painting Notes from Vienna

PLANS of the Vienna Tramways include the building of a cabinet for painting two cars at a time with nitro-cellulose paints. Compressed air will be introduced at the top of the enclosure with ample suction at the bottom so that the rapid carrying off of gases will make it unnecessary for the spray painters to use masks. The experimental cars will be treated in part with Duco and in part with a German product called "Glasurit," made by the Glasuritwerke of Hamburg.

For wooden surfaces, the management has under consideration a lacquer oil paint which will permit a car to go through the shops in six days instead of twenty-one, a very considerable saving.

Spray painting has already been applied on signs with stencil lettering. The stencil pattern is magnetized to stick on the plate during the spraying. After drying, the lettering can be brought up to enamel polish.

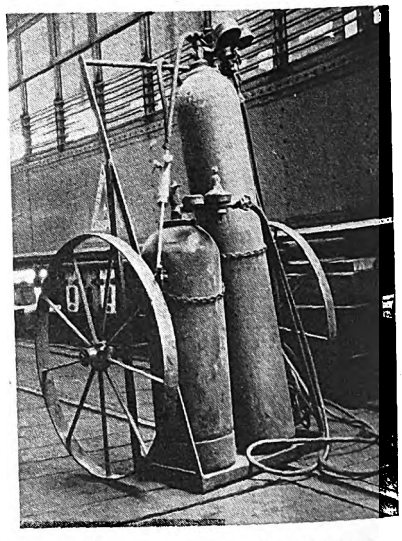


Sign board used on work which may inconvenience public

Large Wheels on Welding Truck

WHEELS of 10-in. diameter and 2-in. face were used originally on the acetylene outfit truck in the shop of the Richmond Railways, Inc., Staten Island, N. Y. When this outfit was taken about the shop as well as about the yard and inspection shop, trouble was experienced continually in moving it over small floor imperfections, rails, etc. In consequence, the services of two men were very often required to transport it. As this was expensive the truck shown in the accompanying engraving was designed and constructed.

The novel feature of this truck is in the diameter of the wheels used



Large wheels on this truck make it easy to roll over obstructions

and the fact that the wheels are raised from the floor when the tanks are in a vertical position. The platform is 24x14 in. and is made with a $\frac{1}{4}$x2-in. angle framework and $\frac{1}{8}$-in. floor plate. The joints of the plate and angles are welded. Two $\frac{1}{4}$x1$\frac{1}{4}$-in. vertical angles 39 in. high are welded to the back corners of the platform. Two $\frac{1}{4}$x1$\frac{1}{8}$-in. flat bars welded to each front corner of the platform extend backward to meet and project beyond the two rear vertical angles. A $\frac{1}{2}$-in. round rod, welded to the upper end

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MAINTENANCE

of these flat bars, provides a handle for moving the truck. Each front flat bar and back angle is welded at the meeting joint.

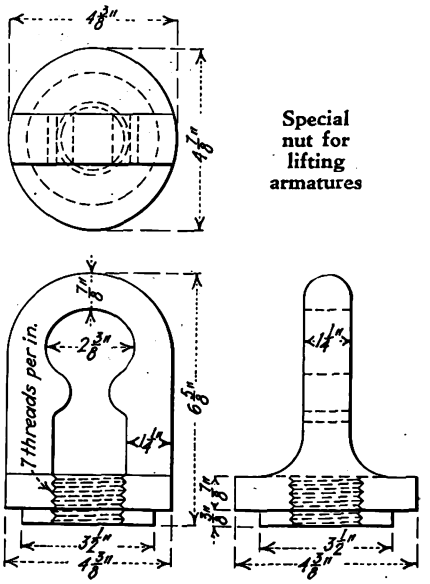
A 1¼-in. square axle is welded to the vertical angles 15¼ in. from the bottom of the platform. These axles are fitted with iron wheels of 30-in. diameter and have rims ¼ in. thick and 2 in. wide. The wheels are spaced 40 in. apart. When the truck is resting on the platform the wheels are ¼ in. off the floor. This prevents movement of the truck when unattended. A ¼x1¼-in. angle welded to the vertical angles strengthens the framework and provides a support for fastening the tanks.

This truck can be moved by one man and has thereby increased welding production and decreased labor.

Lifting Armatures with Pinion Nut Thread

THERE is always a possibility of an armature being damaged during its installation or removal from a field frame. Unless the utmost care is exercised, maintenance expense will be increased. The cars of the Staten Island Rapid Transit Railway, Staten Island, N. Y., are equipped with G-E, 282-A box frame motors. Several methods were tried for applying and removing the armatures from the field frames, and it was finally decided to perform this work with the frame in a vertical position. Motors are placed on the floor with the pinion end up, and the armatures are applied to or removed from the frame while in this position. The armatures are lifted by a special lifting nut designed and made in the shop.

This nut is screwed on to the shaft pinion nut thread. It is a steel forging with an oval base 4⅜x4⅞ in. and an over-all height of 6⅝ in. The base is ⅞ in. thick and the diameter of the eye is 2⅜ in. The base is designed with a projection ⅜ in. thick and with a 3½-in. diameter. The thickness of the eye material at the top is ⅝x1¼ in. and at the base 1¼ in. The oval base



Special nut for lifting armatures

and its projection are drilled and tapped to fit the pinion nut thread.

This method has been in use for some time and although the armatures weigh 1,650 lb. not a single accident has occurred.

Convenient Route Number Sign

By A. M. Lindsay

Superintendent of Rolling Stock
Montreal Tramways, Montreal, Canada

SEVERAL advantages are claimed for an inexpensive, adjustable type of route number sign used by the Montreal Tramways and shown in the accompanying illustrations. The principal features of this sign are:

1. Each curtain can be adjusted separately for position, giving a wide range of numbers. A coil spring on the curtain rollers keeps the face of the curtain tight and in the position where it is placed.

2. The back of the holder is of glass, so the route number is illuminated at night from the general car lighting.

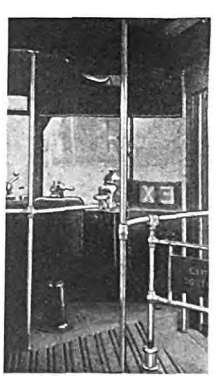
3. A self-locking spring catch keeps the back cover tight and prevents rattling.

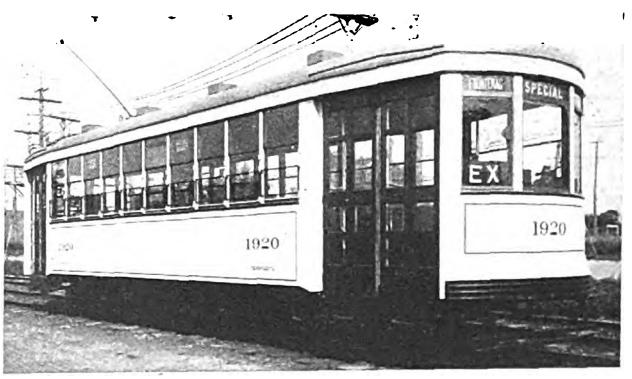
4. Curtains are inclosed completely and are kept clean and free from dust.

5. Slots in the ends of the case enable it to be placed in or removed quickly from suitable brackets on the window posts when repairs are necessary.

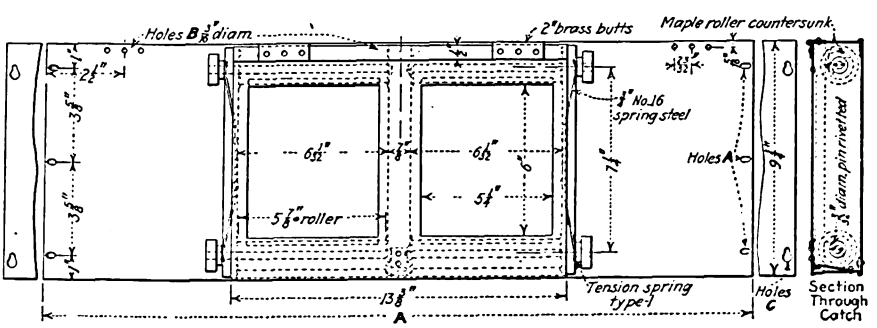
The cost of a complete sign is small, being approximately as follows:

Sign case	$3.00
Sign brackets and application	.25
Sign curtains	1.00
Total	$4.25





At left—View of the sign from the interior of the car.
At right—Exterior view of the sign



Construction of route number sign as used in Montreal

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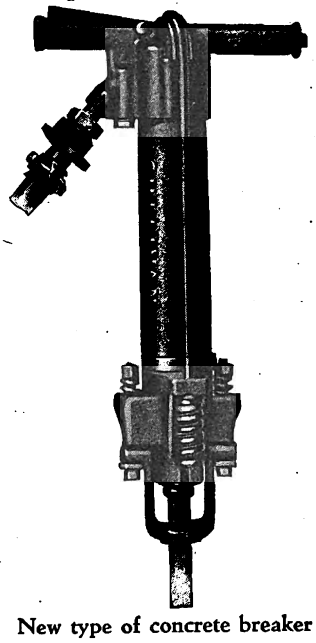
Helpful Equipment Suggestions

Powerful Type Concrete Breaker

FOR BREAKING concrete of heavy and difficult construction, a new type Sullivan K-3 concrete breaker is announced by the Sullivan Machinery Company, Chicago, Ill. This compressed air tool weighs 84 lb. and employs a cylindrical hollow valve for imparting the impulses of air to the piston. In the usual type



New type of concrete breaker

of service, air economy and excellent stand-up qualities are claimed for this machine as well as great power and penetration.

New Solder for Railway Motors

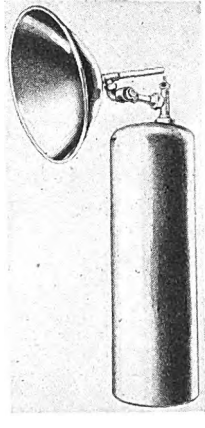
By James Silberstein
Chicago, Ill.

SOLDERS for electrical apparatus generally consist of lead and tin and start to melt at a temperature of 183 deg. C. A solder of higher melting point is desired for apparatus where the service is severe and high temperatures are encountered. Pure tin, which has a melting point of 232 deg. C. has therefore been used. The advantage of using pure tin is, however, not very marked and it has the disadvantage of being difficult to solder on account of its fluidity and tendency of "running through" joints.

Attempts have been made to develop new solders, standing higher temperatures, but they have so far been unsuccessful because of the rather severe requirements which have to be met by solders for electrical apparatus. Recently, however, an alloy has been developed which has proved its usefulness as a solder under very severe conditions. This alloy consists of lead as a base metal with additions of silver and copper, and starts to melt at a temperature of 302 deg. C. The alloy can be used in soldering with the non-corrosive fluxes, ordinarily employed in the soldering of electrical apparatus, and can be worked with a common soldering iron, which, of course, has to be heated to a higher temperature than when soldering with the ordinary lead-tin solders.

The new solder was put in service, and used successfully, on the electric motors of the locomotives of the Virginian Railroad. It was developed by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Floodlight Attachment



Floodlighting unit attached to tank

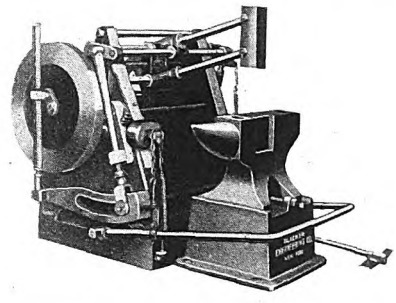
FOR USE with small tanks of dissolved acetylene the Prest-O-Lite Company, Inc., New York, N. Y., announces a floodlight attachment of new design. By the connection of the attachment a convenient, portable, powerful floodlighting unit is obtained which can be used for illumination in dark places and for facilitating night work of all kinds.

The improved attachment is of simple, strong, rigid and compact construction. Universal adjustment is obtained with only one swing joint, thus minimizing the possibility of leakage. Because of the substantial construction of the new part and because of its position near the center line of the tank, the attachment itself can be used as a handle in carrying the entire unit.

The reflector, which is of 10-in. diameter, can be taken off by removing a single knurled nut. A new type of burner is used which will not "carbon up." This burner is placed at a fixed focal point and requires no adjustment.

Improved Smithing Hammer

SEVERAL improvements are incorporated in the new Blacker "B" blacksmith hammer, recently placed on the market by the Blacker Engineering Company, New York, N. Y. While retaining the features



Improved type of blacksmith's helper

of preceding models, it is a larger and heavier machine throughout. Along with numerous dimension changes, thrust bearings are fitted to ease up the control mechanism, and a complete rearrangement of the motor drive gives a neat and compact unit.

A smith working at an anvil equipped with the improved hammer has directly under his control a sturdy, tireless helper swinging a sledge that can strike a blow three or four times as heavy as that of the hand swung sledge it replaces. He no longer has to signal with a small hand hammer to his strikers, and all confusion and misunderstanding are eliminated. The smith merely presses down the treadle with his foot and the sledge swings up and down exactly at the spot on the anvil that the smith selects and with his foot control he regulates the blow.

The control of the blow is positive. It passes from the treadle and chain through reduction gearing to the worm and quadrant action moving the quadrant arm. This is the same principle as the automobile steering gear and motion and shock from the working parts cannot carry back to the operator. The slipper in the link-motion drive is at dead center, or neutral, while the link itself rocks up and down with the eccentric action of the fly-wheel. Exactly like the locomotive drive, any movement of this slipper through the link results in a proportionate up and down motion of the driving rod, which in turn sets in motion the carriage and its hammer arms and head.

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News of the Industry

May Have to Increase Its Fare

An increase in street car fare in Cleveland, Ohio, is considered probable as a result of a drop in the interest fund of the Cleveland Railway below $500,000 during the months of September and October.

The Tayler grant states that a drop in the interest fund below $500,000 shall be considered as *prima facie* evidence of the necessity for an increase. The present rate in the city is 7 cents cash, eight tickets for 50 cents, with a 2-cent differential in East Cleveland and similar differential about to be enacted for Cleveland Heights.

The interest fund stood at $468,397 on Sept. 30. Officials of the railway expected that the seasonal increase in riding would build up the fund during October, but on Oct. 31 the balance was $468,139, according to reports made to the directors at their monthly meeting on Nov. 22.

The directors, however, made no move to bring about an increase in the rate of fare, believing that there will be a recovery in the interest fund during the winter.

Forward Step in Traffic Solution in New York

Mayor Walker, of New York City, has suggested that the Board of Estimate engage the professional services of Day & Zimmermann, engineers, to make a survey of the city's traffic conditions. Such was the central recommendation of the report of Mayor Walker's citizens' committee, and the Mayor himself has recently taken steps to carry it out. This commission would deal with all matters connected with the city's growth, and would naturally have much to say about the causes of congestion and its remedy. Distribution of population, balance of industry, recreational facilities, bridges, by-passes, arterial highways would be studied thoroughly.

Ordinance for Electric Power in Atlanta Abandoned

The attempt of the city of Atlanta, Ga., to compel railroads in its downtown district to use electricity as a source of power has been abandoned, at leat, for the time being. This became certain when the proposed ordinance, which would have made it a misdemeanor for any locomotive to "emit coal smoke or cinders" within the fire limits of the city, and compelled all railroads operating in the city to use electric locomotives, was withdrawn by its author, Alderman W. Guy Dobbs.

In withdrawing his ordinance, which already had the approval of a majority of the City council, Mr. Dobbs stated that it provided for the electrification of the railroads by Jan. 1, 1929, and that this was now a physical impossibility, due to delays in holding hearings and getting definite action on the proposition.

One hearing was held, after which the bridge committee, to which the ordinance was referred, asked that a special committee be appointed to study all phases of the city's smoke problem. The committee was appointed, and an ordinance had to be introduced giving it legal authority. Thus far the authority measure has not been presented to the Council.

After the special smoke committee makes its report it is probable that a new ordinance will be drawn up following its recommendations.

Telling Them How and Why in Nebraska

Management and employees of Omaha and Council Bluffs Street Railway show what a well-knit organization with perseverance and purpose can do for the common weal

DEEP gratitude has been acknowledged by the management of the Omaha & Council Bluffs Street Railway and the employees to the people of Omaha, Neb., for their award of the franchise which has been regarded as not only a vote for the franchise but "as a vote of confidence in the company and its employees." Through *Street Car Topics,* published by the company, the railway promises to prove worthy of the confidence.

The expiring franchise in Omaha was one of the problems which faced John N. Shannahan when he went to Omaha a year ago to re-establish the credit of a sick railway organization. In the emergency a large bond issue had either to be retired or extended. Arrangements were made with the bondholders whereby the expiration date was extended, pending an effort to secure a new franchise, and the management set about preparing the way to consummate that object.

An unusual means of taking his message to the public was conceived by President Shannahan in enlisting the aid of his platform men. From the ranks of the train service ten representatives were selected during August, and were given a course in public speaking under the direction of a competent instructor. The men were supplied with a prepared speech, setting forth their own and the company's position with regard to the proposed franchise and were required to memorize it, with such changes as would fit in best with their own command of the English language. Within a few weeks the speakers felt competent to make their first appearances.

The ten trainmen during the preliminary training period worked only part time on their cars and were compensated for all time lost. After the campaign got well under way they were relieved from their duties on the cars entirely, were furnished with brand new uniforms, which they were required to keep in first-class condition, were paid something more than their regular wages and were supplied with liberal expense accounts. They were now ready for an assault upon the luncheon clubs, the various local group meetings and any and every place where a suitable audience could be prevailed upon to listen to their argument.

After the regular list of luncheon clubs had been subjected to their oratorical fire the field of operations was broadened to include lodges, trades unions, business colleges and the like. One of the men appeared before the Omaha Women's Club, where he was well received and made a decided hit. Afternoon and evening card clubs were invaded.

To the People of Omaha

ON ELECTION day by a vote of 60,600 to 17,348, you gave us a franchise to continue to do business in the streets of Omaha.

The franchise was necessary for us to continue in business. The company's 1,100 employees, and the company itself, wish to acknowledge through *Car Topics* their deep gratitude to the people of Omaha.

However, we regard the fine vote as more than a vote for the franchise. We regard it as a vote of confidence in the company and its employees.

It is and will be our purpose to prove ourselves worthy of this confidence. We have been and are, to the best of our ability, giving efficient and courteous transportation service. Our purpose is to make this service constantly better. We welcome suggestions from the people of Omaha.—*Street Car Topics,* published by the Omaha & Council Bluffs Street Railway.

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During the final month of the campaign the scope of the meetings was broadened so as to cover many of the city's leading industrial establishments, department stores and factories. On one occasion the Union Pacific Railroad gathered 1,300 of its employees during working hours and allowed the trolley company's representatives twenty minutes in which to talk to them. Some of the trainmen made as many as four speeches a day. On Friday and Saturday immediately preceding the election two men went on the radio with their talk and in this manner reached hundreds who had not previously been addressed. In all, this group of trainmen addressed over 200 gatherings and spoke to an estimated total of 18,000 people.

Women Not Overlooked

On election day, in addition to two men in uniform at each of the 176 precincts in Omaha and Council Bluffs, there was one woman, the wife, sister, mother or sweetheart of some male employee, each wearing a ribbon labeled "Street Railway Employee."

In spite of active opposition, led by United States Senator R. B. Howell and supported by a considerable and active element in both cities, the franchise carried by a vote of 60,600 in favor as opposed to about 17,000 against. The motion for the proposed free bridge over the Missouri River was defeated, but by a vote somewhat less decisive.

As the result of the election and of the spirit which was aroused among its employees the Omaha & Council Bluffs Street Railway finds itself with a 30-year franchise, with its credit restored, and with the way cleared for the sale of its toll bridge to the city, instead of a threat to build a free bridge in competition. The company can now proceed to carry out its long delayed plans for securing new rolling stock, constructing new substations and rehabilitating certain of its cars. Immediate results have been the engaging of experts to conduct a traffic survey, which is expected to result in a number of changes for the better in the routing of its cars, and a group insurance arrangement whereby each employee is given a life insurance policy for $1,000, the premium of which is carried by the company.

Above everything else that the company counted as gain as the result of its campaign for the franchise, was the strengthening of the morale of its entire force of employees. This was especially true of the train force. Not only did they take a new pride in themselves and in their vocation but they raised themselves in the estimation of the general public. In the eyes of the business community the trainmen are something more than mere automatons; their entire status has been improved. As one observer sees it they have won for themselves a new prestige. They have shown the people of Omaha and of Council Bluffs that they are a power to be reckoned with in the community. By their efforts they have established the company upon a new and improved basis. It is now in position to go forward and do its full part in the development of these growing cities. It is freely admitted that without the whole-hearted support of the employees this happy result could never have been accomplished.

Snag in Decatur's Argument

Five of the six judges on the Supreme Court of Georgia have declared themselves disqualified for consideration of litigation between the city of Decatur and the Georgia Power Company over Decatur's 5-cent fare contract, and argument has been postponed. Judge Marcus W. Beck was the only member of the court who declared that he was qualified to hear the case. Both sides were willing to waive the disqualifications set up by the other justices, the reason for which was announced as ownership of stock in the company by near relatives, which operates as a bar under the law, but the judges themselves refused to sit in the case.

The case involves a franchise entered into by the city of Decatur and the Georgia Power Company in 1903 for the taking over of the Decatur street car line. It has been the center of litigation for a number of years. A clause in the contract provided that Decatur should never be charged more than a 5-cent fare. Abrogration has been sought in vain through both court channels and legislative enactment, and on two occasions the case has come before the United States Supreme Court.

The present litigation originated in 1925, when the company notified the city of Decatur that it had surrendered it franchise and would remove its tracks. The city then secured and injunction in the De Kalb Superior Court, and this decision is before the Supreme Court of the state for review.

Akron Set to Negotiate New Franchise

Committee turns in report in which it finds 7.7-cent are necessary. Present average fare is 6.51 cents. Buses and cars each carry about 20,000,000 a year

THE Citizens' Fact Finding Committee at Akron, Ohio, selected to study the city's transportation system, has presented its report to Council, after several months' work. The committee finds that a fare of 7.77 cents is necessary if the Northern Ohio Power & Light Company is to receive a rate sufficiently high to pay operating expenses, maintenance, depreciation and taxes, and a 7 per cent return upon the valuation of the property.

Filing of the report with Council marks the first step in the negotiations between the city and the company for a franchise to take the place of the temporary franchise which expires in February.

Under the present franchise the company is getting an average fare of 6.51 cents, the reports shows. The present fare is 7 cents cash, four tickets for 25 cents, and seventeen tickets for $1. The committee does not recommend an increase in fare to the figure named in the report, upon the theory that a heavy decrease in riding would follow to a point which would give the company only a 3 per cent increase in actual fare. The increase necessary to pay all charges is 18 per cent.

The committee made a study of 25 cities throughout the United States. In cities where the fare has been increased steadily over a period of years, the gross revenue of the company, the report declares, has remained almost stationary instead of increasing. In other words, as the fare went up, the number of riders went down.

The report presents to Council six valuations. These valuations range from $6.262,364, arrived at by the historical cost less depreciation reserve method, to $8,643,207 valuation arrived at by the reproduction cost less retirement only method.

That the automobile has provided the most relentless kind of competition for transportation companies is shown in figures on auto ownership for Akron. The report discloses that there were 13,600 automobiles in the city of Akron for 1918, or one for each 13.75 persons. In 1928 there were 63,566, or one auto for each 4.75 persons.

Remarkable Growth of Bus Business

Other outstanding points in the report show that on the basis of present fare, net revenue of the company is showing marked improvement for 1928. The bus system, started in 1922, will carry more passengers in 1928 than the street car system. The first year the company operated buses it carried 2,004,297 passengers as against 33,894,113 on the street cars. In 1927 the buses carried 19,038,134 persons while street cars carried 20,519,101. By the close of 1928, the buses will have carried several hundred thousand more passengers than the street cars for the year. The street car system is shown to be on a sound economic basis, but losses pile up on bus operation. Drastic economies on the bus system are suggested to aid in solving the transportation problem. In striking an average, the committee finds that the reasonable net revenue for the year should reach $3,230,992 to pay operating costs, taxes, interest on bonds, dividends and provide fair depreciation reserve.

The report shows that there was $187,014 applicable to depreciation and return in 1927, and that in 1928 the figure will reach $224,654. This amount should be $723,393, to put the trans-

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portation property on a justified earning basis.

The report contains 150 pages and goes into the transportation system in an exhaustive manner. Besides the summary, written by Harold McGee, director of the bureau of municipal research, the report includes a section on court decisions on valuation and rate of return of electric railways by Edwin W. Brouse, attorney. Mr. Brouse is secretary of the committee. The report also contains an analysis of franchises by legal members of the committee. It contains an accounting study, by H. C. Miller, L. W. Dalton, and William L. Post; an analysis of prior appraisals, by Post; the physical appraisal of the company, by Prof. Henry Riggs, appraisal expert of Ann Arbor, Mich.; a historical cost of the system, by Post; capital securities, by H. C. Miller; an analysis of operating incomes and expense, by Mr. Dalton, and a section on the economics of car and bus fares, by H. L. Newhall. It is expected that negotiations for the new franchise will begin during the week beginning Dec. 2.

The Northern Ohio Power & Light Company, the city officials, the committee of citizens, and the newspapers are urging an early settlement.

Small Town Problems to Be Studied

Difficulties of electric railways in small towns and what can be done to alleviate them will be the subject of study by a committee of the American Electric Railway Association during the coming year. This committee on "small town operation," of which A. C. Spurr, general manager Wheeling Traction Company, is chairman, met at association headquarters on Nov. 26. The subjects to which particular attention will be paid are method of financing new car purchases, relief from paving burdens, possibilities of reducing the cost of purchase power and the conditions which may make it desirable to substitute buses in place of cars on small systems. Members present at this meeting were: A. C. Spurr, chairman; J. S. Bleecker, L. F. Gillett, A. H. Gossard, L. W. Heath, William M. B. Lord, C. A. Meyer, F. A. Persons, C. W. Stocks, representing R. E. Plimpton and J. H. Pritchard.

Chicago Honors Fallen Heroes

Electric transportation companies serving Chicago and the entire metropolitan area joined in paying tribute to the nation's fallen heroes on Nov. 12, when the tenth anniversary of the signing of the Armistice was generally observed. Traffic came to a complete halt for one minute at 11 a.m., on the Rapid Transit Lines, the Chicago North Shore & Milwaukee Railroad, the Chicago South Shore & South Bend Railroad and the Chicago, Aurora & Elgin Railroad while the employees of the four companies faced east in silent tribute to the dead.

Buglers from Chicago Elevated Post No. 184, American Legion, sounded taps from four "L" transfer bridges in the Loop just as traffic came to a halt at 11 o'clock. All rapid transit cars and the transfer bridges on which the buglers are stationed were decorated in the national colors.

Midwest Association Meeting Scheduled

Plans have been made to hold the midwinter meeting of the Midwest Electric Railway Association at the Robideaux Hotel, St. Joseph, Mo., on Feb. 7 and 8.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Dec. 3-7 — American Society of Mechanical Engineers, 49th annual meeting, 29 West 39th St., New York, N. Y.

Dec. 7 — Metropolitan Section, American Electric Railway Association and Metropolitan Section, Society of Automotive Engineers, joint meeting, 33 W. 39th St., New York, N. Y.

Dec. 10-12 — National Highway Traffic Association, annual meeting, Automobile Club of America, New York, N. Y.

Jan. 14-18, 1929—American Road Builders' Association, convention and road show, Cleveland, Ohio.

Jan. 22—New York Electric Railway Association, mid-winter meeting and dinner, Hotel Commodore, New York, N. Y.

Jan. 23-25—Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.

Jan. 24-25—Central Electric Railway Association, Claypool Hotel, Indianapolis, Ind.

Jan. 25-26—Central Electric Railway Accountants' Association, Claypool Hotel, Indianapolis, Ind.

Jan. 28-Feb. 1—American Institute of Electrical Engineers, annual convention, 33 W. 39th St., New York, N. Y.

Feb. 7-8—Midwest Electric Railway Association, Midwinter meeting, Robideaux Hotel, St. Joseph, Mo.

Feb. 14—Central Electric Railway Master Mechanics' Association, Youngstown, Ohio.

Sept. 28-Oct. 4—American Electric Railway Association, 48th annual convention, New Public Auditorium, Atlantic City, N. J.

Engineering Executive Committee Meets in New York

Completion of the personnel of all standing and special committees of the American Electric Railway Engineering Association, with the exception of one or two committees in the Purchases and Stores Division which are expected to be completed in the near future, was announced by President F. H. Miller at a meeting of the Engineering executive committee held at association headquarters in New York on Nov. 22.

Progress in the work of the committee on revision of committee rules was reported by W. W. Wysor. The secretary reported approval by letters ballot of the following committee reports: way and structures—committee No. 4, track ballast and drainage; committee No. 5, wood preservation; committee No. 6, arc welding; committee No. 7, alloy steels for special trackwork; power—committee No. 5, catenary specifications; committee No. 7, radio interference; committee No. 12, ferrous versus non-ferrous materials for overhead lines; rolling stock— committee No. 1, engineering manual; committee No. 5, bearings; committee No. 6, lubrication; committee No. 9, noise reduction. In addition to these, the reports of way and structures committee No. 11 on track construction, No. 14 on rail markings, and No. 16 on special trackwork foundations, were approved at this meeting of the executive committee. The reports of way and structures committee No. 2 on special trackwork and No. 8 on track pavement were referred back to these special committees.

Time limits for the completion of all special and standing committee reports were established. Progress in co-ordinating the work of the several associations engaged in the study of the various phases of heavy electric traction was reported. A recommendation by the committee of judges in the Electric Railway Journal Maintenance Contest, that the annual company award, the individual capital prize and the departmental certificates of merit be made a part of the general engineering sessions at the convention was approved. P. V. C. See was appointed to represent the association in a proposed conference on a uniform motor bus specification code. A report was made that negotiations are still under way for a conference with representatives of the National Machine Tool Builders' Association looking to a study of the economies to be obtained by application of modern shop machinery in the electric railway industry.

Those in attendance at the meeting included President F. H. Miller, presiding; F. McVittie, C. H. Jones, P. V. C. See, W. W. Wysor, H. H. George, E. M. T. Ryder, H. F. Brown, A. T. Clark, C. R. Harte, Charles Gordon, C. L. Van Auken, A. W. Baker and G. C. Hecker. President J. P. Barnes of the American Association visited the meeting for a brief period to explain proposed changes in the convention program designed to facilitate the work of the affiliated associations.

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Detailed Traffic Survey Planned

Executive committee of Philadelphia Chamber of Commerce endorses suggestion of Mitten Management to go thoroughly into matter

MITTEN MANAGEMENT'S offer to make a detailed survey of traffic conditions in Philadelphia and to prepare a complete city traffic plan, was accepted on Nov. 27 by the executive committee of the Philadelphia Chamber of Commerce. The offer of the management, which operates the Philadelphia Rapid Transit Company, to undertake a study of local conditions was made several days earlier by Joseph A. Queeney, vice-president of Mitten Management in charge of operation.

Need for treatment of this kind for the traffic problem has long been felt in Philadelphia and there have been periodic agitations for a comprehensive engineering survey of street conditions and requirements throughout the metropolitan area. Mr. Queeney, in presenting the plan of Mitten Management to the executive committee of the Chamber of Commerce, pointed out that his organization has had fiftten years of experience in giving transportation service over the city streets and that no group of engineers could come into Philadelphia and secure the facts or acquire the knowledge possessed by the transportation management, without long and intensive study.

It was proposed that this wealth of information be gathered together, supplemented by studies of the immediate conditions, shaped into a practical plan and subjected to the comment and criticism of every individual or organization that may be in the slightest way affected.

The plan will embrace city-wide traffic control, including the operation of all public vehicles; a parking plan; a scientific signal light system; the construction of new streets or the widening of others if found necessary and practical; the elimination of grade crossings; the study of accidents; and everything else that in any way involves the right of the citizens to obtain the safest and most convenient use of the streets. Among other things Mr. Queeney said:

> Our plans have been developed to the point where we now need the co-operation of the business men of our city. We want, for example, to have several merchants conduct checks at their stores and places of business, so as to develop just how their customers reach their places of business. Do they come by private automobile, leaving their cars parked at the curb, or do they park in some nearby garage; or do they come by subway, surface car, bus, or taxicab, or do they walk? Once these facts are determined to the satisfaction of the merchants, we will have no difficulty in deciding whether it is necessary to have our valuable street space occupied by parked cars. If it is true that parking cars on our public streets is necessary, or desirable, then we will provide for such parking in our plans of traffic control.
>
> When this plan of ours is completed we suggest that you call in the representatives of every interest affected, and let them measure it by their own problem. That goes for the motorist organizations, the trucking companies, the steam railroads, the city highway department, the utilities which have conduits in the city streets, the merchants, the manufacturers, etc. Traffic relief means so much to all of these people that a comprehensive plan, satisfactory to all, should quickly be arrived at as a substitute for the chaos existing today. Then, with your endorsement (the endorsement of the executive committee of the Chamber of Commerce) the plan will be submitted to the Mayor's traffic commission.

At the time that the Chamber of Commerce group approved the suggested plan of Mitten Management, it also recommended that members of the City Council should investigate traffic conditions in other cities at first hand. The resolution approved by the committee was as follows:

> The traffic committee of the Philadelphia Chamber of Commerce has repeatedly urged that a comprehensive survey of the traffic conditions in Philadelphia should be made by an independent traffic expert, to be employed by the city. However, as the city has failed to provide the funds to employ such an expert, we approve the offer on the part of Mitten Management, Inc., to make a survey and, when completed, will give it careful attention."

Denver Employees Pay Election Bets

SOME of the employees of the Denver Tramway, Denver, Col., who voted for Governor Al Smith, were forced to wait until the first snow storm to pay their losing bets. Accordingly, on Nov. 17, attired in straw hats and with corn cob pipes in their mouths, they straddled broom sticks and raced down Sixteenth Street waving banners which explained what it was all about. They insisted that "We are still for Al."

Would Restrict Parking in Chicago

In an effort to speed up traffic during morning and evening rush hours an ordinance has been drawn for presentation to the City Council of Chicago which would restrict parking to only one side of the street on all thoroughfares where there are street car lines. In the morning peak period, parking would not be permitted on the right side of the street carrying city-bound traffic; and in the evening parking would be prohibited on the right side of streets bearing outbound traffic. The ordinance would apply only to those streets having car lines.

City traffic experts agree with Alderman A. K. Mose, who is sponsoring the measure, that the ordinance would be a great benefit to the many thousands of downtown workers who use the trolleys in traveling to and from their homes. They also point out that neighborhood stores are often closed during the morning rush hours and that they do little business during the homeward rush at night. Alderman Mose believes that the ordinance would not only speed up street traffic but would materially decrease the number of accidents.

Developments in Cuyahoga Subway Project

The mysterious Cuyahoga Subway Company, which is seeking franchise rights in Cleveland, Ohio, has placed in circulation a new set of petitions for an initiated ordinance, revealing some of the details of the company's plans which heretofore have been carefully guarded. The company is asking a 50-year franchise for the operation of underground, surface or elevated lines on practically every main thoroughfare in the city.

Sponsors of the franchise said that every conceivable route was described in the proposed ordinance, with the idea of allowing the City Council ample room for selection.

No announcement was made as to the amount of money the company is prepared to spend. Banking connections are not known and, with the exception of M. F. Bramley, wealthy paving contractor and amusement park owner, identity of the officers of the company has not been disclosed.

The supposition that the Bramley project is apparently to be hooked up in some way with the Pennsylvania Railroad is backed by the stipulation in the grant that the first route is to be built in Superior Avenue, East Fourteenth Street and a point 1,000 ft. west of the Pennsylvania Railroad bridge, near Superior and East 40th Street. The ordinance also states that the Superior subway is to be the only one having four tracks. All other routes are limited to two. The ordinance provides:

Fare definitely fixed at 10 cents within the city for the first ten years, after which either the city or company could appeal to a board of arbitration or the Ohio Public Utilities Commission.

Free transfers.

Excise tax to be paid annually to the city after 1940, based on ten per cent of the gross passenger revenue less taxes.

Construction to start one year from effective date of the ordinance.

Overhead construction to require the approval of the director of public service. In streets now occupied by Cleveland Railway Company tracks, the approval of the railway also to be required.

Superior route and 4 miles additional of routes to be in operation within three years after construction starts.

Trains to be operated over not less than 5 miles additional of routes in each succeeding four-year period.

Failure to provide service within time limits to give Council the right to revoke franchises on routes not started, "but the company shall have the right to maintain and operate the then existing routes during the life of the grant."

Subway commissioner to be appointed by the city manager.

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Proposed New York Legislation To Affect Transit Board

Bills to reorganize the New York Transit Commission to make it really a division of the Public Service Department will be introduced at the next session of the Legislature under Democratic auspices. The proposed legislation will reserve to the Transit Commission, now legal and then to be actually the metropolitan division of the Public Service Department, only the regulation of capitalization, rates, service, equipment and operation of common carriers within New York City, except baggage and express companies.

It will transfer to the City Board of Transportation, according to the terms now proposed, elimination of grade crossings within New York City, the carrying out of the proposed plan of unification or readjustment of the city's transit lines, which has been prepared by the present Transit Commission and Samuel Untermyer, its special counsel, and the administration of the dual contracts with the Brooklyn-Manhattan Transit Company and the Interborough Rapid Transit Company.

The city administration also will have a transit legislative program, and the bill to create a Transit Authority to carry out the readjustment plan also will be introduced again.

New Rapid Transit Line in New Jersey Will Need 11-Cent Fare

An average fare of 11 cents will pay operating charges and retire construction costs on the proposed Newark-Paterson-Hackensack rapid transit line, according to an announcement made by the North Jersey Transit Commission Nov. 27, following the compilation of operating costs details by the commission's engineers. The average fare necessary to make the line self-sustaining at the end of the fifth year of operation is estimated at slightly more than 7½ cents. It is estimated that traffic will total 25,000,000 passengers for the first year of operation, which it is said could be 1933, and will have increased to 50,000,000 passengers at the end of the fifth year of operation.

Ten-Cent Cash Fare in Baltimore

The United Railways & Electric Company, Baltimore, Md., has been granted a fare increase by the Maryland Public Service Commission to 8¼ cents, when tickets or tokens are purchased, with 10 cents for single cash fares. The new rates became effective on Dec. 1 and are an increase from 9 cents cash or three tokens for 25 cents. Officials of the United sought a flat 10-cent fare but this has been denied. Whether the company will again take the case into the courts in an effort to obtain the straight 10-cent fare has not been determined.

This latest action by the Public Service Commission was a result of a ruling by the courts, which remanded the case for further consideration. In fixing the rate of fare the court ruled that the commission should have based its depreciation allowance on present value instead of cost of depreciable property.

Discussion Goes on in Chicago

Elevated, surface lines and city's opinions aired on rate of return. Will consider legislation for a fixed return

ALTHOUGH much progress has been made in recent weeks toward arriving at an agreement on the proposed unification ordinances and new franchises, representatives of the Chicago elevated and surface lines and members of the City Council local transportation sub-committee are still far apart on the question of how much the rate of return to the new company should be. At a joint discussion held on Nov. 26, the companies insisted upon their original proposition of a return of 6½ per cent on the initial capital invested plus one mill per revenue passenger carried, while the committee proposes to allow only a 5½ per cent return plus the compensation feature. A compromise figure of 6 per cent on initial capital value, with all new money to go in at cost (estimated at 5½ per cent) plus the one mill per revenue passenger, was suggested by City Engineer R. F. Kelker, Jr., but it was received by the company representative without comment.

Leonard A. Busby, president of the Chicago City Railway, declared that he could see no reason for modifying the original proposal, considering the fact that the courts and utility commissions have granted to utilities rates of return higher than 7 per cent.

Rate of Return an Issue

It is the city's contention, however, that the 6½ per cent return asked by the companies plus the compensation feature is about 2 per cent more than they have obtained in the last twenty years. "On the capital account the surface lines have earned an average of about 6.2 per cent for the period, and the elevated lines much less," asserted Mr. Kelker. "As an average they have earned about 5 per cent, while now they ask a total of nearly 7 per cent.

The city engineer questioned the logic of allowing a return of 7 per cent on new capital when the money would cost probably only 5 or 5½ per cent. In addition to agreeing to a return of 5½ per cent on all money now invested, plus one mill per passenger, the city proposes to pay the entire cost of new capital.

Mr. Kelker further pointed out that the companies seek the privilege through the local commission of changing the fares to meet the rate of return. "This means a perpetual franchise under the guise of an intermediate period," he explained. He met the companies' objection to a fixed rate of return by asserting that the 1907 surface lines ordinance provided for a fixed rate, as did also the 1918 and 1925 ordinances.

The companies and the Aldermen were also in disagreement as to whether interest shall be paid upon the city's $53,000,000 traction fund if it is invested in the bands of the new unified company. In support of their contention that such an investment should draw no interest, attorneys for the companies point out that the fund was created by the car riders under the 1907 ordinance and if interest is to be paid the car riders will be paying for the use of their own money. The city, on the other hand, maintains that the interest should be paid, insisting that if it is not the stockholders will be receiving free use of the money. In addition, the city argues, whatever interest is earned will be used for the benefit of the car riders in the construction of subways, extensions or the reduction of fares.

Instead of investing the traction fund in bonds of the new company, P. J. Lucey, attorney for the Chicago Rapid Transit Line, suggested that it be used for the construction of downtown subways, pointing out that unless additional terminal facilities are provided in the Loop district, the entire traction settlement plan will be worthless. Mr. Kelker took the position, however, that it would be futile to build subways until the elevated lines have entered into a contract to use them.

Members of the sub-committee decided to hold a special meeting to determine whether they will try to obtain legislation authorizing a contract ordinance with a fixed rate of return. Attorney Lucey contended that no such contract legally could be made.

Agitation of Rapid Transit in Detroit

At the spring election the Detroit Rapid Transit Commission will submit to voters a plan for a four-line subway system costing $280,000,000. Mayor John C. Lodge has also declared steps to oust the Detroit Motor Bus Company from streets will be taken after holidays, the city taking over the lines. The Rapid Transit Commission asked to plan downtown subway dips for trolleys, available later, as part of the subway system. This plan would be submitted as alternative to the subway system.

Payment for Suggestions in Fort Wayne

Suggestions are being sought from all employees of the Indiana Service Corporation, Fort Wayne, Ind., which would improve the workings of any department of the company. They are to be written out, identified by number only and dropped into a suggestion box. Awards will be made to all except heads of departments. The committee, including Robert M. Feustel, president, will judge the submitted suggestions and determine the awards to be made.

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Survey in San Francisco

City experts to complete by Jan. 1 presentation upon which it plans to base Market Street purchase

THE recent campaign in San Francisco in which the question of granting an indeterminate permit to the Market Street Railway was an issue was one of the most stoutly contended in San Francisco for a long time. Proponents painted a gloomy picture of chaotic transportation conditions should the measure be defeated. To offset any alarm that may have been caused by the discussion, Samuel Kahn, president of the Market Street Railway, has issued this statement:

We will continue to do our best to serve San Francisco even though we are somewhat handicapped.

Further than that he declined to discuss the company's plans.

In reviewing the defeat of the measure Major Charles H. Kendrick, chairman of the Citizens' Committee against amendment 24, urges the establishment of an understanding between the Market Street Railway and the city government. He is quoted as follows:

Now that the campaign is over, city officials should reach an understanding with the railway looking toward a solution of the transportation problem that faces San Francisco. The Market Street Railway deserves a fair deal from the city and an adjustment of the difficulties between it and the city should be arrived at with the thought uppermost of a square deal for all concerned.

Supervisor Havenner, chairman of the finance committee of the board and one of the leaders in the fight against the measure, said:

There is being made by the force of City Attorney O'Shaughnessy a survey and valuation of such properties of the Market Street Railway as will be of utility to the city in its ownership of the entire street car system within its limits. This survey should be completed by the first of the year.

Meantime the Public Utilities Committee of the board is considering the situation with relation to the action the city shall take when this valuation is before it. Just what plan will be decided upon has not been determined. I have no authority to speak for the committee, but I believe that, as the problem seems to be one of finance, the voters will be asked to approve a bond issue enabling the city to purchase the privately owned street car systems.

Another solution would be to make arrangements to purchases the properties on the pay-as-you-go plan. This, should it prove acceptable to the owners, probably would mean the paying of a higher price than were the purchase outright.

Should no plan be arrived at when the franchises begin to expire, I feel certain that the companies would be willing to continue operation on a sufferance agreement until such time as is necessary. This arrangement also would be in effect, I believe, in case a bond issue were defeated, and the pay-as-you-go plan should not meet approval.

The Supervisors have been accused in the campaign just ended of neglecting their duty in the railway situation. I feel that such accusation was unjustified. The bond issue of first consideration was that providing for the purchase of Spring Valley. At that election it was deemed inadvisable to place another major issue on the ballot, and it was deemed inadvisable to place it on the ballot at the election just ended. This would have been the case had there been a purchase price agreement.

I believe the survey and valuation of the railway properties now under way will establish a reasonable price for the California Street Cable Railway and also for the Market Street line. I see no cause for any alarm in the situation.

Seattle Moves Toward Settlement

Every possible economy being put into effect on municipal railway pending the development of a real program. Leasing of the railway for private operation being advocated

AT LEAST two far-reaching rival programs for the solution of Seattle's involved transportation problem probably will be submitted to a vote of the people next March, unless the combined ingenuity of the City Council, Mayor Frank Edwards and George B. Avery, superintendent of city utilities, with the aid of leading citizens, is able meantime to cope with the situation with facilities already at hand.

One of the proposed plans involves public refinancing with a bond issue for the rehabilitation of the railway and its reorganization and development along modern rapid transit lines.

The other plan advocates the leasing of the railway and the granting of an exclusive long-term taxicab franchise to go with the lease to private operators who will merge the two services into one transportation system. An arrangement of this kind is now being sought by private capital, represented by Karl H. Kaye, whose proposal is being considered by the Mayor and Council.

Under the refinancing and bonding plan, it is stated, a program designed to anticipate Seattle's development for many years would be outlined, with a view to speeding service to and from the downtown district by the aid of elevated tracks, subways and other innovations. It would provide for lighter, more comfortable cars, lower operating and maintenance costs and further economies by cutting out unprofitable car routes and bus lines, city officials declare.

The leasing plan would contemplate the payment of the present railway debt, rebuilding of many of the present car lines, equipment of the system with new cars, and extension and improvement of service for the city as a whole at private expense. Further proposals are expected shortly from Mr. Kaye, applicant for the street railway system lease and taxicab franchise. Mr. Kaye said:

Acceptance of our proposal will mean the rapid rehabilitation of the entire railway system, at private expense, so that it will give the adequate and efficient service demanded of it, and without which the growth and progress of Seattle is being retarded. It will remove, probably for all time, danger of laws being so amended that resort may be made to a general property tax to support the operation of the municipal railway, and it would accomplish this without the sacrifice of the municipal ownership principle, for the city would still own and control the system under our plan.

We have asked for a taxicab franchise along with the railway lease, because the railway cannot be made profitable without control of the taxicab competition and because taxicab service profits are needed to compensate for losses on parts of the present system, and on new extensions that may be necessary in different sections of the city.

In the meantime G. B. Avery has been proceeding with the overhaul of the municipal railway. This involves sharp reductions in personnel and extensive rerouting of car lines designed to effect an annual saving of $350,000 in operating costs. Initial steps taken involved the release of three veteran subordinate officials: Edward E. Mitchell, supervisor of traffic; S. E. Goodwin, supervisor of power; and Robert Nesbitt, assistant supervisor of power. Other dismissals, including at least seven of the fourteen railway inspectors, are expected to follow. Before starting his reorganization program, Mr. Avery took the precaution to assure himself of Mayor Edwards' backing and of a policy of non-interference on the part of the City Council utilities committee.

Establishment of a new uptown street car loop around one block, perhaps two blocks, near the center of the retail district, with transfer points at all corners; curtailment of left-hand street car turns, and use of more one-man cars are other probable developments of the near future. Adoption of these features would effect greater economy and speedier service in the railway department and bring about relief for the growing congestion of traffic in general through the downtown business district, it is declared. Parking of automobiles probably would be forbidden in the blocks forming the new loop, but through automobile traffic would be speeded on all four streets, with street car patrons protected by a well-guarded safety zone extending completely around the loop.

Another feature being considered is the resumption of the skip-stop system abandoned during the administration of former Mayor Bertha K. Landes. More split routes and shorter runs are also favored. A return to the skip-stop system would reduce by nearly one-half the street car stops in the more thickly settled residence districts, it is declared, allowing traffic to move along with correspondingly less interruption, and would be a move toward relieving motor traffic, which is becoming increasingly

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congested and exceedingly complicated.

In the meantime, Seattle taxicab men have been granted a respite in a projected campaign by the city utilities department to compel the use of taximeters on all taxicabs, in place of zone systems and special rate plans under which many of them are operating. This announcement is in harmony with the decision of the City Council franchise committee to hold in abeyance rival negotiations of Sam V. Taggart for an exclusive taxicab service franchise, for the same reason.

While the various problems are being considered, the residents of Beacon Hill must also wait for their proposed extension from the present terminus at Spokane Street and Beacon Avenue to Beacon Avenue and Columbian Way, although the petitioners have presented to the utilities committee a written guarantee to make up to the city any discount which might be exacted on street railway bonds necessary to finance such an extension.

Claims Executive Committee Meets

For the purpose of discussing arrangements for the 1929 convention the Claims executive committee met at association headquarters on Nov. 21, with President L. F. Wynne in the chair. Decision was made to designate the special committee which had been appointed to study Mr. Kubu's suggestion as the "committee on uniform negligence law." It was tentatively agreed that the Claims Association meet at 2 o'clock on Monday afternoon of convention week; that an informal luncheon be held either Tuesday or Wednesday, depending upon which day was reserved to inspection of exhibits, and that final session be held at 2 p.m. Thursday.

The sub-committee on subjects reported no progress, but was instructed to include among its scheduled papers one on the advantage of attendance of claims adjusters at the convention on account of the value of personal contacts made there. A sub-committee reported that copy for the Proceedings had been edited and passed for publication. The committee will meet again Jan. 24-25 at Indianapolis, upon the occasion of the mid-winter meeting of the C.E.R.A. Those present were L. F. Wynne, president; C. A. Redfern, J. W. Giltner, Seth Baldwin, W. E. Robinson, Trevor Nielson, W. F. Weh, W. A. Foley and Wallace Muir.

New Franchise Ordinance in Bluefield Proposed

A proposed ordinance which would give to the Tri-City Traction Company a new franchise and declare null and void three other grants now held by the company in Bluefield, W. Va., has been submitted to the board of directors. It was explained that one of the three franchises held by the company expires in 1933. The purpose is to enact a blanket franchise covering all the lines that will materially benefit the company.

Safe Operation Rewarded in Illinois

Fifteen motormen and bus operators of the Champaign-Urbana railway and bus line division of the Illinois Power & Light Corporation recently received bonuses of $5 each for completing 270 hours operation without accident of any nature.

The Copper Country Sticks to Its Street Cars

In the copper country of Michigan, where the snow piles high in the winter, making walking anything but a pleasure, citizens are not inclined to think lightly of the service provided by street cars, says the Duluth (Minn.) *Herald*, in commenting on the fact that every city in the district has voted to renew a franchise to the Houghton County Traction Company permitting it to operate on a 30-year writ. Here is the account from the *Herald:*

An attempt has been made for the last three years to keep state highways open to wheeled traffic in the winter season and remarkable success has been attained. There are times, however, when all the snow-fighting equipment in the Upper Peninsula would be unable to keep the highways between Copper country towns open.

When a 40-mile wind sweeps out of the Northwest, carrying snow so thick it blocks visibility like a heavy fog, the snow piles up faster than it can be moved aside. Five minutes after a tractor plow snorts its way through drifts to open a lane the road is blocked again. In cases of this kind Copper country people have one way of getting around their country and that is by street car. Street cars in the Copper country run constantly and are ready for all kinds of weather.

In the depression which swept this district a few years ago when thousands moved to other industrial centers of the Middle West the business slumped and the Houghton County Traction Company went into the hands of a receiver. Conditions are on the uptrend again and business is picking up with the carrier. The enthusiastic approval given at the polls recently instills new ambition and confidence in the firm.

Fact-Finding Committee for Omaha Bridge Proposal

Mayor Dahlman of Omaha and Mayor Greene of Council Bluffs have named committees of business men to meet with President Shannahan, of the Omaha & Council Bluffs Street Railway, for the purpose of determining what is a fair price for the bridge across the Missouri River. The bondholders have told Mr. Shannahan that they are prepared to sacrifice private ownership of the bridge for the public good, but that in return they expect a fair price.

The joint committee is first instructed to inquire as to the price and conditions upon which the present bridge can be purchased, as well as the terms by which the railway lease upon it can be bought; to collect information as to the cost and present purchase value of the bridge, together with information as to cost of maintenance and operation. It is also to find out what revenues may properly be expected after purchase, and from what source. It is also to determine the kind and cost of a bridge between the two communities, if it develops that a new one must be erected to serve as a free bridge.

The Omaha newspapers are backing the proposal for purchase of the old bridge, and say the people are willing to pay a sum slightly more than a new bridge would cost, but that the people are not buying an investment, hence the present owners should not take any possible profits into consideration. Mr. Shannahan is said not to anticipate any particular trouble in getting an agreement as to that price when all the facts are made known.

Christmas for Atlanta's Children

Youngsters of the Georgia Power Company, Atlanta, Ga., will receive a Christmas present through *Snap Shots*, the official paper of the company, if they are under twelve years old and write a letter telling Santa what their happiest Christmas was. Pictures of the letter writers are being solicited by *Snap Shots* for early publication.

Placing the Burden Where It Belongs

Richard Palmer, a student in the law school of Denver University, has been awarded first prize in a national contest conducted by the Phi Delta Phi legal fraternity, for his essay, "Stop, Look, Listen." Among the salient points of that essay are:

There was a time when liability for grade crossing accidents rested almost entirely on the railroads, and the courts imposed heavy damages on them when a train struck a carriage or one of the early one-lunged "gas buggies." With the development of the automobile it became apparent that arbitrarily to blame the railroad was not just. Gradually the judicial view of such accidents has changed and the trend of recent decisions is to hold the motorist accountable for his own mishap.

In developing this view, the courts have taken account of the difficulty of stopping trains quickly and of the fact that motorists now approach grade crossing with full knowledge that they should "Stop, Look, Listen."

Half Fare Plan for Worcester Children Abandoned

Although officials of the Worcester Consolidated Street Railway, Worcester, Mass., at one time considered adopting a half-fare strip ticket for children during the vacation months similar to that tried in Springfield, Mass., the past summer, it was decided that the children's transportation problem at Worcester in the summer was not comparable to that in the sister city. Between 70,000 and 80,000 tickets were sold to children during the summer in Springfield, but officials there are not yet certain if the plan has been a financial success.

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Recent Bus Developments

De Luxe Service Proposed in Jacksonville

Permission is to be sought by the Jacksonville Traction Company, Jacksonville, Fla., to operate a de luxe express bus service from Murray Hill and Avondale, into the downtown district. A petition detailing how the company will operate the buses is now being prepared and will be sent to the Council.

Four new buses, the very latest in the city type, will be purchased immediately after Council authorizes the operation of such service.

As indicated in a recent issue of ELECTRIC RAILWAY JOURNAL, negotiations between the city and the company looking toward a new franchise are expected to be resumed shortly.

The bus fare will be 10 cents cash. Transfers will be issued to the car lines, and passengers paying the 10-cent cash street car fare will be transferred to the bus line. Murray Hill passengers who desire to use the reduced rate of 7 cents or the weekly pass will be transferred to and from the Murray Hill car line at the Murray Hill terminal. The buses now used as a feeder to the present end of the Murray Hill car line will be withdrawn.

The buses will operate express between Park and King Streets and the downtown section, with stops only at Five Points, the union depot and Broad and Adams Streets. The downtown terminus would be at Forsyth and Laura Streets. The buses would run "local" beyond King and Park Streets.

The buses will operate every twenty minutes, from 6 a.m., until 10 a.m., and from 4 p.m., until 9 p.m., and every 30 minutes from 10 a.m., until 4 p.m., and from 9 p.m., until 1 a.m., except on Saturday and Sunday. A regular twenty-minute schedule will be maintained all day on Saturday, from 6 a.m., until 1 a.m. A 30-minute schedule will be maintained on Sunday, from 7 a.m., until 8 p.m., and an hourly schedule, from 8 p.m., until 1 a.m.

Canton-Youngstown Rights Sought

Petitions and protests are keeping the Ohio Public Utilities Commission busy these days since the Youngstown & Suburban Transportation Company abandoned part of its bus route between Canton and Youngstown on Nov. 1.

It was with permission of the state board that the Youngstown & Suburban withdrew its buses between Canton and Salem, a run of 33 miles, and joined the Stark Electric Railroad in furnishing double service over this line. At Salem, cars which leave Canton on the hour connect with Youngstown & Suburban buses for Youngstown. Formerly, there was only two-hour service between Salem and Canton.

Hardly had the buses stopped running before the Warren-Salem Coach Line and the Salem-Akron Transit Company applied to operate over part of the abandoned line. These petitions were followed by the Michele Transportation Company asking a permit to operate between Youngstown and Canton.

Both the Stark Electric and the Youngstown & Suburban lines are protesting the issuance of new certificates. No definite action has yet been taken by the state board on any of the petitions or protests.

Taxes and Insurance Matters of Moment in Iowa

Attorneys for Iowa bus lines, which have been waging a long legal battle against the ton-mile tax recently upheld by the Iowa Supreme Court have filed a petition for a rehearing, which is scheduled for Dec. 12. The high court ruled on Sept. 28 that Judge W. G. Bonner, of the Polk County District Court, was right in his decision that the law does not discriminate against the motor carriers with fixed terminals and routes.

The petition attacks the constitutionality of the law. It raises the question of whether the measure does not discriminate between motor carriers by turning over the highways to one class of users for profit, with immunity from taxation, while denying the same immunity to others using similar types of vehicles. It is contended by the petitioners that, unless the court can find an actual distinction in the "wear and tear" on the Iowa highways, the motor carriers operating between fixed terminals should not be charged a ton-mile tax, while other motor carriers, operating for profit without definite routings, are allowed to use the roads free of tax.

Indications are that the Legislature will take up the whole question again at the coming session in an attempt to levy a general tax on all privately owned buses and trucks operating over the highways for profit. The amount of back taxes involved in the court proceeding is $66,000. Approximately $52,000 of this sum is assessed against Mrs. Helen Schultz Brewer, head of the Red Ball Transportation Company of Mason City, long known as the "Iowa Bus Queen."

Another matter, which is likely to go before the Iowa legislature at Des Moines this winter, is a request to change the motor vehicle law, so as to define more clearly the liability of insurance companies writing liability insurance bonds on the motor carriers which come under the provisions of the law. This question was brought to the attention of motor vehicle owners and insurance men of Iowa recently, when the Black Hawk County District Court interpreted the motor vehicle law as assuming unlimited liability on the part of insurance companies, in cases where riders on passenger buses are injured.

This interpretation, it was pointed out, would make the insurance companies writing the bonds, responsible for any amount of damages which a jury might see fit to award in a personal damage case against a bus transportation concern. For a time, the companies holding the major portion of the bonds on Iowa's motor carrier companies threatened cancellation of the policies. W. A. Lawrenson, state agent for the Underwriters Service Company, declared no company could afford to take the added risk at the amount of the present premium. However, after consideration, it was decided to leave the situation in *status quo* and await possible action by the Legislature or the appeal of a case to the Iowa Supreme Court. The insurance companies can still cancel upon ten days' notice, it was said.

Failure of the Iowa bus companies to get bonds would automatically put a stop to motor vehicle transportation of passengers, as filing of a bond is a prerequisite to operation in this state.

Proposal of Knoxville Company Still Pending

The City Council of Knoxville, Tenn., will oppose before the Railroad & Public Utilities Commission any petition filed by Knoxville Power & Light Company to increase its token fare charge from 6 to 7 cents.

Agreement to this effect was reached in an adjourned session of the Council held to consider the most recent proposal of the company relative to instituting bus service in areas not now served by railway lines and the relinquishing of its private right-of-way in Kingston Pike west of the Louisville & Nashville Railroad overpass.

To represent the Council in any proceedings the Power & Light Company may bring for the purpose of increasing its present token fare. Mayor James A. Fowler has appointed Messrs. Wright, Monday and Fretz.

Schenectady to Scotia by Bus

Abandonment of the electric railway to Scotia, N. Y., from Schenectady is expected to bring about a bus service to the village, application for which has already been filed with the Scotia Village Board by the Schenectady Railway Bus Lines, Inc., a subsidiary company of the Schenectady Railway. A similar application has been filed with the Schenectady Common Council, asking the city's permission to operate the bus service to Scotia from the railway's waiting room on State Street and from the General Electric Company terminal.

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Bus Service to Replace Detroit's Jitney's

General Manager Del A. Smith has proposed a system that makes faster time, he claims, and will be cleaner, more comfortable and more dependable than the old jitneys

NINE routes have been designated by the Detroit Department of Street Railways to be traversed by the new de luxe motor coaches which the department has ordered to replace the jitneys, ruled off the streets under the recent decision of the Michigan Supreme Court. It is the intention of the Department of Street Railways to have 160 sixteen-passenger de luxe buses in operation by Dec. 15.

Four of the lines planned will replace the former jitney lines while others will run into new territory not previously served by jitneys. The lines first mentioned will be operated on or parallel to Woodward, Grand River, Jefferson Avenues and Fort Street. Two of these lines the general manager expects will be in complete operation by Dec. 1.

Eighteen of the new coaches have arrived and were placed in operation on Woodward Avenue line on Nov. 25. The fare announced is comparable to that of the former jitneys: 10 cents from downtown to Webb Avenue; 15 cents from downtown to Highland Park; and 20 cents from downtown to the Six Mile Road.

The Woodward Avenue line will extend from Palmer Woods, its outer terminus, to downtown, operating part of the way over Cass and Second Avenues. The Jefferson Avenue and Fort Street lines will operate over those thoroughfares. The outer extremity of the Jefferson line will be at Wayburn Avenue and of the Fort Street line at Woodmere Cemetery.

The Grand River Avenue line will run for a part of the distance over Ash Street, West Grand Boulevard, Milford, Beechwood and Woodside Avenues, hitting Grand River Avenue at a point south of Livernois Avenue. This will increase the distance by ¾ mile, but it is believed that better time will be possible because of the lighter traffic to be encountered.

The other routes planned have not been served by jitneys. They will include the following lines: out Grand River Avenue to Linwood Avenue, following Linwood Avenue to the Six Mile Road; out Brush Street and Oakland Avenue to the Eight Mile Rd.; from Gratiot Avenue and the Seven Mile Road to Gratiot and East Grand Boulevard, thence downtown via the Boulevard. Verner Highway, McDougall Avenue and Macomb Street; out Lafayette Avenue east, Van Dyke Avenue and Warren Avenue; out Congress Street, Mt. Elliott and Mack Avenues.

The line to operate from the downtown section out Porter Street and across the new Ambassador bridge to Windsor, Ontario, will not be started immediately over any part of the route but will depend upon the date of completion of the new international bridge.

While the Department of Street Railways is proceeding with the purchase of new buses and street cars to care for all the traffic handled by the jitneys, some of the downtown merchants advocate that the jitneys be permitted to return to the streets to operate on a day-to-day agreement. Edward N. Barnard, attorney for the jitney organizations, has submitted to the City Council the following propositions:

1. That the jitneys operate as they did in the past under a day-to-day agreement, the city having power to put them off at any time.

2. That the city rent the jitneys for 12 cents a mile, providing the city agrees to pay for a minimum of 100 miles a day of operation.

3. That the jitneys operate under any other plan the city proposes.

The Council is to hold a hearing within the next few days to consider Mr. Barnard's proposal.

An Observer's Idea of the Situation

The personal opinion of an observer in Detroit is that the way the city put the jitneys out of business as soon as it had authority is the best and most creditable thing it has done for a long time. Of course, there have been many protests, but a good many of them appear to have been inspired by the former jitney operators. Perhaps the railway department was not as well prepared as it should have been to handle the increased load from the jitney riders, but had there been any temporizing, the jitney men might have, by some hook or crook, sought to continue to operate indefinitely. The best thing was to get rid of them as soon as possible. That is what happened.

So far as the newspapers are concerned there is nothing consistent about their policy and they appear to go from one side of the fence to the other very easily and frequently. Aside from the competitive situation among them, they appear to adhere to the policy of criticizing anything done by the city department when there is half a chance. There now appear to be two other important reasons, other than the withdrawal of the jitneys, for the concern of the downtown stores about the ability of people to do their Christmas shopping. It is intended that stores recently erected by the great mail order houses in outlying sections shall carry the complete catalog items as sold by mail. The policy is to place them at the halfway point, that is far enough downtown so that there will be a considerable urban population beyond the stores. Still the stores are far enough out so that they can have space to park 800 cars at the back of the store building. As a matter of fact, the downtown merchants admit their selfish interest in seeking to make it easy for people to get downtown. They have no figures, no definite information, only a general idea that the demand has greatly increased. If there is any possible way in which the merchants can secure more transportation downtown, they want it, regardless of the difficulty of handling the peak due to a combination of shoppers and workers, regardless of any effect that the added service will have on the financial conditions of the street railway department, and almost regardless of who furnishes the service, except that no one seems to want the Barnard crowd after its six years of fighting the city.

To the mind of the observers on the ground it is not so much the trolley as the Detroit City Administration that deserves criticism. The city has grown so tremendously in recent years that a subway system is sadly needed to handle the heavy transportation downtown. This is out of the question for several years to come, and longer unless the city administration bestirs itself, so the job must be done by cars and buses. In this connection a representative of the Retail Merchants' Association appears to have got at the heart of the difficulty when he said that the nine members of the City Council had been in politics for a number of years and think they are experts on any problem that may come up before them. Instead of taking the advice of experts, the members of the Council are accustomed to use their own small knowledge. Hence, when Dell Smith, manager of the Municipal Railway System, wanted to order several hundred more buses two or three months ago, and put on a de luxe service that would really compete with the jitneys, his suggestions were frowned upon and nothing was done until the jitneys were actually removed. Still the size of the jitney traffic appears to have been over-rated. If the jitneys averaged 80,000 a day, during September and October, they were doing pretty well. But Detroit is booming, the Employers' Association reporting 285,000 men at work on Nov. 1, compared with 200,000 at the similar period last year. The figures cover only the members of the association, but it is said that, by adding 50 per cent, a good picture is presented of the total employment in Detroit.

At first no one could believe that the

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jitneys would stop operation. For six years they had weathered every legal storm, with the city always winning in court and always being prevented by appeal or other legal maneuvers from capitalizing on its victory. The jitney men had submitted their case to the voters at a city election in the fall of 1926, but their proposal to repeal the regulatory ordinance was defeated by a considerable majority.

Rumors of last-minute jitney coups were abroad. The cars were to be used as taxicabs, or no fares were to be collected, the patrons being permitted to make voluntary contributions. But the city went ahead promptly and decisively. On Friday, Oct. 26, the Supreme Court decision had been recorded and was presented to the Circuit Court, which thereupon dismissed its injunction.

A few of the jitney men threatened to continue running even after the injunction was lifted, but most of them took the order seriously, in fact, very seriously, the announcement of the city authorities that no more tickets would be handed out, but that jitneys violating the ordinance would be seized and towed to the city pound. This action was actually taken by the police authorities in the case of three jitneys operating to one of the suburbs. Their owners defied the ordinance in the belief that it did not cover the suburban operators. The service to the suburbs involves a distinct problem, which is considered later in this article.

At the time the Supreme Court decision was put into effect, about 1,000 jitneys were being operated on the city streets. Only about 500 of these were involved in the six-year legal proceedings. The others were newcomers, usually referred to as "wild cats," that began to appear during June and July of the present year. The general scheme was to follow a route that led into some important downtown point where regular loading points with starters were established. Starters were also maintained at the outlying terminals to control the drivers, establish spacings, and exercise general supervision. Parking space was available at the outlying terminals, but downtown the jitneys would often be making a circuit on nearby streets and waiting their turn to get into the stand and pick up passengers.

Just what caused the influx last summer is difficult to explain. A number of reasons have been advanced by those familiar with the situation. It was known even in the spring that the Supreme Court would hand down its decision in October. Most people believed that it would be in favor of the city. Perhaps this suggested the idea of making hay while the sun was shining. Another factor, possibly, was the increased activity in the automobile factories. These were employing about 40 per cent more than last year, thus greatly increasing the load on all the transportation facilities and suggesting a field for other services, no matter how small or humble.

Now that the forces of law and order reign triumphant, what is going to happen? The way is clear, it appears, for the city to administer the ordinance. While excluding jitneys from certain main thoroughfares, parks and boulevards, this gives the Mayor authority to issue or revoke jitney licenses on the other streets of the city. The Supreme Court decision said that the Mayor had the right to grant or withhold licenses for proper cause. This cause is not defined in the ordinance, which merely makes it discretionary on the part of the Mayor to issue or revoke the licenses. Obviously, he has complete control of the situation. In exercising this control the corporation counsel, the police department and the Department of Street Railways have already been called upon for their advice and consent.

Because they had taken steps to obey the ordinance, thirty jitneys were granted permits early in October. These are still running on Hamilton Avenue, from Library Square downtown to the southern limits of Highland Park. The route parallels to a large extent one of the D.S.R. trolley lines. Under the ordinance not more than one passenger can use the seat beside the driver. Stops to load or unload must be made at the far side of street intersections, and within two feet of the right hand curb. The jitneys are forbidden to cut ahead of "any other driver, motor bus or any vehicle for hire, in order to pick up a passenger when both vehicles are within 100 feet of that passenger."

Once the jitneys were removed, additional service was put on by the Department of Street Railways. It rented 40 trolleys from the Eastern Michigan Trolley System (formerly of the Detroit United Railways) and 24 from the Cleveland Railway. New trolleys are being purchased, but the trouble is that the tracks in the downtown district have almost reached their capacity during rush hours. More transportation is clearly required, with fair consideration given the many riders who honestly believed the jitneys provided the fastest, cheapest and, in many respects, the most comfortable transportation in the city of Detroit.

In enforcing the jitney ordinance the police made no distinction between the city and suburban variety. Before the fateful Oct. 26, 100 or more jitneys were thriving on the cream of shopper and commuter traffic. Like the city jitneys they were depending on parallel bus and car lines to furnish the regular service and to carry the greater part of the traffic.

Financial *and* Corporate

Review of Von Herberg Suit Denied

The United States Supreme Court has denied the Puget Sound Power & Light Company review of a suit against J. G. Von Herberg and the city of Seattle, in which the Circuit Court of Appeals ruled against the company on a jurisdictional point. Mr. Von Herberg, owner of $100,000 in city warrants, sold to pay for operation of the municipal street cars, claimed priority in the gross revenues of the street car system, and the Puget Sound company brought suit to insure its claims for payment from the revenues. In effect, the decision upholds that of the Circuit Court of Appeals at San Francisco, which on Sept. 19 held that the matter was not a proper one for the federal court, but must be tried in state court.

This decision means that Mr. Von Herberg is now free to press his litigation in the Superior Court, and his attorney, Robert P. Oldham, announces that the suit will be pressed to trial at the earliest possible date.

Would Suspend Service in Santa Barbara

The Santa Barbara & Suburban Railway has applied to the Railroad Commission for authority to discontinue operation of its street railway service in the city of Santa Barbara, Cal. The company sets forth in its application that despite the action of the Railroad Commission last January in granting it an increase in fares to 10 cents, with a weekly ticket selling at 25 cents that entitled the holder to ride for an additional 5 cents, the revenues of the lines have been insufficient to warrant their continuance. Two lines in the city of Santa Barbara cover a total mileage of 11.5 miles.

Improvements in Toledo Affairs

Following a gain of $30,000 in revenue in September the Community Traction Company, Toledo, Ohio, increased this to $45,000 gain in October compared with the previous year and kept its record of turning in a surplus from operations every month this year so far. These facts are disclosed in the report submitted by Commissioner E. L. Graumlich to the street railway board of control at its meeting on Nov. 14. October revenue was $324,341 compared with $277,923 for a similar month in 1927. There were 4,173,447 revenue-passengers carried. Operating expenses were $219,680 including $42,796 for maintenance. Taxes were $17,205 and after depreciation, interest, and adjustments for power refund there was a net surplus of $25,249 for the stabilizing fund, bringing the deficit to $1,151,624 and the fund reserve for purpose of fare regulation to $60,625. No downward revision of fare will be possible until this fund reaches a $500,000 level. This is possible in about eighteen months under the present rate of progress.

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Railway operation produced $265,615 in revenue while the coach operations brought in $57,249. Coach operations now show a slight profit.

The ten months of 1928 show a gain of more than 2,000,000 car riders over a similar period in 1927.

Elimination of independent bus competition, better employment conditions, more economical operation, and relief from sinking fund charges all contributed to the better showing.

New Third Avenue Director

At the annual meeting of the Third Avenue Railway, New York, N. Y., Nathan L. Ottinger was elected a director to take the place of Alexander S. Webb, resigned.

Puget Sound Passes to Engineers Public Service

Charles W. Kellogg, president of the Engineers Public Service Company, states sufficient common stock of Puget Sound Power & Light Company has been deposited or pledged and sufficient preferred stock and proxies are on file with Puget Sound company to effect consummation of plans for acquisition of control of the Puget Sound company by the Engineers Public Service. The deposit period expired on Nov. 16.

Loss by Schenectady Railway on Quarter's Operation

The Schenectady Railway, Schenectady, N. Y., reports to the New York State Public Service Commission for the quarter ended Sept. 30, 1928, net loss of $61,401 after charges, compared with net loss of $36,688 in the corresponding quarter of 1927.

Fewer Passengers in Kansas City

The Kansas City Public Service Company, Kansas City, Mo., reports a loss of 84,694 car fares and 20,643 bus fares for the week ended Nov. 4, compared to the corresponding period last year. The total loss in revenue was $8,027, a decrease of 4.65 per cent. The total decrease reported since Jan. 1 now totals 3.94 per cent for a total of $300,632. Since Jan. 1, 1928, 3,302,067 fewer persons have ridden the street cars and buses than during the first ten months of 1927.

Net Income Lower on Brooklyn City

For the four months' period ended Oct. 31, 1928, passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., was $3,676,522, as against $3,694,735 for a similar period ended Oct. 31, 1927. Operating expenses and taxes advanced from $3,249,352 to $3,296,095 for this year. After income deductions the net corporate income for the four months' period of this year was $309,684, compared to $351,593 for the four months ended Oct. 31, 1927.

Legal Notes

CALIFORNIA—*Injury to Alighting Passenger by Sudden Start of the Car.*

The act of a conductor, although done while in service, cannot bind the street railway if it does not fall within the scope of his duties. A street car was stopped in front of an approaching railroad train because of a motor truck stalled in front of it. The conductor called "everybody off." At the same time the motorman started the car, and a passenger attempting to alight was injured. It was held that the conductor acted within the scope of his employment, and there was concurrent negligence on the part of the conductor and motorman, which was the approximate cause of the passenger's injury. [Little vs. Los Angeles Ry. Corp., 121 P., 134.]

ILLINOIS—*Right of Elevated Railway to Allow Use of its Tracks to Another Company.*

By virtue of their charter and the assent of the city and abutting property owners, the elevated railroads in Chicago became vested with property rights in their right-of-way as completely as though the grant had been made directly by the state. Consent of the city and abutting owners is not necessary to the validity of an operating agreement by which the company permitted another railroad to use its tracks for passengers and freight traffic, in view of the provisions of the Public Utility Act. Such use did not constitute an additional burden on the streets where no additional obstructions were placed in or over them, and no limitation existed on the number of cars to be run on the track. [Chicago N. S. & M. R. Co. vs. City of Chicago, 163 N.E., 141.]

IOWA—*Motor Vehicle Tax Upheld.*

The 1927 Legislature passed a motor vehicle tax by which commercial vehicles, whether freight or passenger, were taxed one-fourth of 1 cent per ton mile if equipped with pneumatic tires, and one-half of 1 cent per ton mile if equipped with solid tires. The law explained the method of determining the tonnage. The tax was attacked as unreasonable and discriminatory, but was upheld by the Supreme Court of Iowa. [Iowa Motor Vehicle Association vs. Board of R.R. Com., 221 N.W., 365.]

MISSOURI—*Duty of Automobile Passenger To Warn Driver.*

An automobile passenger's negligence in permitting the driver to cross the track ahead of an approaching street car without protest is proper for submission to the jury, though the instructions of the trial court that such a passenger could not recover from the railway if the collision was caused solely by the driver's negligence was held to be erroneous. [Shumate vs. Wells, 9 S.W. (2d), 632.]

MISSOURI—*Skidding of Bus Is Prima Facie Evidence of Negligence.*

When a bus skidded and hit the curb and a passenger was thrown out of her seat and injured, a *prima facie* case of presumptive negligence arose under the *res ipsa loquitur* rule and was aided by the defendent's evidence, so that the case was properly submitted to the jury. It would be most unfortunate, in view of the extent of modern motor bus transportation, if a motor bus carrier, in the event of injury to a passenger by the overturning or wrecking of a bus, or by collision, deprived the passenger of the benefit of this rule by showing that the accident was occasioned through the skidding of the motor bus and thereby escaped liability for injury. [Heidt vs. Peoples M. Co. of St. Louis, 9 S.W. (2d), 650.]

MICHIGAN—*Pedestrian Should Know That Rear of Street Car Will Overhang When Car Rounds a Curve.*

Pedestrians are presumed to know that a street car will overhang at its rear end when rounding a curve. Hence, the motorman of a car is not bound to keep watch of the overhang, but may discharge his duty by looking ahead. [Hering vs. City of Detroit, 221 N.W., 278.]

OHIO—*Collision With Automobile Without Tail Light.*

Although an automobile driver was negligent in leaving his automobile on a highway without a tail light, he can recover damages to his car when struck by a street car, unless his negligence was the approximate cause of the injury. [Columbus R. P. & L. Co. vs. Pickles, 162 N.E., 614.]

SOUTH DAKOTA—*Mandamus Legal Remedy to Compel Companies to Pave.*

A company's franchise required it to do certain paving, and the city received judgment for a writ of mandamus. This was held proper, though if the defendant was entirely unable to defray the cost of the paving, a procedure in the nature of a *quo warranto* might be the proper remedy. The plea of the company that the city should pave, then bring suit to recover cost was rejected. [City of Sioux Falls vs. S. F. Traction Co., 221 N.W., 84.]

VIRGINIA.—*Right to eject an invalid transfer upheld.*

A passenger received from the conductor of the car on which he paid his fare a transfer punched for 5:45 p.m. instead of 3:25 p.m. When he attempted to use the transfer on another car, it was rejected because it was improperly punched, and he was ejected. His suit for damages for ejectment was not allowed. [Virginia E. & P. Co. vs. Brown, 144 S.E., 708.]

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Personal Items

E. J. Pearson Resigns from New Haven

Edward J. Pearson has resigned as president of the New York, New Haven & Hartford Railroad. Ill health is given as the cause of the resignation, which will be effective on Dec. 31.

Mr. Pearson became head of the system on April 24, 1917, succeeding Howard Elliott. He had been with the New Haven only about a year when he became its president.

He was born in Rockville, Ill., in 1863, of New England ancestors. After his graduation from Cornell University, Mr. Pearson served with several Western railroads. While in the West he developed the first "hump" freight yard on the Pacific coast. Later, when he came to the New Haven, one of his achievements was the building of the large railroad classification yards at Cedar Hill, Conn.

Mr. Pearson came to the New Haven as vice-president, having been called from the Texas & Pacific, of which he was vice-president. A year later he became president. During the war he was federal manager of the road when the system was taken over by the government. Since 1920 the road has shown a steady increase in net earnings and dividends were resumed on the common stock, the first payment of the kind made since 1913.

During his career in the West, Mr. Pearson was connected with the St. Paul, the Missouri Pacific and the Texas & Pacific railroads. He constructed terminals in St. Louis, Kansas City, New Orleans and Chicago.

With regard to the probable successor of Mr. Pearson, Edward G. Buckland, vice-president of the road, has been mentioned as the most likely candidate.

E. M. Bassett to Plan New York City's Zoning

Edward M. Bassett has been appointed to the city planning post by Mayor Walker of New York City. The new appointee has a long record of public service activities. In 1922 he was appointed by Secretary Hoover as a member of the advisory committee on zoning. His term of office as a member of the Public Service Commission of the first district of New York expired in February, 1911. His greatest service to the commission, the ELECTRIC RAILWAY JOURNAL said some time ago, was in connection with framing the new rapid transit law and in pushing the elimination of dangerous grade crossings. Since 1902 Mr. Bassett has been connected with the law firm of Bassett, Thompson & Gilpatrick

In announcing the acquisition of the services of this zoning expert, Mayor Walker said it was a step toward the foundation of a permanent planning commission for the city. He added that the new commission when organized would study the present situation regarding zoning of all boroughs, and attempt to work out a plan for the future development of the city.

F. J. Gannon Assumes New Duties in El Paso

F. J. Gannon has assumed his duties as manager of the El Paso Electric Company, El Paso, Tex. He succeeds Joseph Bowes, who, as noted previously in ELECTRIC RAILWAY JOURNAL, goes to the Virginia Electric & Power Company.

Mr. Gannon was formerly at Davis Island, at Tampa, Fla., where he held the position of vice-president of Davis Islands, Inc., a firm organized for the development of the islands of Tampa Bay. He has been in the public utility field for the past 26 years and has an exceptional record to his credit.

After completing school in 1902, he started out in the general offices of Stone & Webster, Inc., and since that time has been continually with companies under that firm's management.

After four years of training he was sent to Dallas where he became connected with the Light, Power & Railway Company, later being connected with the Pawtucket Electric Company, Pawtucket, R. I. His first step to an executive position occurred in 1910 when he was sent to Brockton, Mass., as assistant treasurer of the Edison Electric Illuminating Company, and a year later to Reno, Nev., as assistant treasurer of the Reno Power, Light & Water Company and Truckee River Power Company, serving gas, electric light, power and water.

By this time Mr. Gannon had so well established himself in the utility field and demonstrated such rare executive ability that in 1916 he was selected to fill the position of assistant treasurer with the Northern Texas Traction Company at Fort Worth. While he was in Fort Worth, so marked was his broad experience and unusual ability as an executive that when Stone & Webster took over the development of the Davis Island project Mr. Gannon was selected to serve as assistant treasurer, since a man of unusual financial and executive experience was needed. He served only one year in that capacity, and was then made vice-president of the undertaking.

When Mr. Gannon went to Davis Island the construction program was in its infancy and he served in his usual efficient manner. Davis Island is now considered one of the most beautiful residential sections of Tampa and Mr. Gannon deserves great credit for the part that he played in its development.

Burt Hamerstrom Promoted in San Francisco

Burt Hamerstrom, in charge of the commercial department of the Market Street Railway, San Francisco, Cal., has also been made head of the transportation department. Accordingly, his title has been changed from vice-president in charge of commercial department to vice-president in charge of service. When the commercial department was established by the Market Street Railway two years ago, Mr. Hamerstrom was chosen to be the one to work directly under Samuel Kahn, executive vice-president.

As a former newspaper man, well versed in the business of customer-ownership and public relations, the choice of Mr. Hamerstrom to establish close relations with the public was considered a fortunate one. Mr. Hamerstrom spent about ten years as a reporter and feature writer in San Francisco, Chicago and Seattle. For more than ten years he was associated with public utilities, including the United Gas Improvement Company, American Light & Power Company and the Illinois Power & Light Corporation.

J. P. Daratt to Go to Havana

Joseph P. Daratt, for more than four years manager of the Frankford, Ind., plant of the Northern Indiana Public Service Company, has accepted a position with the Compania Cubana De Electricidad of Havana, a subsidiary of the Electric Bond & Share company of New York City. The corporation operates the power, electric railway and gas utilities of Havana.

Mr. Daratt will sever his connections with the Frankford branch on Dec. 15 and will begin his new duties Jan. 1. He went to Frankford from Fort Wayne on July 16, 1924, succeeding M. P. Royal, who was transferred to Kokomo.

SAM HALEY, assistant general counsel for the Missouri Public Service Commission, has resigned from that post. He accepted the post Oct. 16, but did not resign as Federal Prohibition Director at St. Louis for Missouri and Arkansas. He will continue to fill the federal post.

WILLIAM F. CROWE was appointed assistant to the president of the Springfield Street Railway and Worcester Consolidated Street Railway of Springfield and Worcester, Mass. This appointment was effective on Nov. 22.

S. A. MORRISON, formerly superintendent of freight service of the Chicago, South Shore & South Bend Railroad, Michigan City, Ind., has been promoted to the position of assistant general superintendent. Mr. Morrison has had many years of supervisory operating experience, particularly with the Chicago & Northwestern line besides his term of service with the South Shore line.

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Thomas Fortune Ryan

Last of the group of financiers which included Messrs. Whitney, Widener, Elkins and others died in New York on Nov. 23

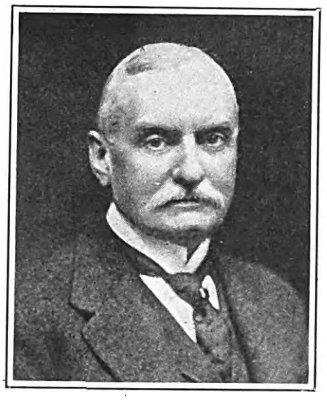
THOMAS FORTUNE RYAN, the last of the group of financiers and railway promoters that included, among others, Messrs. Whitney, Widener, Elkins, Dolan and Yerkes, died in New York on Nov. 23. He was 77 years old. For many years before his death Mr. Ryan had not been active in business, but his interests during his active life had been manifold. He had a hand in the financing of electric railways, steam railroads, public utilities as exemplified in the electric light and power industry, in gas, and in tobacco and other manufacturing concerns. In the field of philanthropy he did his part in his later years. In politics he was both prominent and powerful.

Mr. Ryan is a subject for an analyst with the capacity of a Gamaliel Bradford. In business he was distinguished by wide vision and native shrewdness. He was a product of the age that was portrayed in the "Lion and the Mouse," and of the day that supplied the background for the "Titan" and "The Financier." For that very reason much that Mr. Ryan did must remain an enigma to the present generation, since most of his active career closed before the new conception of big business made headway against habit and conservatism.

Among his achievements were the saving of the Equitable Life Assurance Society in 1905, and his participation in the organization of the American Tobacco Company, acquisition of the Broadway street railway franchise in New York as the keystone for the Metropolitan Street Railway, acquisition of the Third Avenue Railroad in New York, after its former owners had been forced to the wall, and the formation of the Metropolitan Securities Company to hold securities in which Mr. Ryan and his associates were interested.

The stakes in New York were big. Mr. Ryan and his associates saw their surface lines threatened by the new subways with Mr. Belmont at their head. In such circumstances the astute managers of the Metropolitan Street Railway conceived the bold plan of seeking rights for competitive rapid transit lines for themselves. It was Mr. Ryan's move. Only a few years before Mr. Belmont alone had been prepared to leap into the deep waters of rapid transit, but now Mr. Ryan was apparently prepared to follow. Perhaps he was, but as a matter of fact Mr. Ryan's proved only to be a gesture after all. As James Blaine Walker says in "Fifty Years of Rapid Transit," it was not long until the cat was let out of the bag and the financial district rang with the story of how Mr. Ryan had forced Mr. Belmont into a merger by the threat of constructing a new subway to be operated in competition with the underground road into which Mr. Belmont had put his millions. This virtually marked the exit of Mr. Ryan from the transit scene in New York.

It could never be said of Mr. Ryan as it was of Jim Fisk and others that he was one of the playboys of "The Gilded Age." Mr. Ryan stuck sturdily to his last. In all of his many guises he kept the public at a distance—as stock broker, street railway promoter, pilot of the New York traction combinations of the period just before the turn of the century, adventurer at intervals into Western and Southern railroading, reorganizer of gas and electric companies, head of the tobacco trust,



Wide World Photo

Thomas Fortune Ryan

absorber of banks, pioneer in the development of the Congo, buyer of the powerful Equitable Life Assurance Society in the day of its trouble, astute politician, and occasional lavish contributor to charity and art.

When all is said and done, probably Mr. Ryan's most important public benefaction was the purchase of the Equitable Life Assurance Society. After the Armstrong legislative investigation of life insurance companies in New York State and its revelations of extravagance and scandal and the passage of remedial legislation, Mr. Ryan was one of the leaders in a movement to protect the interests of the policyholders. At his request, Grover Cleveland, former president of the United States, Morgan J. O'Brien and George Westinghouse consented to act as trustees and straighten out the affairs of the society. Mr. Ryan regarded this work as a public trust and from his brief control of the society derived no personal profit.

Mr. Ryan was born in Virginia on Oct. 17, 1851, and, as he could get no schooling beyond that afforded by occasional sessions under uncertain hill-country pedagogues, he determined as a small boy to do a lot of studying on his own account. At the age of seventeen he left home to start business life in a city. That was in 1868. He got a clerkship in the Baltimore store of John D. Barry, whose daughter, Ida M., he married in 1873. But Baltimore was too small for him; it has been related that he broke his customary silence to say as much to a fellow store employee. He moved to New York in 1874, became a curb broker, and, within a year, bought a seat on the Stock Exchange. The start on his meteoric career had been made.

"Dan" Smith

"Dan" Smith of Detroit, Mich., soldier, politician, business man, and municipal-ownership advocate, died on Nov. 25. Thus ended a career short in years but extensive in its range of pursuit and intensive in purpose. Known to the electric railway industry at first through his connection with the Peter Smith Heater Company, he was in the public eye in 1921 when as mayoralty candidate opposing Mayor Couzens for re-election he flayed the policies of the municipal street railway chiefs and characterized the plan as "a program which was conceived in ignorance and executed in extravagance." He stood for municipal ownership when operated on economic lines. Nevertheless, for all his disclosures of waste and secretive handling of the Detroit municipal railway project the citizens of Detroit at the polls on Nov. 8 of that year showed their approval of Mayor Couzen's administration and indorsed his re-election.

Dan Smith was born in Detroit, 53 years ago, the son of Peter Smith, the inventor of the well-known heating appliances. In 1907 he became president of the Peter Smith Heater Company and more recently president of the Sattley Coin Counting Machine Company, in both of which enterprises he remained interested until his death. But they were only a part of the man's interests. Mr. Smith had long taken an active part in the various military organizations of the state of Michigan and of the country. First as private he was later to do honor as quartermaster-sergant, captain, adjutant and adjutant-general, seeing active service in Cuba and Mexico and in intention, though not in actuality, in France—for he was on the high seas when the armistice terminating the World War was signed. He never lost contact with soldiers of fortune or rather soldiers of misfortune, for he had made numerous bequests to retired needy soldiers.

In railway association activities Mr. Smith served as chairman of the exhibit committee in 1916 when the American Electric Railway Association had its first exhibit under its own auspices. Nor did he ever actually dissever his connection with transportation. For it is recalled that of late years he has been traveling around in a Lucullian palace on wheels—a bus built for himself which he used for business purposes and as a delectable pastime. It was exhibited at a recent annual convention of the association. He is also recalled by many for his becoming yearly a "newsboy," selling papers on the streets of Detroit for needy families.

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Activity of Equipment Market Continues

Cleveland Railway plans to rehabilitate 750 cars. St. Louis Public Service contemplates new tracks. Several large orders for track and line materials

DESPITE the seasonal decrease in orders of material and supplies, large projects and purchases continue to be made. Estimates on the cost of equipping 750 old-type street cars with Timken axles, individual leather seats, electric heaters, modern lighting and ventilation, and the newest safety devices are being obtained by the Cleveland Railway, Cleveland, Ohio. According to Joseph H. Alexander, president, the popularity of the 100 new street cars put into service on the Cleveland lines recently, as evidenced by the increased riding, was sufficient indication that increased riding on all of the lines can be expected if all of the cars are modernized. When the estimates are obtained for each type of car in use, a study will be made to determine whether the cost will be warranted, taking into consideration the probable life of each car.

Catenary for Cleveland Terminal

The Fort Pitt Bridge Works Company, Pittsburgh, Pa., has been awarded the contract for the fabrication and erection of the structural steel catenary bridges to be used in the electrification of the approaches to the Cleveland Union Terminal, Cleveland, Ohio. The contract specifies that the work is to be completed by June 1, 1929. The catenary bridges are to be built along the right-of-way of the Nickel Plate, New York Central and Belt Line Railroads, between Collinwood and the Union Terminal Station on the east, and along the right-of-way of the Big Four between Linndale, and the terminal station on the west.

Improvement of Poplar Avenue from Third to Dunlap Streets, Memphis, Tenn., has just been started. Permits have been obtained by the Memphis Street Railway allowing it to replace old track and repave the street. The project will cost $90,000.

Plans for a new loop at the end of the Grand Avenue division of the St. Louis Public Service Company, St. Louis, Mo., and Virginia Avenue and Meramec Street, are being considered by that company and the St. Louis Board of Aldermen. Under the new plan the Grand Avenue cars would turn north at Meramec Street and Louisiana Street for about a block, and then over private property of the car company to Virginia Avenue, and south to Meramec Street. The extension of the natural bridge line westward to Pine Lawn has been delayed until the city is ready to proceed with the widening of Natural Bridge Avenue.

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has placed orders for 48,000 ft. of rail, 20,100 paving bricks and 81,600 lb. of asphalt. Other equipment ordered by this company includes 2,896 tie plates and 534 ties.

The Twin City Rapid Transit Company, Minneapolis, Minn., has placed orders for 50,000 paving bricks, three left-hand 200-ft. C. R. mates, 15 ft. long, of 7-in. construction, six left-hand 75-ft. standard mates, 12 ft. long, of 7-in. construction, and six right-hand 75-ft. standard switches 12 ft. long of 7-in. construction. The Gary Railways, Gary, Ind., has just completed its track rehabilitation program on South Broadway, between Little Calumet and 40th Avenue, over the line of the Gary & Southern Traction Company. The pavement between 35th Street and 40th Avenue is of 9-in. crushed stone with tar product penetration.

The Memphis Street Railway, Memphis, Tenn., has just completed its Jackson Avenue extension to University Place. The new section is 1⅛ miles long and costs $70,000. Double tracks have been laid as far as McLean Boulevard, and single tracks from there to University Place terminus.

The Worcester Consolidated Street Railway, Worcester, Mass., has completed the relocation of its tracks on Chandler Street, which was made necessary by the widening of the street. This construction costs approximately $40,000. This company has also renewed five frogs and one switch at the corner of Pleasant and West Streets, at an approximate cost of $1,600. $6,000 was spent for double-track renewals at Billings Square.

Line Materials

Twenty-five miles of No. 00 grooved trolley wire, 5,475 ft. of 1,000,000 circ.mil, paper-insulated, lead-covered 600-volt cable, and one two-section blue Vermont feeder panel top section has been ordered by the Twin City Rapid Transit Company, Minneapolis, Minn. Ten cars of poles, one car of weatherproof wire, and one car of cable have been ordered by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. Cape Breton Electric Company, Sydney, N. S., contemplates the purchase of track and line material for maintenance use.

Fifty General Electric 213 railway motor gear blanks, 12,000 ft. of 1-in. Magnolia lumber, and 12,000 ft. of 1x6-in. white and red oak have been ordered by the Twin City Rapid Transit Company for the remodeling of cars. The Milwaukee Electric Railway & Light Company has purchased five second-hand passenger cars and is remodeling 40 cars into one-man safety cars. The Cape Breton Electric Company has ordered five used Birney single-truck cars and is remodeling three two-man double truck cars to one-man operation. This company has ordered three sets of safety car equipment including air brakes and electrical automatic equipment and 48 cross seats for three cars. Power equipment ordered by this company includes five new 150-hp. boilers and 75,000 firebrick. The Milwaukee Electric Railway & Light Company is building a second floor addition to its Broadway garage.

New Birney Car Tested in East St. Louis

The new Birney car was given its first official test on Nov. 8, over the lines of the East St. Louis Railway, East St. Louis, Ill., in the presence of prominent Mid-West representatives, officials of the local railway systems, electric railway and manufacturers' representatives.

This is the latest invention of C. O. Birney, superintendent of car construction for Stone & Webster, Inc., known throughout the industry as the "Father of the Safety Car," and who for the last fifteen years has offered numerous improvements in street railway practice and design.

The new Birney car was built by the St. Louis Car Company and its trial in East St. Louis offered the visitors the opportunity to study its performances before it is shipped to Houston, Tex., to be placed in regular service. The local demonstration was made from Third and Broadway over the Lansdowne division and back to the local carhouse at Twentieth and State Streets.

Opportunity was afforded all those attending to inspect the trucks and underneath construction of the car from a pit in the East St. Louis shops.

Within the new Birney, which seats 39 passengers, there is an air of luxury. All interior finish is mahogany. Sheet rubber with a mosaic pattern covers the floor, and all seats in the car are of the deep spring design, covered with hand-buffed leather. The car is the one-man type and has full safety equipment. Automobile type visors and bumpers and the low roof give the car a striking resemblance to a large motor coach.

The car accelerated from a standing point to 20 m.p.h. in five seconds and

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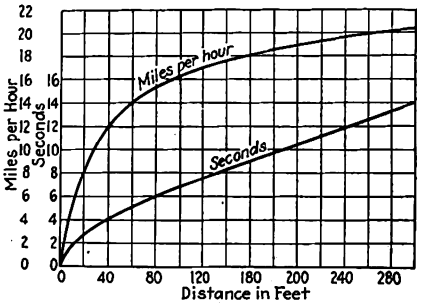

Speed attained and time required by Birney car during acceleration for a given distance

deceleration rated up to 4 miles per second.

The tests show a maximum accelerating rate of 2.4 m.p.h.p.s. for conditions where there is a severe drop in voltage. This is about what might be expected on properties where the voltage conditions are not good. Where the voltage is good throughout the system, accelerating rates of 4 to 5 m.p.h.p.s. may be attained if every condition for acceleration is at its best.

Braking rates up to 4.0 m.p.h.p.s. may be attained with sand on wet rails. Emergency rates of 2.5 m.p.h.p.s. from the "dead man" handle and 3.0 from the brake valve were obtained with bad rail conditions in the rain, aided by sand.

In giving his opinion of the new car to the group on the trial run, G. W. Welsh, vice-president and general manager of the East St. Louis Affiliated Railway System, pointed out that both the driving mechanism and the design represented radical departures from the standard street car as it is now known to the public.

"More than ten years ago," he said, "Mr. Birney invented what is known as the safety car, which is now being used extensively on small city properties all over the country. The new Birney car is designed to find its place in the transportation field between Birney's safety car and the larger double-truck cars now in use in St. Louis and East St. Louis. Its quick acceleration, light weight and attractive appearance will undoubtedly appeal to operators who see in these qualities something with which to compete with present day transportation agencies."

Those who attended the demonstration were entertained at luncheon by the St. Louis Car Company at the Missouri Athletic Club, presided over by Mr. Meissner, president. After the luncheon an interesting discussion followed, during which Mr. Birney mentioned that this car was built in less than 30 working days in order to show it at the A.E.R.A. convention at Cleveland. He took occasion to thank the various manufacturers, particularly, Westinghouse Electric & Manufacturing Company, Westinghouse Air Brake Company, National Pneumatic Company, Johnson Fare Box Company and the St. Louis Car Company for their co-operation.

The following attended the demonstration:

Kansas City Railway, Kansas City, Mo., D. L. Fennell, general superintendent transportation, R. W. Bailey, general superintendent power and labor, R. S. Neal, superintendent of equipment, D. E. Druen, superintendent bus maintenance.

St. Joseph Light & Power Company, C. A. Semrad, vice-president and general manager, F. E. Henderson, superintendent of railway, Theodore Riesemme, master mechanic, Mr. Johnson.

Louisville Railway, Louisville, Ky., Samuel Riddle, vice-president.

Illinois Power & Light Company, Decatur, Ill., M. L. Harry, general manager.

Illinois Power & Light Corporation, Peoria, Ill., R. F. Palmblade, manager, A. T. Leech, master mechanic.

Illinois Power Company, Springfield, Ill., A. D. Mackie, vice-president.

Milwaukee Railway & Light Company, Milwaukee, Wis., John Lucas, superintendent rolling stock.

Kentucky Traction & Terminal Company, Lexington, Ky., D. M. Carr, superintendent equipment, H. Busch, superintendent transportation.

Chicago Rapid Transit Company, Chicago, Ill., D. E. Brittan, engineer.

St. Louis Public Service Railway Company, St. Louis, Mo., Samuel Greenland, general manager, Major Lockwood, assistant general manager, M. O'Brien, master mechanic, A. Finck, transportation engineer, Mr. Jones, Mr. Wright.

Springfield Traction Company, Springfield, Mo., A. E. Reynolds, vice-president and general manager.

East St. Louis Railway, East St. Louis, Ill., G. W. Welsh, vice-president, W. C. Myers, general superintendent, L. W. Jacques, master mechanic, E. H. Slater, assistant engineer, H. P. MacDonald, superintendent automotive equipment, H. Niemoeller, assistant engineer, N. J. Albright, advertising manager, L. G. Leake, general storekeeper, F. O. Whiteman, superintendent service.

Stone & Webster, Inc., C. O. Birney, superintendent car construction.

J. Grause, Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., L. W. Stemrich, Westinghouse Electric & Manufacturing Company, St. Louis, Mo., O. A. Broten, National Pneumatic Company, Chicago, Ill., Otis Turner, General Electric Company, E. Davis, Westinghouse Traction Brake Company, Joseph Dapron, Westinghouse Traction Brake Company, Clarence Brown, Westinghouse Traction Brake Company, J. E. Lytle, *Electric Traction*, Donald Heinly, ELECTRIC RAILWAY JOURNAL, F. H. Ingalls, St. Louis *Times*, Edwin B. Meissner, president St. Louis Car Company, L. F. Seelar, chief engineer St. Louis Car Company, L. W. Richards, St. Louis Car Company, H. R. Cass, St. Louis Car Company, M. J. Oswald, St. Louis Car Company, Frank Grayson, Grayson Supply Company, William Grayson, Grayson Supply Company.

Welded Metal Ties Used on Switches

A recently completed spur connecting the General Electric plant at Schenectady, N. Y., with the Delaware & Hudson Railroad has wooden ties replaced with those of metal.

The feasibility of metal ties was suggested by the General Electric Company, early in 1927, when it announced that it had designed automatic welding machinery which could produce metal ties. The Delaware metal tie fabricating shop at Colonie, N. Y., which produced the ties used in this installation is built around an automatic arc welding machine designed and built by the General Electric Company. Its present output is about 20,000 ties per year. Not only were the switches and cross-overs mounted on metal ties, but the switch stands themselves were mounted on extra long metal ties. By a simple arrangement the base on which a switch stand is fastened is welded to the ties, resulting in a firmly fastened stand, but allowing its easy removal for replacement or repair if necessary.

For this special construction, scrap rails, cut to the proper lengths, were delivered on the spot and there welded by hand and installed under the track. The railroad crew foreman in charge of the installation claimed that not only was the work simplified with the metal tie, but that he could do a much better job with more permanent, beneficial results.

Metal ties of greater length are used where one track leaves another at a switch, being common to both sets of track

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A particularly advantageous consideration, it was found, developed in connection with the installation of the cross-overs. Where one track left another at a switch, metal ties of greater length were used, a single tie being common to both sets of track for quite a distance from the switch.

Secretary of Commerce Makes Annual Report

According to the annual report of the Secretary of Commerce the fiscal year ending June 30 continued the high economic activity which has been characteristic of American industry during recent years. There was a slight recession during the latter part of the calendar year 1927, but this was fully recovered during the first six months of 1928. As a result of this temporary reduction in activity, however, several of the indicators of business conditions show for the fiscal year 1927-28, as a whole, an average a little below the peak levels of 1926-27, although almost every one of them stood materially higher than during such prosperous years as 1923-24 and 1924-25. The slackening of business in the earlier months of the fiscal year just closed was due to special and temporary causes, among others the damage caused by the great Mississippi flood, the prolongation of the effect of the low price of cotton of the crop of 1926, and the temporary shutdown of certain large motor-vehicle plants for readjustment of models. At the close of the fiscal year 1927-28 business in nearly all branches was on a level rarely, if ever, before attained. The volume of production and consumption for the year, as a whole, and the physical quantity of exports and imports were very large, unemployment was relatively unimportant, and the rate of real wages and the standard of living of the masses of the people remained higher than anywhere else in the world.

The general index of manufacturing production, perhaps the most comprehensive measure of business conditions, average 2 per cent lower than the year before and 1 per cent lower than in 1926. It was, however, higher than in any fiscal year before 1926. The relatively slight degree to which industrial activity had been temporarily cut down is indicated by the fact that the index of production of manufactured goods in November, at the lowest point reached, was only 2 per cent below the average for the three years 1923 to 1925. By January, 1928, the index had already been restored to its normal and progressing level, output being 9 per cent greater than in November. Indeed, the first half of the calendar year 1928, taken as a whole, showed greater production in our factories than any corresponding period theretofore.

Mineral production in 1926-27 was abnormally great, partly because of the demand for coal, caused by the British mining strike, and partly by reason of an unduly rapid expansion of petroleum output which was generally considered contrary to the public interest. The falling off in aggregate mineral production during the fiscal year just closed was therefore entirely to be expected; output, nevertheless, remained greater than in any year before 1926-27. The decline in railway traffic last year was in considerable part due to this smaller movement of coal.

The indexes of electric-power production, of building construction, and of the sales of department stores, chain stores, and mail-order houses all showed increases in the last fiscal year as compared with that preceding and most of them were the highest ever recorded.

The foreign trade of the United States in the fiscal year 1927-28 has continued that expansion in the export of manufactured goods which has been a conspicuous feature in the economic life of the United States during the past seven years.

Further progress in the elimination of waste has resulted from continued co-operation among the many branches of industry and commerce. The department has participated, when requested, in this general effort by assembling and distributing economic information, investigating economic and scientific problems, and otherwise assisting the several groups to reach common understanding and solution of their difficulties.

METAL, COAL AND MATERIAL PRICES F.O.B. REFINERY

	Nov. 27, 1928
Metals—New York	
Copper electrolytic, cents per lb.	15.775
Copper wire, cents per lb.	17.875
Lead, cents per lb.	6.35
Zinc, cents per lb.	6.675
Tin, Straits, cents per lb.	52.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.375
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.80
Franklin, Ill., screenings, Chicago, net tons.	1.425
Central, Ill., screenings, Chicago, net tons	1.15
Kansas screenings, Kansas City, net tons	1.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.5
Weatherproof wire base, N. Y., cents per lb.	18.625
Cement, Chicago net prices, without bags	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.8
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.2
Turpentine (bbl. lots), N. Y., per gal.	0.67

Miller Schorn Incorporates

Incorporation of the Miller Schorn Rapid Transit System, Detroit, Mich., developer of the rapid transit plan on which the East Jefferson Avenue express service in Detroit is based, was announced recently. Capitalization was announced at 1,000 shares, no par value, and offices of the concern were given as 338 Lafayette Boulevard.

Officers are: Harry R. Miller and Nicholas J. Schorn, inventors of the plan, and H. M. Gould, former general manager of the Detroit Municipal Railway, who completed the D. S. R. traffic survey a year ago.

Additional Safety Gates for North Shore

A new type of automatic electrically-operated safety gate, which has proved highly successful in practical tests at three locations on the Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., will be installed at 26 grade crossings along the railroad between Niles Center, Ill., and Racine, Wis., according to an announcement by John R. Blackhall, general manager.

TRADE NOTES

ELECTRIC STORAGE BATTERY COMPANY, Philadelphia, Pa., recently announced the appointment of Albert N. Dingee as advertising manager to succeed the late Alfred B. Kreitzburg. Mr. Dingee has been in the sales department of the company for the past eighteen years.

WAGNER ELECTRIC CORPORATION, St. Louis, Mo., announces the removal of its Los Angeles branch office and service station to 1220 South Hope Street. The removal involves all local departments.

BARNEY G. TANG, assistant general superintendent of the Schenectady Works of the General Electric Company, has been made general superintendent to succeed James A. Smith, who died Oct. 25. John D. Harnden, former superintendent of the testing department, has been appointed assistant to the works manager, F. L. Kemp succeeding him as superintendent of the testing department, and Leroy Beers has been made plant engineer, a newly created position under the works manager.

WAGNER ELECTRIC CORPORATION, St. Louis, Mo., announces that H. N. Felton, branch manager of the Milwaukee office since 1927, has been made branch manager of the New York office.

ADVERTISING LITERATURE

I-T-E CIRCUIT BREAKER COMPANY, Philadelphia, Pa., has just published a new bulletin, No. 220, covering a new type of electrical protective equipment, the U-Re-Lite All-Steel Distribution Groups.

HYDRAULIC SOCIETY, New York, N. Y., has published the fifth edition of the Standards of the Hydraulic Society. The principal changes from the preceding edition are a revision of the extracts taken from the A.S.M.E. test code for centrifugal and rotary pumps and changes in materials recommended for the construction of special service pumps, in line with the latest accepted practice.

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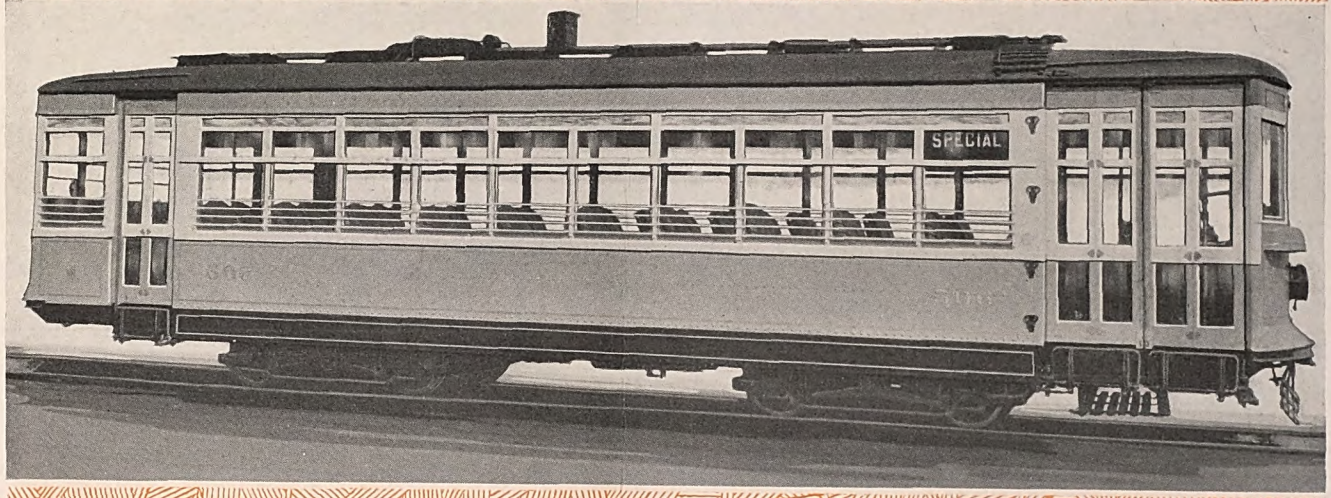

Modernization Pays in El Paso

The El Paso Electric Company serves the cities of El Paso, Texas and Juarez, Mexico. In 1927 this company purchased seven new cars from the American Car Company. This was the initial step in an attempt to popularize their service. These cars are of the double-truck, single-end, one-man type with automatic treadle-operated rear exit doors.

According to the records of the company, the higher acceleration and improved loading and unloading facilities of these cars permitted an increase in speed from 10.3 to 11.9 m.p.h. This has made possible the handling of as many passengers on a line with five cars as formerly were hauled with seven cars. And it is apparent that the public is riding in the cars to a greater extent than formerly.

This is further evidence that improved service with Brill equipment will popularize car riding.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.
Pacific Coast Representative: Rialto Bldg., San Francisco

BRILL MODERN CARS

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ELECTRIC RAILWAY JOURNAL

raw-Hill Publishing Company, Inc. DECEMBER 8, 1928 Twenty Cents Per Copy

Spoksteel

Drivers and fleet owners will never be satisfied until they get *ALL* the superiorities Spoksteel offers.

For high-carbon forged steel wheels are *stronger*. By reason of spoke-type design, they are *cooler* and do not melt up tire mileage. *Cleaner*, too, and quieter. Chassis noises cannot be amplified. *Simple, positive* locking is another great advance.

Make any test you please—be convinced.

MOTOR WHEEL CORPORATION, Lansing, Mich.

Write for descriptive literature

by Motor Wheel

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New Electric Coaches Increase Receipts at Salt Lake City

OPERATION of eleven modern trolley coaches recently placed in service in Utah's capital city has resulted in approximately 25 per cent increase in receipts.

This is due largely to the reliable service and extremely comfortable riding qualities afforded by the luxuriously fitted street-car type electric coach.

These facts bear out the recommendation of Westinghouse engineers that the electric coach has its application in urban service where the density of passenger traffic is not sufficient to warrant street car operation.

Some of the advantages of electric coach operation are:

1. Elimination of track investment and paving charges incident thereto in many communities.
2. The use of cheap electric power and existing substation and distribution equipment.
3. Low operating and low maintenance costs.
4. High schedule speeds, due to concentration of power and unlimited power supply.
5. Quiet operation and adequate maneuvering ability.

Westinghouse motor and control equipment for electric coaches has proved its worth, and Westinghouse representatives are prepared to discuss with you the application of these modern vehicles.

Comparative Operating Costs

Cents per mile

	Electric Coach	Gasoline Bus
Ways and Structures	1.64	.01
Maintenance	7.26	12.63
Power or Fuel	2.32	3.46
Conducting Transportation	10.18	12.47
General	3.55	3.57
Total	24.95	32.14
Passenger Revenue	22.28	14.59

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Sales Offices in All Principal Cities of the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA 1928

Westinghouse

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Electric Railway Journal

Consolidation of
Street Railway Journal and Electric Railway Review

McGRAW-HILL PUBLISHING COMPANY, INC.
JAMES H. McGRAW, *Chairman of the Board*
MALCOLM MUIR, *President*
H. C. PARMELEE, *Editorial Director*

CHARLES GORDON, *Editor*

LOUIS F. STOLL, *Publishing Director*

Volume 72 New York, Saturday, December 8, 1928 *Number 23*

Seeing Chicago's Need, but Doing Nothing About It

NEW records for the number of passengers carried and for gross receipts continue to be made by the Chicago Surface Lines. The total number of rides, including revenue, transfer and free passengers, during October exceeded 142,000,000 and was 2,880,000 greater than in March of this year, the previous high month. The gross income rose to $5,475,000. This was $58,000 larger than in December, 1926, when the old record was established.

In 1907 there were 372,000,000 revenue passengers on the surface cars. That was at the rate of 182 for each of the 2,039,000 residents of Chicago at that time. Last year the population had grown to 3,100,000, but the rate of passenger growth was far more rapid than the rate of growth of the population. There were 882,000,000 revenue rides in 1927, or 284 per inhabitant, in contrast to the 182 per inhabitant twenty years ago. This was an increase of 137 per cent in revenue passengers on surface cars. In the same 20-year period the increase in passengers on local elevated lines was 54 per cent.

According to the Chicago *Tribune* the value to Chicago of an improvement in transit facilities is likewise suggested by the report of the New York Transit Commission. In substantiation that paper quotes the fact that in 1906 the use per inhabitant of all local transportation facilities in the five boroughs of Greater New York was 301, contrasted with the Chicago figure of 182 for 1907. By 1923 the rides per inhabitant in New York had increased to 439, but meanwhile subways had been built. The figure for 1927 for the surface and rapid transit lines in New York was 461. As the *Tribune* sees it, these figures point to the probable advantage to be derived from the modernizing of Chicago's transportation facilities and leave many persons wondering why investment bankers are not falling over each other for the opportunity to underwrite the reorganization.

For the benefit of the *Tribune* and the people of Chicago, it should be said that the bankers are not falling over one another to do this because of the policy of bickering and procrastination followed by the city during the past decade. It may be well to recall here that Chicago has, on two different occasions, turned down by popular vote comprehensive plans proposed for the coordination and extension of its transportation facilities—once in 1918 and again in 1925. It is interesting to note also, that those who were so vociferous in opposing previous proposals as being "steals by the bankers and grasping corporations" have been content to lapse into silence while the situation continued to drift and the former franchises to expire. In the meantime these corporations, with inadequate credit and no assurance of future operating rights, have continued to meet with available facilities the public need for transportation service in a way that has established an outstanding record of operating efficiency.

Were it not for the previous failure of Chicago to meet its transportation problem intelligently the situation would not exist as it is in that city today with the Surface Lines operating by grace of grants extended temporarily and with one of the systems in receivership if not in default. A settlement is needed in Chicago, but it can be made only "by close co-operation among the city authorities, the citizens, the railways and the various agencies which create public opinion." The *Tribune* is only partially correct. The opportunity is there. The companies have made the most of it under the limitations imposed upon them. It is a shame that the possibilities in the Western metropolis are not being fully realized, but that shame is Chicago's. So far as transportation is concerned, the slogan of the city appears to have been changed from "I will" to "I won't."

Approaching the Fare Question on a New Basis

KANSAS CITY has a problem. That has been evident for many months from the earning statements of the recently reorganized Kansas City Public Service Company. Serious decreases in revenue have produced a deficiency in earnings which has for some time been causing grave concern to the railway management. Not only has the company failed by a wide margin to earn the amount allowed in the ordinance, as a return upon the outstanding securities and the $6,600,000 of new money put into the improvement of the property since the reorganization, but it finds itself unable to finance additional improvements demanded by the public, and even threatened with inability to meet its fixed obligations and operating costs.

This is not alone a problem of the railway company. It concerns the city itself, for upon the ability of its public transportation system to maintain a high standard of operating efficiency and to keep up with the growing needs of the community, depends in large measure Kansas City's future development. With that conception of the city's interest in the affairs of its transportation company, the management of the latter has approached the present problem in a laudable way. The railway is convinced that a higher fare is necessary and that nothing less than 10 cents will suffice. But it has made no formal application for an increase. Instead, it has prepared a comprehensive report, clearly presenting the facts of the present situation and outlining the causes of the difficulty and the various alternatives that are open for meeting the situation. This it has submitted to the franchise committee of the Kansas City Council on the assumption that the city has a vital interest in the problem that has arisen, and that any formal move to relieve the difficulty should first be discussed frankly between the company and the representatives of the city which it serves.

In its report, the company openly urges the need for a

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10-cent fare. But it discusses in turn, the several other steps that might be proposed and carefully points out the reasons why it considers the higher fare necessary. Throughout the report it is assumed that the city has a vital interest in maintaining its transportation system in a high state of operating efficiency. "No half-starved horse ever pulled a heavy load. A half-starved transportation system never helped the growth, prosperity or credit of a city," says this illuminating document on its first page.

In view of this unusual procedure in approaching the question of street railway fares, it will be interesting to observe the action which will be taken by the City Council. Final supervision of fares is lodged in the Public Service Commission of Missouri, and an examination of the report just made substantiates the fact that the company has ample evidence to support a formal application for a higher fare before the commission. But it prefers to put its problems before the representatives of the city in an effort to avoid the usual proceeding in a rate case. It takes the position that the city should be as much interested as is the company itself in meeting a situation which threatens the efficiency of its transportation service. Will the city recognize the spirit in which this report is thus presented? Will the city officials be willing to face the issue squarely and recognize that preservation of a progressive transportation service is more in the public interest than is the maintenance of the minimum possible rate of fare? That remains to be seen.

Popularity Enlists Consideration

STREET car patrons are less able than any other class of citizens to pay more than the legitimate cost of their urban transportation. If the street railway industry is to survive and to develop along economically sound lines, it must convince the butcher, the baker, the merchant and the manufacturer, along with city officials and the general public, that a reallocation of taxes and, even more important than that, a changed point of view regarding the taxation of transportation service, are imperative. The merchant, the manufacturer and the property owner are real beneficiaries of urban transportation, although they contribute little patronage directly to the street car or bus. Aside from public officials themselves, city transportation managements represent the only group in the modern community which is in position to speak with knowledge and authority in the interest of the street car or bus rider.

This in effect was the declaration of T. P. Walker, vice-president of the Virginia Electric & Power Company, in an address delivered recently at the annual convention of the Public Utilities Association of Virginia. Mr. Walker emphasized the need for removing unjustified paving and other special taxes imposed upon transportation properties above the usual ad valorem and income taxes assessed against other forms of business. The justice of this plea needs little argument, since it is obvious that these taxes are borne by the car rider for the benefit of property owners, business and auto drivers. The service rendered by a public transportation system is of such value to property, business and the community at large, that the present-day practice of taxing transportation facilities in favor of property and business, might justifiably be reversed, when necessary, to insure maintenance of these facilities which contribute so much in the form of community values.

But to bring about a reversal in the public attitude toward transportation the public must first be made to understand what it might expect in the way of improved transportation service if this important utility were put upon a proper economic basis in relation to the community. This cannot be accomplished by expecting the "pretty good" rolling stock of yesterday to hold its own with the present highly developed private automobile. To win real public co-operation, the possibilities of improved transportation must be demonstrated in any given community, sometimes to the extent of investing good money to show what could be done if proper support were available. The public favors the private automobile today, even in the matter of traffic regulation and parking privileges, despite its relative unimportance in terms of passengers carried. Only by making public transportation popular as well as necessary can its sponsors win that degree of public consideration which its economic importance in the community justifies.

A Railway Offers to Sponsor and Direct Traffic Planning

DOUBTLESS the Philadelphia Rapid Transit Company would have preferred that some agency other that Mitten Management should conduct a traffic survey of Philadelphia, but when it became apparent that there was little likelihood anything would be done about the matter in the immediate future, the company did not hesitate to indorse the Mitten Management plan for carrying out the work, as outlined in last week's issue of ELECTRIC RAILWAY JOURNAL. All the Philadelphia papers are agreed that a traffic survey is needed in that city. The traffic committee of the Chamber of Commerce has repeatedly urged a comprehensive survey of traffic conditions by an independent expert employed by the city. It was on the score of the inactivity on the part of the city that the Chamber of Commerce acted in approving the Mitten proposal.

After all, the proposal is eminently sound. Who has a broader interest in traffic improvement than the street railway management which is alert to its obligations? The point made in advocating the plan was a strong one —namely, that the management organization had fifteen years of actual experience in furnishing transportation over the city streets and that no group of engineers could come into Philadelphia and secure the facts or acquire the knowledge possessed by the transit management, without long and intensive study.

For years the Philadelphia management has insisted that the rights of the 80 per cent who use the streets for transportation via public vehicles should be respected. It proposes now to get at all the facts regarding street use and traffic movement. The survey is intended to develop a plan for city-wide traffic control, including the operation of all public vehicles; a parking plan; a scientific signal light system; the construction of new streets or the widening of others if found necessary and practical; the elimination of grade crossings; the study of accidents, and every other factor that in any way involves the right of the citizens to obtain the safest and most convenient use of the streets. Surely this is comprehensive. The *Philadelphia Record* has voiced the sentiment of those who have recognized the proposal as sound by stating editorially that no makeshift measures are going to relieve business of the ultimate consequences of traffic overgrowth.

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The transit company admits that since it operates the street cars, the buses and the taxicabs, it has a selfish interest to serve, but it points out that its selfish interest is the interest of every man, woman and child who uses its service and that means the great majority of Philadelphia's citizens and taxpayers. It points out, further, that merchants and manufacturers must recognize that the smoother flow of traffic is to their interest, too, even as it is likewise to the interest of the motorists who use the streets.

This is a frank statement of the situation and of the motives of the railway management. Favorable reaction to the Mitten proposal indicates that its very frankness has inspired public confidence. It is promised that only after every interest affected has had an opportunity to be heard will a plan be submitted to the Mayor's traffic committee, and not even then, until after the executive committee of the Chamber of Commerce has approved the recommendations. As the *Record* again so aptly says, whatever the cost of bringing relief to congested Philadelphia streets, it will be less than the cost of letting things drift or of merely tinkering. Either of these courses must ultimately result in enormous losses. It is too bad that this point of view is not more generally accepted. So great is the preponderance of evidence indicating the opportunity for developing an intelligent traffic policy that it is difficult to understand the disposition in many cities to permit business to be choked by traffic that has degenerated into congestion.

Boston, Revere Beach & Lynn Electrification Merits Attention

PLANNED 56 years ago to develop East Boston and Revere, the Boston, Revere Beach & Lynn Railroad, by the recent electrification of its lines, has taken a long step forward in improving its service to these and other communities. Quicker, more frequent and more reliable transportation is the objective of the present management. Even during the actual installation of electrical equipment schedules were maintained. The demonstrated efficiency of the new electric service is winning friends for this railroad.

Because of the cost of steam operation and minimum crew requirements, large capacity trains formerly were necessary. To load these larger units only infrequent headways could be operated. Therefore, the character of the service suffered. Careful study indicated that electrification of the road would improve transportation facilities and at the same time would lower the cost of operation. With electric power small unit trains are run on shorter headways, giving faster service at decreased cost.

In carrying out the work of electrification an effort was made to keep the total expenditure to a minimum consistent with reliable service and ultimate operating economy. The existing road and equipment was adapted as far as possible to the new motive power. Less than two-thirds of the old cars have been motor equipped, the existing track was altered for electric operation, a feeder-messenger-type of catenary overhead was used, and contracts to purchase central station power were made.

The desire for economy in first cost, however, was balanced by a policy of far-sightedness in selecting equipment and materials. Only highest quality apparatus was considered compatible with maximum efficiency. Electro-pneumatic brakes replaced the antiquated vacuum brakes used in the steam operation. This change is considered by the management as a major factor in making possible increased schedule speeds. In the line and catenary installation non-corrosive materials and fittings were used to insure long life and low maintenance. Considering the cost, time and quality of the installation and the unusual conditions encountered and mastered, the electrification of the Boston, Revere Beach & Lynn Railroad stands out as an example of far-sighted and conservative management.

Agitation for Unification Revived in New York

MOST anything may come out of the medley called transit in New York City. Both the Interborough Rapid Transit Company and the Brooklyn-Manhattan Transit Company, operating the rapid transit lines, are doing the best they can under adverse circumstances, with the various surface lines trailing along. The Equitable Coach matter still is unsettled, that enterprise being in the position of having secured from the city certain rights to operate buses, but not having secured the sanction of the state regulatory authority. The Equitable matter is involved in all sorts of rumors, even to one that its control has passed to interests identified with the present operating companies.

Meanwhile comes the statement that negotiations are to be resumed looking toward unification of the present lines, and the further announcement that the subway lines now being built by the city itself will probably be ready to be placed in service early in 1930. This may be a full municipal enterprise both as to its ownership and its operation in the event that the unification negotiations fail, but even then there would remain the possibility of private operation under a management contract. In any case, the city's system if run as a municipal enterprise must be operated at a 5-cent fare for the first three years, after which a rate must be charged sufficient to make the enterprise self-sustaining.

But the way is not all dark and cloudy. Those entrusted with the prosecution of the municipal enterprise have indicated that there is no intention on the part of the city to build its own power house, and matters have been helped by the disposition of the engineers of the city subway and others to fashion the rolling stock intended for use on the new lines in a manner that will make it possible to interchange service with at least one of the present operating systems, without carrying out major changes in physical structure. There are to be seven connections with existing lines for the interchange of passengers. This also is a good omen since it will help in the event that a plan for unification is devised.

It would, of course, be saying too much to indicate that New York is well taken care of so far as the number of available transit lines is concerned, but it is not saying too much to register the opinion that New York could be much better served than it now is if the existing lines were unified. No amount of ingenuity in the operation of the individual systems can offset the needless waste imposed under a system that does not permit the various systems to articulate their services. The lines now under construction by the city are a legacy from the Hylan administration. It is not too late to overcome some of the defects of their conception, but the value of the new system can best be realized only under an arrangement for co-ordination of operation with the existing roads.

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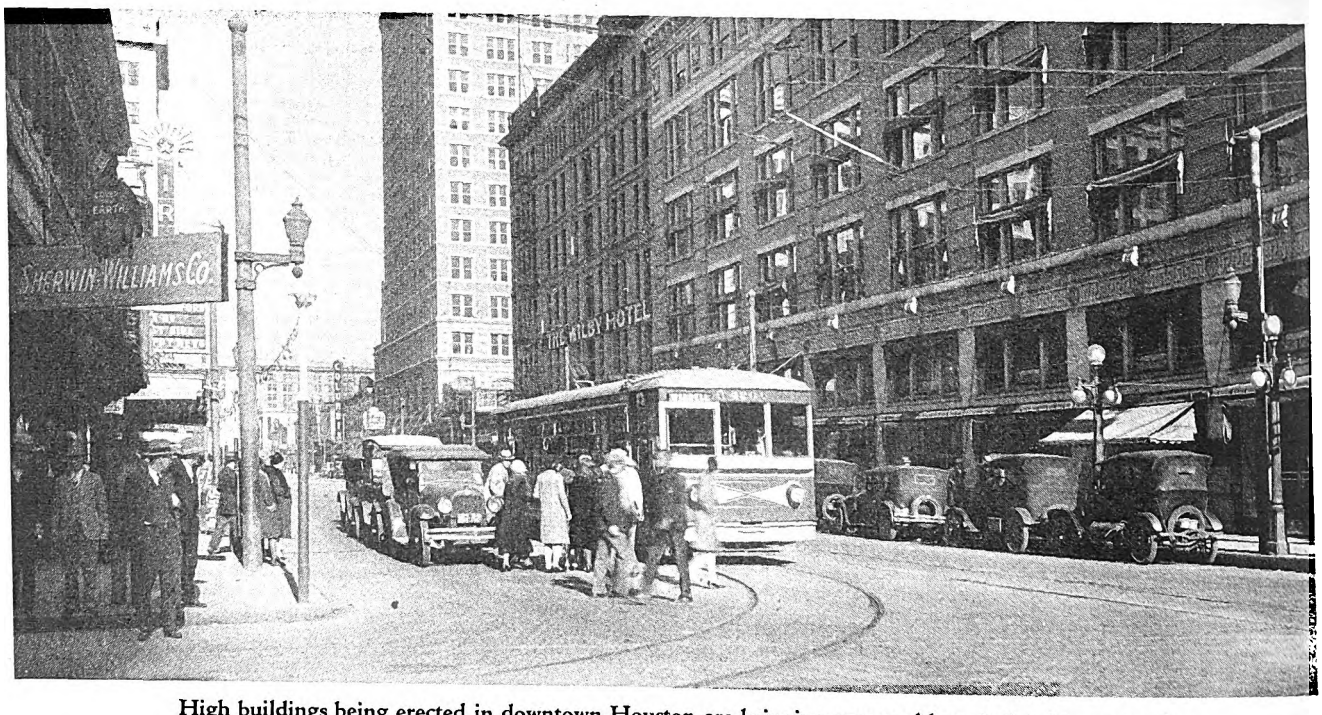
Express Buses

to Supplement Rail Service in Houston

Beeler Organization suggests several methods of providing high-speed service to growing district. Advantages over earlier plans. Functions of buses and electric railway in city transportation are outlined



High buildings being erected in downtown Houston are bringing new problems in local transportation

TRANSPORTATION problems in Houston, Tex., have recently been the subject of study by the Beeler Organization. This was done at the request of the city, following agitation for the removal of car tracks from certain streets. Rather than the suggested abandonment of car service the Beeler report proposes changes in routing and the establishment of express bus service.

The business district of Houston lies nearly in the geographical center of the city, but the recent rapid growth of the city to the southwest demanded faster service than was supplied by existing means. Main Street, a wide and long boulevard, which passes through the principal shopping district reaches this growing section of the city. Except for two reasons it would form an ideal thoroughfare for a transportation line between the two sections. One is that diagonal parking is permitted, and this has so narrowed its available width for traffic in the downtown section as to leave insufficient room for a line of buses or cars each way, together with such other traffic as naturally would have to be accommodated. Another objection to its use for railway cars is that some time ago a car line was removed from Main Street, and some of the citizens in Houston have acquired the impression that the popularity of the street for retail trade is due in part to the absence of tracks.

The means of transportation in this district at present are shown in an accompanying map, the downtown district being at the right. Main Street is not shown, but lies between Travis Street and Fannin Street. The cars on the Heights-South End car route from the north end of the city which serve this district, come down Washington Avenue, pass through the business district, and then go southwest on Fannin Street as far as Eagle Avenue. Here the line turns northwest for two blocks, and returns via Travis Street, except for a short detour on Louisiana Avenue.

This car line is the most important in Houston. The cars operate on a headway averaging six to seven minutes throughout the middle of the day, four minutes in the morning rush, and five minutes during the evening rush, as far as Eagle Avenue. In addition, eighteen more trips are made during the evening rush hour as far as McGowen Avenue, thereby affording a 2½-minute headway for the section north of McGowen Avenue. During 1927, this line carried 6,953,444 revenue passengers, which is more by 60 per cent than all of the bus lines in the city combined. Persons desiring to travel out Fannin

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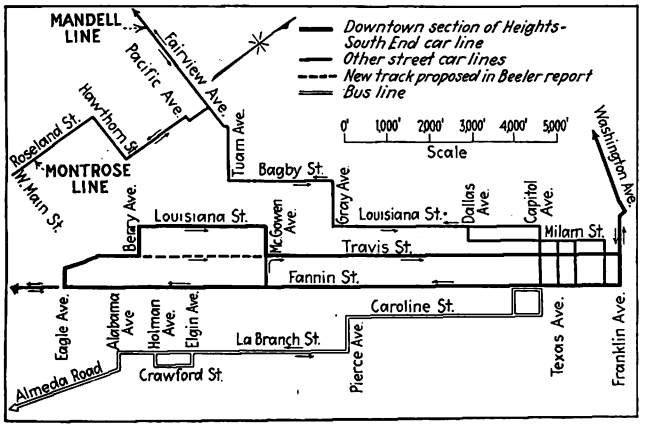


Present transportation routing in down-town Houston

Street beyond Eagle Avenue transfer to a shuttle car at Eagle Avenue.

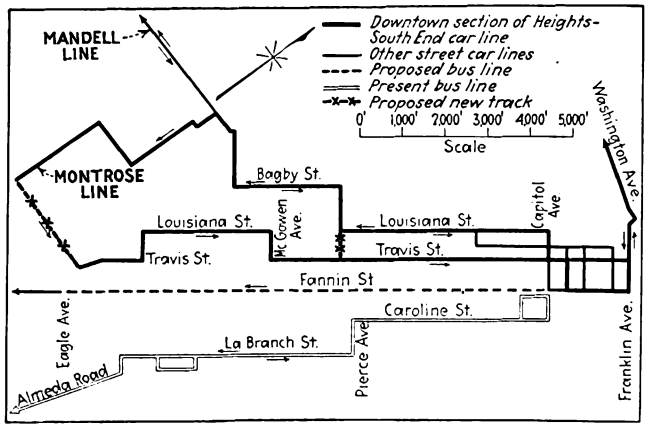
A short time ago the Fannin Street Improvement Committee petitioned the city to order the substitution of buses for electric cars on that street, alleging street railways are now considered obsolete and noisy, that they block traffic, retard the movement of vehicular traffic and are hazardous to pedestrians crossing the street. The abandonment of track on Main Street and its preeminence as a business thoroughfare were offered as further arguments for the abandonment of trolley service on Fannin Street.

At the request of the city, the Public Service Commissioner, together with his engineer, suggested some plans for carrying out this request. Plans were also submitted by an engineer for the Fannin Street Improvement Committee. One is illustrated in the second map. By it the Heights-South End cars were to be routed out Louisiana Street around the loop shown and then back to Travis Street, while Fannin Street was to be given up to a bus line. The other plans were slight modifications of this general idea. All involved the abandonment of track on Fannin Street and called for some new track construction to provide the necessary rail connections.

With eight buses, the plan illustrated would require an investment of $126,700 and an increase in total operating costs of $80,488. A second plan also with eight buses called for an investment of $196,975 and increased operating expenses of $81,469. Other plans were prepared calling for 7, 11 and 17 buses. They differed only slightly from that shown.

ESTIMATE OF COST OF BEELER PLAN NO. 1

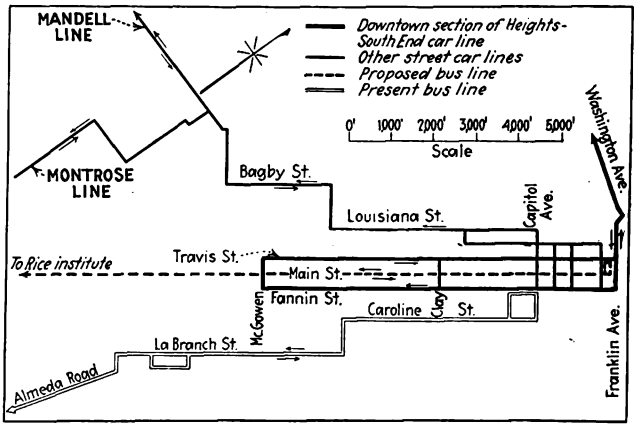
Investment:		
Ten buses at $12,000	$120,000	
Auxiliary equipment at $2,500 per bus	25,000	
Track on Clay Avenue	11,250	
	$156,250	
Cost of bus operation:		
406,063 bus-miles at 16.66 cents		$67,650
40,150 bus-hours at 54 cents		21,681
20 per cent renewal and retirements on $120,000		24,000
5 per cent renewal and retirements on $25,000		1,250
Vehicle tax 10 × $321		3,210
Property tax 2.27 per cent on $145,000		3,292
8 per cent interest on $145,000		11,600
Total bus costs		$132,683
Reduction in Car Operating Expense:		
274,042 car-miles at 14.93 cents		$40,914
30,792 car-hours at 54 cents		16,628
Tax reduction 2.27 per cent on $97,600		2,216
Total		$59,758
Less 14.77 per cent on $11,250 for new track on Clay Avenue (8 per cent interest, 4½ per cent renewal and retirement, 2.27 per cent taxes)		1,662
Saving in rail costs		$58,096
Net increased costs		$74,587
Increased revenue from 2,685,537 passengers using express bus service		64,453
Loss in net earnings		$10,134



One suggested plan was to take up the track in Fannin Street and reroute the cars as shown

The Beeler Plan

After being called into consultation by the city, the Beeler Organization suggested three plans. That preferred is shown in the third map. By it the Heights-South End car line would continue to operate on Fannin Street as far as McGowen Avenue, then loop back on Travis Street, and an express bus line would be put on Main Street, to operate non-stop from the business district to McGowen Avenue. Then the buses would run, with stops arranged to permit fast service, to Eagle Avenue and beyond. This plan calls for the removal of the tracks beyond McGowen Avenue, as well as those used by the shuttle car beyond Eagle Avenue, but the shuttle track was to have been abandoned in any event because the cost of new track and paving beyond Eagle Avenue would have been prohibitive. A track connection at Clay Avenue was to be installed for turning short line and emergency cars. The cost of this change is estimated as shown in the accompanying table. The report points out that in this case diagonal parking would have to be given up on Main Street, in favor of parking parallel with the curb, and sufficient curb space would have to be left for bus stops.



The first choice of the Beeler Organization is to retain most of the track and install an express bus service on Main Street

The car lines in Houston now operate over 88 miles of track and 59 miles of streets. There are also six local bus lines, three of which reach the business district and three which operate as feeders to car lines. In addition,

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TRAFFIC DATA IN HOUSTON, TEX.

Total in 1927		Percent Increase Since 1924 1924	1925	1926	1927
259,000	population	100.0	109.8	120.4	132.2
$3,003,365	passenger revenue	100.0	104.4	111.4	122.6
41,264,223	revenue passengers	100.0	104.9	111.0	108.6
35.7	car- and bus-miles per inhabitant	100.0	95.7	91.2	90.0
7.28	average fare in cents	100.0	99.8	100.2	112.9
$11.59	passenger revenue per inhabitant	100.0	95.1	92.3	92.5
51,824	automobile registration	100.0	115.2	130.3	142.8
200	automobiles per 1,000 inhabitants	100.0	105.2	108.2	108.2

there are ten express bus routes. Altogether, the bus routes cover 46 miles of street. The inauguration of express, or non-stop, bus service to serve districts beyond the zone of car or local bus service has met with success and apparently enjoys the unqualified approval of the patrons. The fast express service has been largely a development since 1925. It may have been a factor in checking the rapid growth of the automobile, as automobile registration per 1,000 inhabitants shows no increase in 1927 over 1926.

The tendency in Houston is to serve the district near the center of the city by car and those farther from the center by bus. Of the nineteen car lines radiating from the center of the city, eleven terminate near the 2-mile limit. Only eight go beyond, and of these only one operates any appreciable distance beyond the 4-mile circle. One of the three local bus lines terminates within the 2-mile circle, and the other two extend out about 2½ miles. Of the eight city express bus lines, only one terminates at a distance less than 3 miles out and three operate beyond the 4-mile circle.

The present rates of fare, effective June 12, 1927, are as follows:

On street cars and local bus lines, 10 cents cash with four tokens for 30 cents; the purchase of a 25-cent weekly pass enables the holder to ride on any local line for 5 cents each time; children and students may ride for 4 cents cash.

On express bus lines the fares are: 10 cents straight; children and students for 5 cents; free transfers connecting from express bus lines to all other lines. Passengers may receive transfers from local to express bus lines on payment of a 10-cent cash fare, or the payment of 2 cents in addition to any token, or a nickel cash fare. The charge for a transfer to children is 1 cent.

In 1928 the express buses will carry, in round figures, four million riders. These buses now average 2.7 passengers per bus-mile. As the total cost of this service, including interest on the investment, is 30 cents per bus-mile, it will be seen that the cost per passenger is 11 cents. In other words, the service is being conducted at present at a loss of 10 per cent. However, the territory served is newly developed and this handicap of a 1 cent loss per revenue passenger should speedily be overcome. An advantage of the express bus service is that it satisfactorily solves the rapid transit problem for years to come in an efficient and economical manner.

Bus Progress in China

BUS operation is making progress in China, though somewhat slowly, according to a foreign contemporary. The principal reason is the lack of good roads. Nevertheless, where fairly good roads exist, the automobile and bus are found in growing numbers. At the end of 1926, there were 26 omnibus companies in China, mostly in the northern part.

The first bus company in Shanghai was established in 1924 with a capital of about $500,000 and with buses purchased in England. Operation was begun on the basis of a fairly high fare and a seat for every passenger. But little business was done, however, until the fare was put down to about 1¼ cents per mile, and a standing load was carried. Then the company began to make money. The buses now owned number 52, and the routes operated vary from 2 to 7½ miles in length. The company employees about 450 men.

Shreveport Railway Pushes Ahead

By purchasing new equipment the company has overcome jitney competition and has increased its earnings and income

SHREVEPORT, La., has 80,000 inhabitants and the Shreveport Railways furnishes transportation there with 35 miles of track and 52 passenger cars. The company has overcome both jitney competition and the handicap of an inadequate fare, and during 1927 both its earnings and income were higher than in any twelve months period during the past five years. It tells its story modestly but clearly in its Coffin award brief prepared for the 1928 contest.

When the company first sought a higher fare in 1920 the increase was granted promptly by popular vote. Unfortunately for the company, a change in the state constitution made soon after required ratification of any fare change by a state commission and this was not granted. Finally, by appeal to the United States courts, an increase in fare from 5 to 7 cents was obtained, and was accepted without complaint by the citizens of Shreveport. Jitney competition was met by a steady policy of fair dealing and full publicity of the problems of the company through the newspapers and other available media.

During the past year the Shreveport Railways installed three 500-kw. automatic substations, which, with one already built, have permitted it to abandon its power station in favor of purchased power. The estimated saving in money is $500 per month. During the past year also it has built a new paint shop 200x30 ft. and installed a system of spray painting. By its means, one painter and helper do as much as was formerly accomplished by two painters and two helpers. The company has also purchased during the year two 52-passenger cars, equipped with treadle doors and suitable for one-man or two-man operation.

Its safety campaign is based on the plan adopted in 1924, by which any motorman or conductor who is in continuous service and for a period of a year has no accident, receives a gold star. Two such stars entitle the motorman, and three stars a conductor, to a new uniform. A new uniform is also given for each succeeding year of similar service. Under this arrangement during 1927, out of a total of 133 motormen and conductors, 100 earned a star, and 34 motormen and 31 conductors earned a uniform.

The amount of money paid by the company during 1927 for damages, including in this payment cost of the new uniforms given to the motormen and conductors, for yearly no-accident records, was $5,999. This is less than 1 per cent of the gross revenue.

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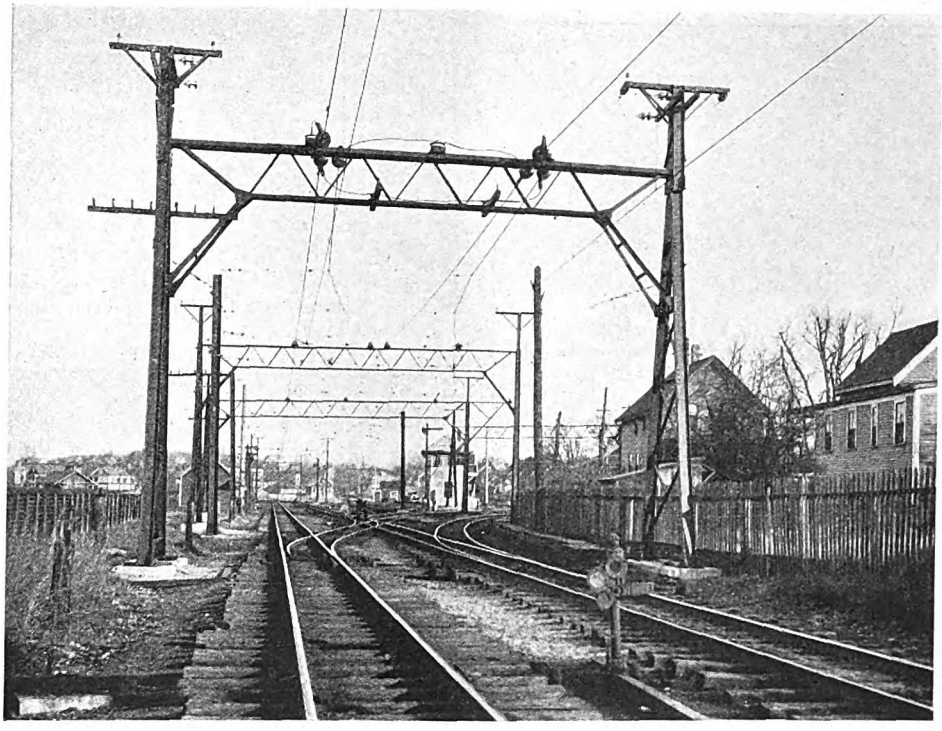

Catenary type overhead with feeder-messenger is suspended from steel bridges

"Narrow Gage" Electrified

for Economy

Quicker, quieter and cleaner service now being given by Boston, Revere Beach & Lynn Railroad. Three-foot gage retained. Special motor constructed. Messenger feeder used in catenary type overhead

ECONOMY was the paramount consideration in the electrification of the Boston, Revere Beach & Lynn Railroad, Boston, Mass. At the same time the service has been made quicker, quieter and cleaner. As the electric trains move smoothly over the line, murmurs of satisfaction are heard from the passengers on every hand. To make possible this improvement in service, an expenditure of $1,400,000 was required which was divided in the following manner:

Car equipment	$610,000
Substations	152,000
Overhead structures, lines and feeders	277,000
Signal changes	90,000
Miscellaneous construction including engineering, interest charges, etc.	271,000

During rush hours, six-car units and express trains have been inaugurated. Throughout the day trains operate at an increased schedule speed and greatly decreased headway. The running time between Boston and Lynn has been reduced about one-third and the comfort and safety of passengers has been materially improved. At the same time, the number of cars in operation has been reduced from 96 to 67 and the 26 steam locomotives have been discarded. The essential principles of steam and electric operation are fundamentally opposite. In steam operation, on account of the cost of locomotives and minimum crews, the whole tendency is toward heavier trains and greater headway. In passenger transportation, shorter headways mean more passengers. With electric operation the trains can be broken up into smaller units running on shorter headways, thus giving faster service with less expense.

The Boston, Revere Beach & Lynn Railroad was planned 56 years ago, primarily to develop the land which now comprises the municipalities of East Boston and Revere. Service was inaugurated in 1875. What is now the Winthrop branch was originally the Boston, Winthrop & Shore Railroad, started in 1877, and merged with the Revere Beach Road in 1891. In November, 1927, the railroad was purchased by the Eastern Railway

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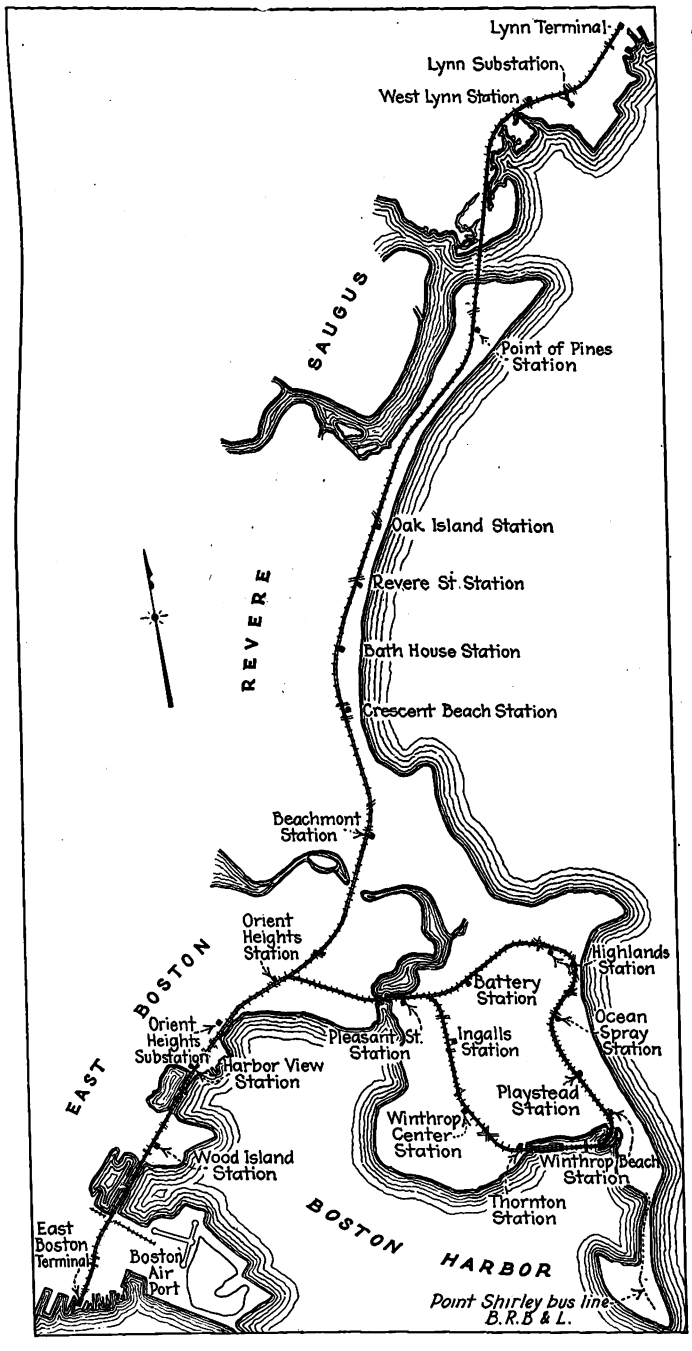

The Boston, Revere Beach & Lynn Railroad electrified its entire system from the East Boston terminal, which is connected to Boston by ferries, to Lynn including the double-track loop to Winthrop. Substations are located at Orient Heights and Lynn

Associates, controlled by Hemphill & Wells, and American Equities Company.

Immediately upon acquisition of the property by the new owners, steps were taken toward electrification. There was an outstanding capital stock of $850,000 and 4¾ per cent first mortgage bonds amounting to $1,000,000. To finance the electrical program, the Massachusetts Department of Public Utilities authorized an issue of additional capital stock in the amount of 1,700 shares with a par value of $170,000 and $1,000,000 in 6 per cent, general mortgage bonds. Additional short-term notes were necessary to complete the financing.

As shown in the accompanying map the railway operates between Boston and Lynn with a branch line forming a loop through Winthrop. To connect Boston with the terminal in East Boston, three ferries are operated across

Car Equipment

Trucks	Brill 177-E2
Motors	General Electric 295-A, 600-volt
Trolley	Nuttal. Trolley wheel No. 48. Harp—Form 30
Trolley base	U. S. 14
Main switch	MS-118-A
Fuse box	MA-13-F
Contactor box	SB-72-A3
Master controllers	C-503-A
Reverser	DB-431-A1B
Field control switch	ME-67-C1
Grid resistors	Type BG-Form G
Heaters	Consolidated Truss Plank
Lighting fixtures	Electric Service Supplies Company, 1022 Dome Type

Electro-Pneumatic Brake Equipment on Motor Cars

Master governor	ML Form E3
Contactor (compressor switch)	DB 937
Feed valve	M3
Motorman valves	A-Form D14, modified to omit release pipe and to include the contactor pipe connection
Equalizing reservoirs	Two 10x14½ in.
Contactors	duplex pneumatic
Brake cylinder	Type S 12x12 in.
Triple valve	M2A
Supplementary reservoir	16x42 in.
Conductor's valve	B3A
Slack adjuster	Form J

the harbor. The entire system is double track. Last year 13,350,000 passengers were carried. A total of 60 electric cars, seven trailer cars, and two electric service cars are operated over 13.12 miles of line having 34.48 miles of electrified track. The running time between Boston and Lynn has been reduced about ten or fifteen minutes, which is a saving of one-third of the time formerly required by the steam trains.

No new cars have been purchased. Sixty of the 96 passenger cars used in steam service have been remodeled and electrically equipped. Seven additional cars have been remodeled as trailers. The interior of each car has been refinished and small operating cabs built in each end. Each car has been equipped with 30 Consolidated 500-watt truss plank heaters connected fifteen in series on a circuit. The heating circuits are controlled by a Consolidated No. 213 switch mounted at the motor end of the car. Wiring has been installed for a thermostat to be placed in the center of the car. The lighting fixtures furnished by the Electric Service Supplies Company are the 1022 dome type, with short-circuiting sockets. Twenty of these dome fixtures with 32-volt lamps are connected in series in each car. A General Electric J-63 headlight can be attached to the front of each car by means of brackets arranged on the handrail. These headlights are equipped with 250-watt incandescent lamps controlled by a three-way switch located in the cab through a tapped resistance permitting dimming.

Motive power has been provided by replacing one of the old trucks with a new Brill 177-E2 truck equipped with two General Electric 295-A 600-volt railway motors. Because of the narrow gage these motors were especially designed for this installation. They are the four-pole, direct current, commutating pole railway motors for operation with tapped field on 600 volts. The weight of the motor complete with gear, pinion, gear cover, and axle bearing linings, is approximately 2,770 lb.

The frame of the motor is the box type with bar suspension. Longitudinal ventilating ducts are provided in the armature, which is keyed to the spider. The shaft can be replaced without disturbing windings or the commutator. The commutator is unusually narrow for a railway motor and its diameter is 14½ in. The depth of

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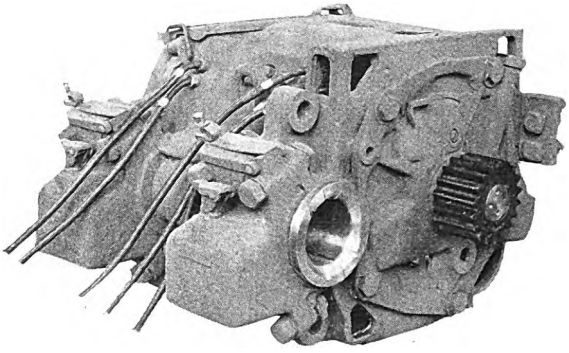
the segments is approximately $\frac{3}{4}$ in., the segments being mica-insulated and grooved $\frac{3}{64}$ in. There are four brush-holders per motor, which are adjustable radially. Steel clock spring pressure fingers are centrally located by recessed adjusting sleeves which are clamped by the first turn of the spring. The carbon ways are renewable and each brush-holder is equipped with a $1\frac{3}{4}$-in.x$\frac{5}{8}$-in. brush. Because of lack of space, the commutator overrides the bearing on that end of the motor. Ventilation is produced by a multiple fan integral with the pinion end

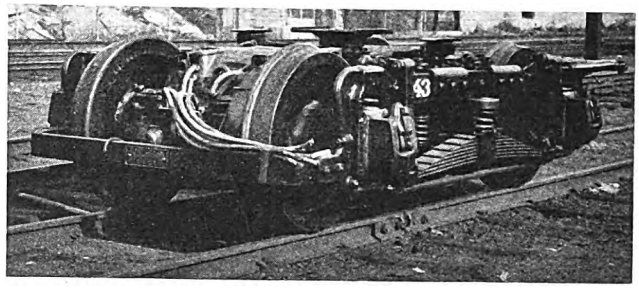


Because of the 36-in. gage the motors were specially designed by the General Electric Company

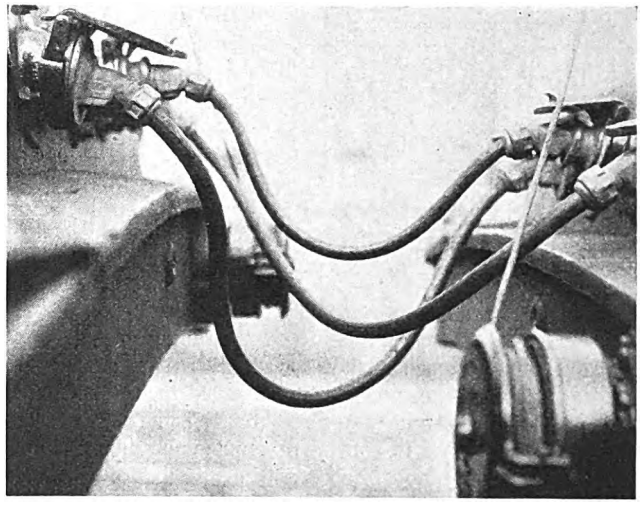
of the armature head. The air intake is through protected openings in the top of the commutator cover.

The cars are equipped with type M control for multiple-unit operation. Current is collected from the trolley by a Nuttal 11 ft. 4 in. pole. Current is carried down the car at the left-hand corner post on the motor end, to a main switch and a fuse box located underneath the car. This, in turn, is connected to a contactor box which is operated by a C-503-A master-controller located in the cab at each end of the car. A type ML form E-3 master governor is mounted under a longitudinal seat in the front end of the car and connected to a snap switch in the operator's cab.

Cables from the connection boxes mounted under the cars are carried up through the car framing to the roof and all electrical connections between cars are made overhead by means of coupler sockets located in the ends of the car roof. A No. 00 bus line runs from end to end of each car, connecting the trolleys and DA-35G bus line coupler sockets, located in the ends of the cars. With the exception of the heater circuits, no metal conduit is



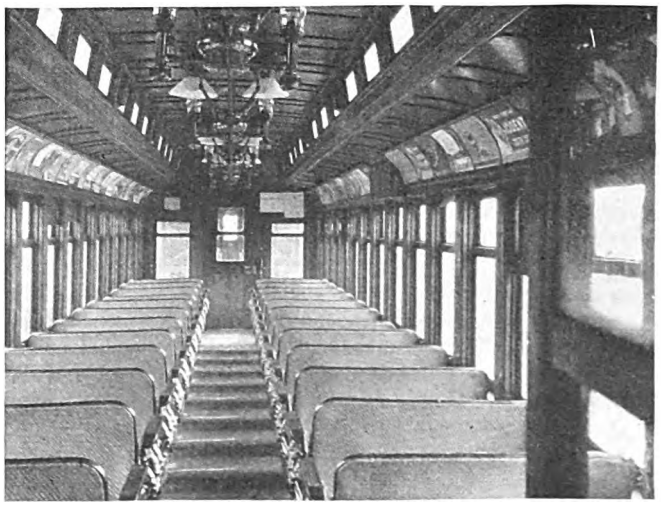
A two-motor Brill truck is provided for on each car

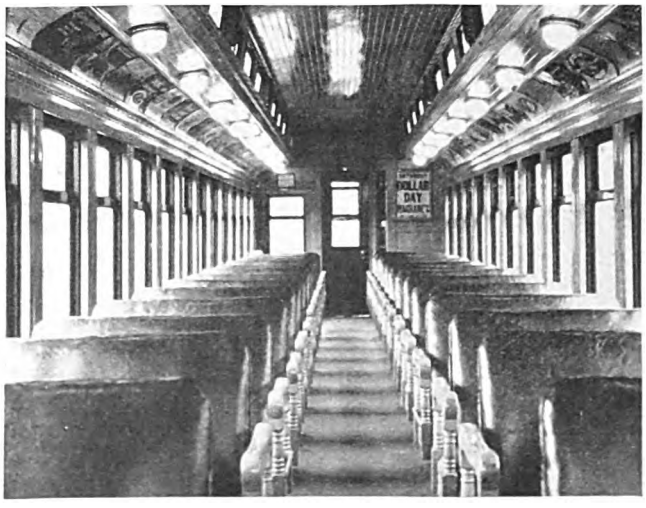


All electrical connections between cars are made by means of coupler sockets located in the ends of the car roofs

used in these cars. The control cables were grouped, taped and covered with a weather-resisting mulehide. The lighting circuits were run in wood moldings on the interior of the car mounted in the cove of the ceiling. The advertising signs are snapped in place over this molding, completely concealing it.

General Electric electro-pneumatic brakes are installed on each car. This equipment uses a brake valve, having an equalizing piston which functions to give a pneumatic service application if, for any reason, the electric brake is inoperative. There are five positions on the brake valve from left to right as follows: release, holding, lap, service, and emergency. In conjunction with this brake





At left, the old cars before electrification. At right, the same type of car refinished and electrified

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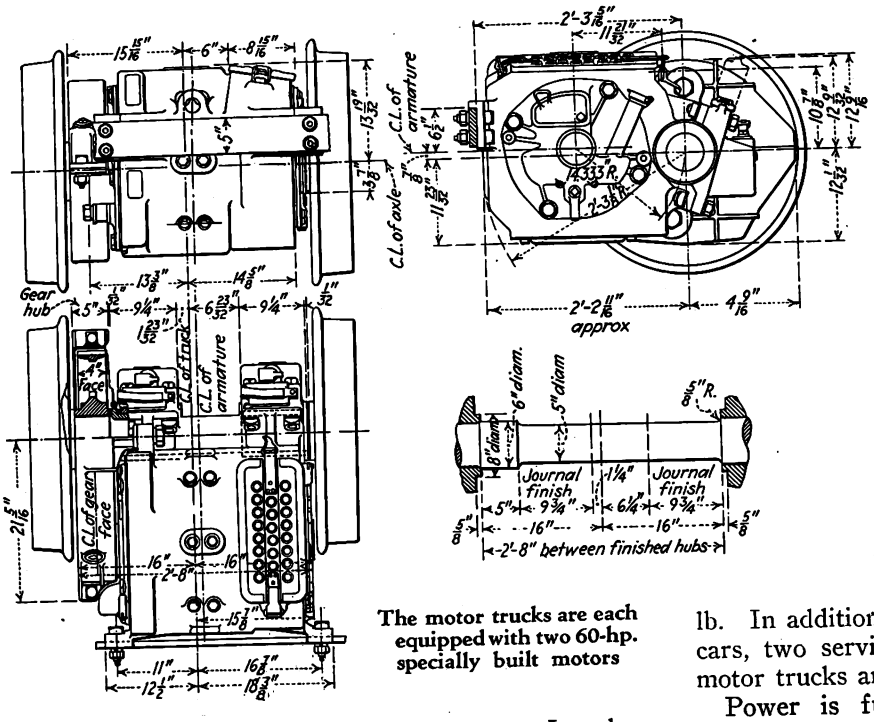


The motor trucks are each equipped with two 60-hp. specially built motors

valve is used a pneumatic duplex contactor. In release position of the brake valve the contactor is in neutral position. In holding position it is moved to the right and energizes the holding magnet. In lap, it is again in neutral position and in service or emergency position it is moved to the left and energizes the application magnet, causing the brake pipe reduction to take place at the application valve in service position, and at both the brake valve and application valve in emergency position.

In electric operation of the brakes, a service application is made in the regular way, and after the proper brake pipe reduction is made, the handle is returned to the holding position. In this position of the brake valve handle, the triple valve goes to release position, but the release or holding wire is energized by the contactor which, in turn, energizes the holding magnet and retains in the brake cylinder any air that has been admitted. The brake may then be graduated off by moving the brake valve handle between the holding and release position. The graduating actually being accomplished by energizing and de-energizing the holding magnet, which in turn seats and unseats the release valve in the magnet bracket.

In making an electric service application, the equalizing piston does not move as brake pipe air is being taken from the under side of the piston, past the application magnet valve, as rapidly as the equalizing reservoir air is being taken from the top of the piston. In making a pneumatic service application, no brake pipe air is taken from the underside of the equalizing piston, while equalizing reservoir air is depleting to atmosphere and consequently the higher brake pipe pressure raises the equalizing system, allowing the brake pipe air to escape to atmosphere at the brake valve. Brill brake rods and brake beams are used.

The cars, completely electrically equipped, weigh approximately 52,000 lb. In addition to the 60 electric cars and seven trailer cars, two service cars were equipped with two double motor trucks and using the type K-35-JJ control.

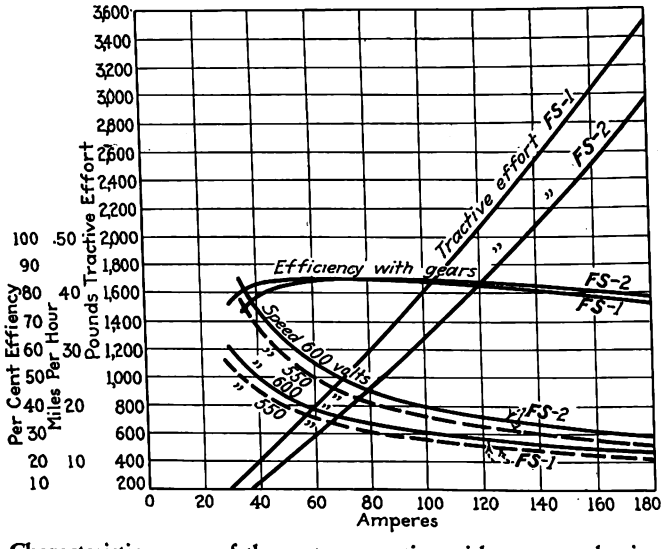
Power is furnished through two substations, one located at Orient Heights and the other at Lynn. The Orient Heights station is supplied by the Edison Electric Illuminating Company and the Lynn station by the Lynn Gas & Electric Company. The Orient Heights station furnishes power to all lines. The two 600-volt trolley wires from this station to East Boston are furnished with power by this station only, when under normal operation. The two trolleys from the Orient Heights station to Lynn are furnished power by both stations. The two trolleys on each of these sections are bonded about every ½ mile. The Winthrop loop is furnished power by the Orient Heights station and each trolley wire is completely insulated from the other. Any section of the line may be supplied by either station or a portable station. A 2,300-volt line parallels the track furnishing power to the signal system and other power apparatus.

The substation at Orient Heights is of the automatic type and contains two synchronous railway converter sets, of 650-volt, 1,000-kw. capacity. This station has four d.c. stub multiple-feed reclosing feeders, 650 volts, 2,000 amp., and one d.c. stub feed reclosing feeder 650 volt, 2,000 amp.

The two a.c. 13,800-volt incoming lines are provided with manually operated breakers which are tripped only on reverse current overload, indicating a line fault or a severe overload on the 13,800-volt bus or transformers.

An unusual feature in this substation is the system of ventilation. A steel housing is constructed over each machine, similar in shape to a blower housing. The rotation of the converter causes a draft of air to flow through this housing into a cavity in the floor. The air passes from this to a funnel leading to the ceiling. The warm air from the converter freely rises through the funnel and is expelled through the roof. A damper regulates the degree of temperature maintained. These housings are built in sections and bolted together so that they can be dismantled easily without disturbing the machine. The framework is built up of angles and covered with No. 8 sheet steel. The stack is covered with No. 18 sheet steel.

The substation at Lynn consists of a 1,000-kw., 650-volt converter set which is housed in the power house of the Lynn Gas & Electric Company. This substation is



Characteristic curves of the motor operating with a gear reduction of 3.77 and 30 in. wheels. FS-1, full field and FS-2, tapped field

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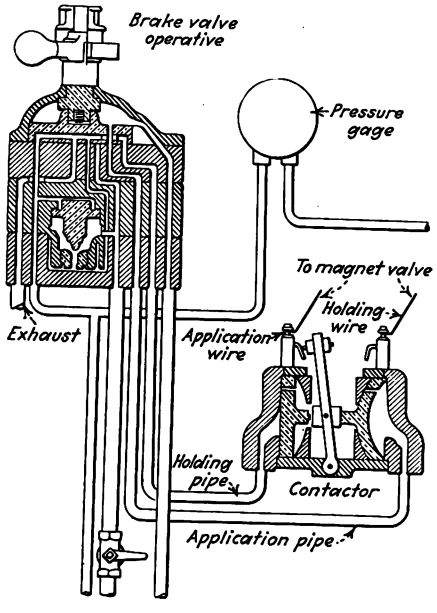
arranged for manual operation only, and is operated by the electric company's forces at a fixed charge.

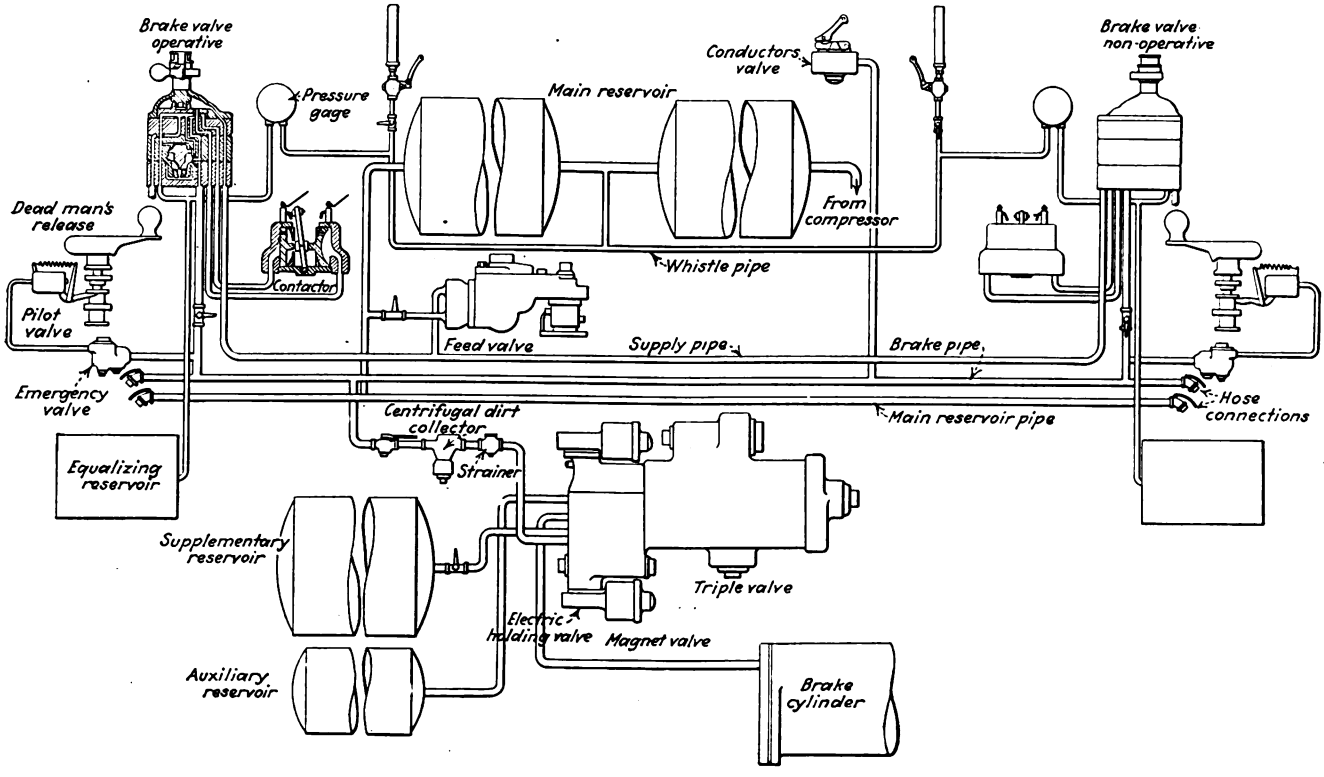
A portable substation is arranged to be connected to the line at either Orient Heights or the Lynn substation, as the 13,800 feed is available at these points. This substation consists of a 1,000-kw. unit of the manually operated type mounted in a cab on a steel car. The transformer and oil circuit breakers are mounted on the car outside of the cab, making it a complete portable unit. The estimated power consumption per year for the line is about 10,000,000 kw.-hr. The Lynn Gas & Electric Company will furnish 2,500,000 kw.-hr. of this and 7,500,000 kw.-hr. will come from the Edison Electric Illuminating Company.

The line installation presents a number of unusual features. The actual construction work performed under many handicaps and in record time without seriously interfering with the normal flow of traffic. Throughout the day trains operated on a fifteen-minute schedule, and during the morning and evening rush hours, work was interrupted by passing trains every ten minutes. For this reason, a large part of the construction program was carried on at night. Between the hours of midnight and 6 a.m. the trains operate on an hourly schedule, thus permitting the delivery of materials and equipment by a special night work train.

The catenary supporting structure consists of 262 corrosion-proof steel bridges, spaced at a maximum distance of 300 ft. The towers of the four-track bridges consist of 10 in. channel, 15.3 lb., tapering from 6 ft. centers at the base to the center of the top bridge channel at a height of 22 ft. 6½ in. above the rail. The towers are trussed with 2¼x2¼x¼-in., and 2x2x¼-in. angles. The top channel of the four-track bridge is 12-in. 20.7-lb steel, and the bottom channel is 10-in. 15.3-lb. steel. They are spaced 3 ft. 2 in. apart and trussed with 6x$\frac{5}{16}$-in. crimped bars. The general dimensions of the towers on the three-track bridges are the same, except for the upright channels which are 8-in. 11.5-lb. steel. The upper channel of this bridge is 10-in. 15.3-lb. steel, and the lower channel is 8 in. 11.5-lb. steel trussed with 5x$\frac{5}{16}$-in. crimped bar. The signal and power wires are run on steel crossarms supported at a height of 5 ft. above the top of the bridge by 2-5-in. 6.7-lb. channels attached to the upright channels of the towers.

Due to the marshy ground along most of the track, unusually large foundations were needed for the catenary supporting structures. The foundations are of concrete, being 7 ft. 6 in. deep, sunk 6 ft. below the surface, 8 ft. long, and 2 ft. wide. The foundations on the three-track towers are 6 ft. deep, 8 ft. long, and 2 ft. wide. All towers are anchored to the foundation by means of eight 1-in. bolts of 4 ft. 6 in. length. Signal and power supply





In conjunction with the brake valve of the electro-magnetic brakes a pneumatic duplex contactor is used which energizes the holding or application magnets

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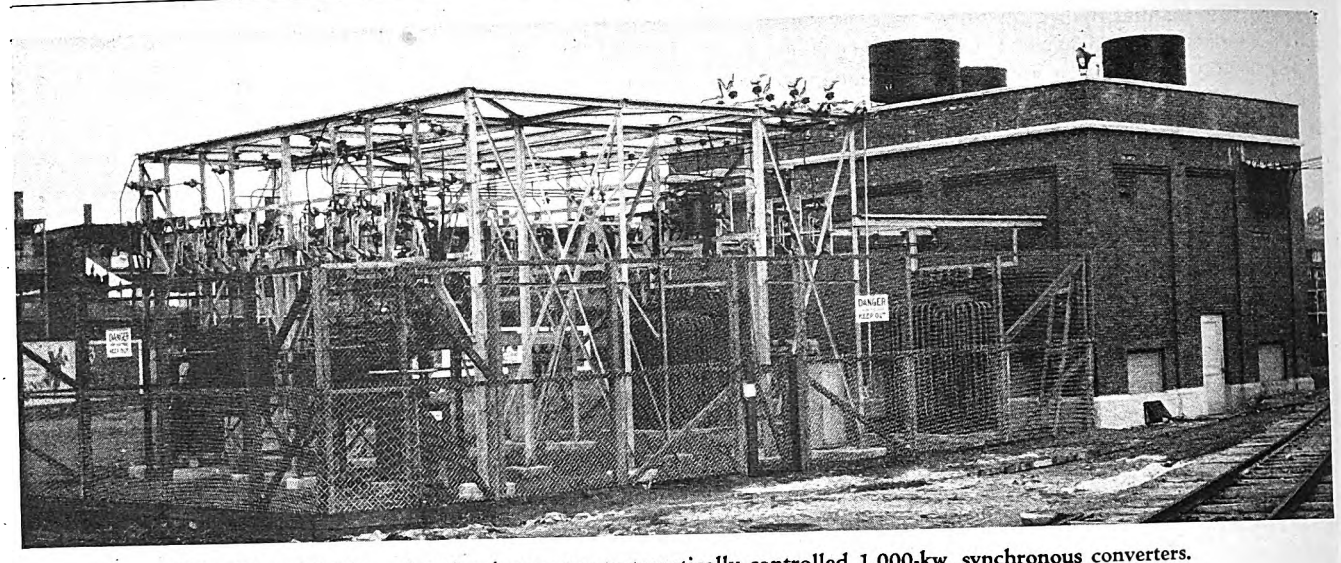
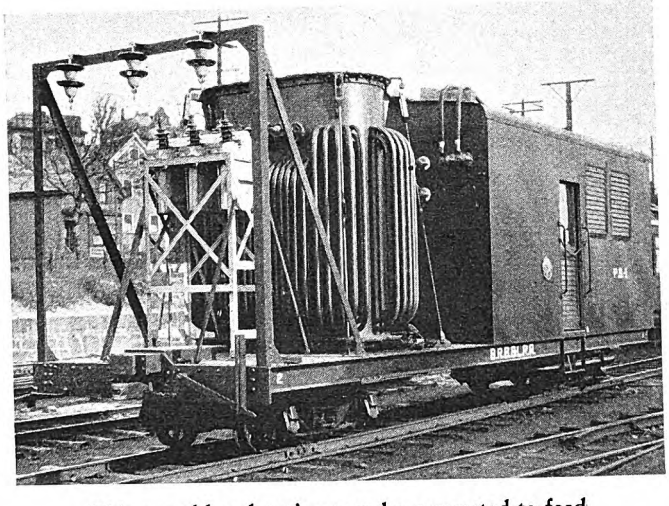


The Orient Heights substation houses two automatically controlled 1,000-kw. synchronous converters. Note the exhaust ventilators in the roof



This portable substation may be connected to feed any section of the line

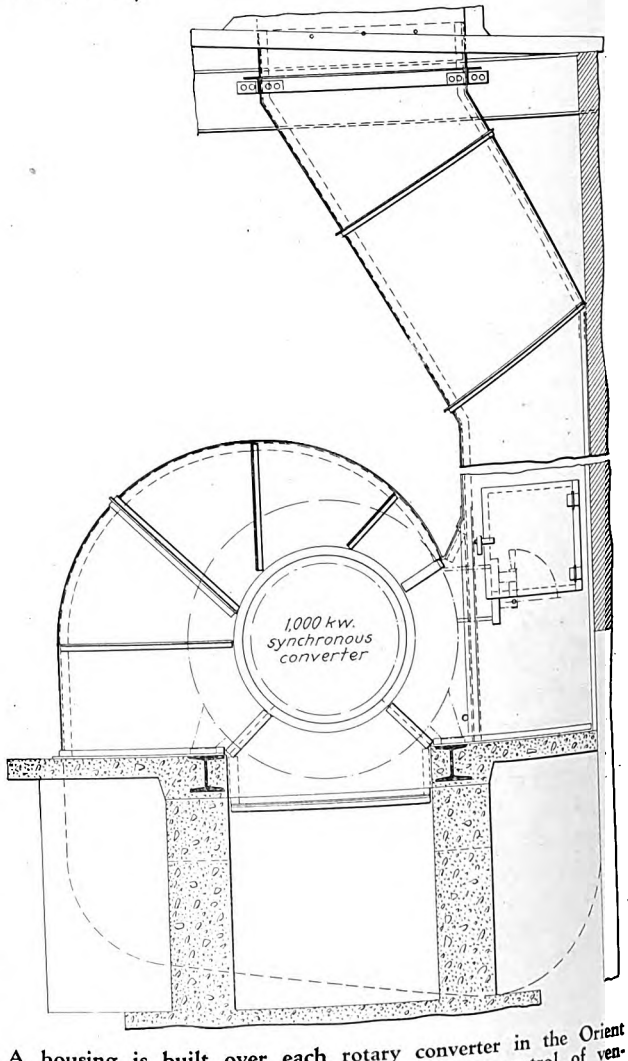
wires are carried on crossarms supported at a height of 5 ft. above the top of the bridge by two 5-in. 6.7-lb. channels attached to the upright channels of the tower.

To hold the trolley wire over the track on curves, steel pull-off poles were installed. These were set on concrete foundations at an angle, and laterally braced, no back-bracing being used. In all, 161 of these poles were used ranging in height from 18 ft. to 23 ft. 6 in.

For the reason that the required feeder cable had sufficient strength to support the No. 0000 grooved trolley wire, a 500,000 c.m. copper cable was used as both messenger and feeder for the entire system. Hitenso trolley wire was used, consisting of 99½ per cent bronze and ½ per cent cadmium. The messenger and trolley wire are bonded about every 600 ft. All hangers and castings are of non-ferrous material.

In the yards and siding, the overhead is direct suspension type. To prevent corrosion, all span wires are of red brass. No copper ground return is used on the system, the track being depended upon for the return. This is possible because all of the tracks are on a private right-of-way and there are few paralleling pipe lines to cause electrolysis.

The insulators supporting the messenger are G-E No. 294698, consisting of General Electric metal parts cemented to Locke insulators. The insulators supporting the short feeders running from the Orient Heights substation to the Winthrop branch lines are supported on this same type of insulator. The span wire insulators are Locke guy strain insulators No. 7664. The 2,300-volt signal and power supply line is carried on Locke 8,000-volt pin-type insulators No. 12. Due to the large number of overhead highway bridges crossing the track, about ½ mile of wood troughs for the trolley wire had to be installed.



A housing is built over each rotary converter in the Orient Heights substation, making possible proper control of ventilation and temperature

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Cars and Buses Dispatched by Telephone

A number of advantages follow the use of the telephone for dispatching in city service, as employed in San Antonio, Tex.

IN THE issue of Nov. 3, a brief reference was made to the practice in San Antonio, Tex., of dispatching cars and buses by telephone. This is an important feature of car and bus operation in that city. In fact the whole plan of service, according to the company's Coffin prize brief this year, is built around the company's telephone dispatching system. Particulars were given in these pages several years ago, but so much stress is laid by the company in its brief on the advantages of the plan that a more extended account will be published.

The dispatcher's office is located in the main office building near the superintendent of transportation, chief dispatcher, claim department and other offices. One P.B.X. board here is provided with direct connections to telephone stations at the end of each car and bus line, at main points along the route and at points of advantage downtown. This furnishes a network of direct channels of communication from the dispatcher's office to the train crews and to the supervisors on the entire system.

Train crews and bus operators are required to report to the dispatcher whenever they reach either end of each line. The dispatcher then makes a daily record of all such arrivals, so that he has a complete record of all car and bus operations on his "dispatcher's train sheet." On this sheet he shows the exact time that each car or bus reports at the ends of their respective lines throughout the day, as well as the time they are scheduled to be there. In case a car or bus is cut back short of the end of its route, the point on the line that the car was cut back is shown on the train sheet. Line set-backs, extra service, car changes, etc., are also recorded on this sheet, so that at the end of a day it shows not only the scheduled operation as planned, but the actual operation as to car spacing, delayed cars, extra service used, car failures and the effects of any interruption to service.

All dispatching orders are written, whenever possible. Owing to the nature of the business done, however, as the cars are in city service and the buses are not confined to a track, the dispatching procedure followed does not have to be as rigid as on a steam railroad or interurban line. Trainmen are encouraged to think for themselves and use their judgment in case of an emergency, even turning back, if necessary, though if this is done they are expected to notify the dispatcher of their action as soon as possible.

A necessary change in the service can be ordered by an inspector in emergencies, or he can request telephone authority for such a change from the dispatcher, who has authority to order the change first and then write the confirming order.

Telephone Has Other Uses as Well

The telephone system is not used exclusively for dispatching. All reports and all messages from the supervisor and trainmen regarding daily operation, such as car trouble, track and overhead trouble, accidents and blockades, come to the telephone dispatcher, who notifies the proper department. When doing so he gives the location and nature of the trouble and follows up this message with a written order. The dispatcher also keeps in contact with the tower wagons and track crews which are out working on the line, so that in case of trouble he can get in touch with them immediately.

As already explained, it is a rule that messages and orders regarding service or changes in service, or any message pertaining to the operation of cars, must go through the telephone dispatcher's office. In other words, the dispatcher's office acts as a message center and headquarters of operation.

The dispatching system also plays a large part in the system of checking up on what each man is doing. The fact that each trainman calls up at the end of the line not only serves as a check on his operation, but it encourages him to make every effort to reach his terminus and telephone in on time. Trainmen's times are also checked by road supervisors from time to time at different points along the line.

Advantages of Telephone Dispatching

The company lists eleven advantages of the company's system of telephone dispatching. Briefly, they are as follows:

1. The fact that each operator or motorman comes in direct contact with the main office once each trip stimulates his desire to run his car on time.

2. The system is popular with the trainmen because each knows that the man ahead of him cannot leave the end of the line ahead of time and so require him to carry an overload.

3. Knowledge of conditions permits the dispatcher to anticipate delays in time to prevent them. Thus, if a car is late, the dispatcher can get in touch with an inspector, who will help the operator get his car back on time before it gets completely out of schedule. Mechanical troubles with cars are reported by trainmen while they are calling in to the dispatcher. These troubles can then be fixed before they cause a delay. The same is true of track conditions and broken span wires.

4. Quick communication gives prompt knowledge of delays. Supervisors do not have to wait until they discover an exceptionally late car to surmise that there is trouble.

5. The means at hand permit quick rectification. The inspector can quickly summon car wagons, track crews, inspectors or an emergency trouble car and can order cars out of the barn to fill open spaces immediately.

6. The plan allows higher speed, because very little allowance need be made for delays, since the dispatcher can anticipate the delay in service or immediately install service after the delay. It is believed that over-all schedule speed, at least 10 per cent faster than would otherwise be possible, may be obtained by the use of telephone dispatching.

7. The system relieves lines inspectors of a great deal of their routine work of schedule supervision and permits a smaller number who can devote a greater amount of their time to instruction work and giving special attention to any men who are having difficulty.

8. Constant contact with the inspectors permits the dispatcher to get in touch with several of them more promptly to handle critical situations, and in emergencies concentrates them where they can do the most good.

9. Emergency crews may be kept constantly in production work yet be available for emergencies. The company believes that the saving in this factor alone more than pays for the entire cost of operation of the dispatching system.

10. Reports of accidents are transmitted immediately to the claim department because the train dispatcher can connect the trainmen directly with that department. This gives the claim department the advantage of immediate information.

11. The dispatcher's train sheet gives a complete record of the operation, both as to the movement of cars and of trouble.

Study of these train sheets on the causes of delay have been the means of greatly reducing the number and time of delays, as well as the number of late cars.

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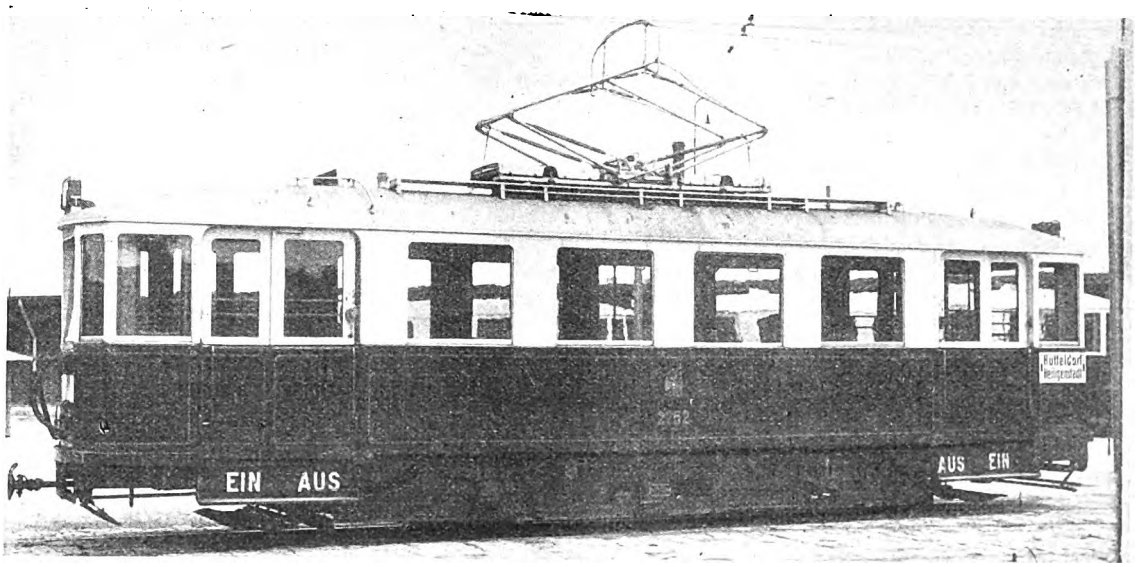
How Vienna Tramways

Handled the Schubert Festival

Transportation of an extra 100,000 persons to concert hall proved easier than moving a smaller football crowd. A review of Vienna's present facilities and traffic is included

By Walter Jackson
Fare and Bus Consultant



Standard motor car for surface lines in Vienna

ONE OF the mightiest musical gatherings of modern times occurred at Vienna during July, 1928. It was held to honor the centenary of Franz Schubert, who died 100 years ago at the early age of 31 years with a most astounding number of famous compositions to his credit. German singing societies came from all over the world to his native city for the event.

The concerts were given in a temporary hall holding 80,000 people. This hall was built on a meadow in the famous "Prater." This is a great chain of public parks, including a host of amusements, similar to those at Coney Island. The site was a fortunate one for the Vienna Municipal Tramways, which had provided station and storage facilities here in past years for handling amusement crowds. The storage capacity of the main terminal alone, known as the Hauptallee, was equivalent to 48,000 passengers.

The estimated number of visitors to the city was from 150,000 to 200,000, including 34,000 to 40,000 singers! During the peak of the festivities July 19-22, more than 100,000 persons had to be transported to and from the "Saengerhalle." To prevent interference with free car movement on the Hauptallee line, an underpass was constructed for pedestrians, and all cross travel over the tracks was forbidden by the police. The station was lengthened to 750 m. (2,445 ft.). As a result, it was possible to handle 120 three-car trains each way in an hour. Most of Vienna's cars seat only 24, but the regulations permit a maximum of 75 standees, 25 on each platform and 25 within the car body. The actual load per train varied from 160 to 180, and the traffic amounted to about 23,000 passengers per hour.

At one Praterstern terminal, five minutes' walk distant, 114 trains with 274 cars an hour carried another 16,000 people. At a second Praterstern terminal, 40 trains made up of 100 cars were available for another 6,000 patrons. A single route at Schüttelstrasse ran 24 trains with 48 cars to carry 3,000 passengers.

Thus it was possible to move 48,000 passengers an hour, of whom 34,000 were brought within easy reach of the concert hall.

Although this business, including general amusement riding, meant an addition of 500,000 rides a day to an average of 2,000,000, it was handled with remarkably little extra cost because most of it came outside the industrial peaks. No new trackwork was required, although a bridge was strengthened and the main station was enlarged. The chief item of expenditure was 10,000

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Personal pass with symbols on the picture side to show sections and areas in which the pass is valid. The names of these areas are written out on the side of the pass carrying the owner's name, address and signature

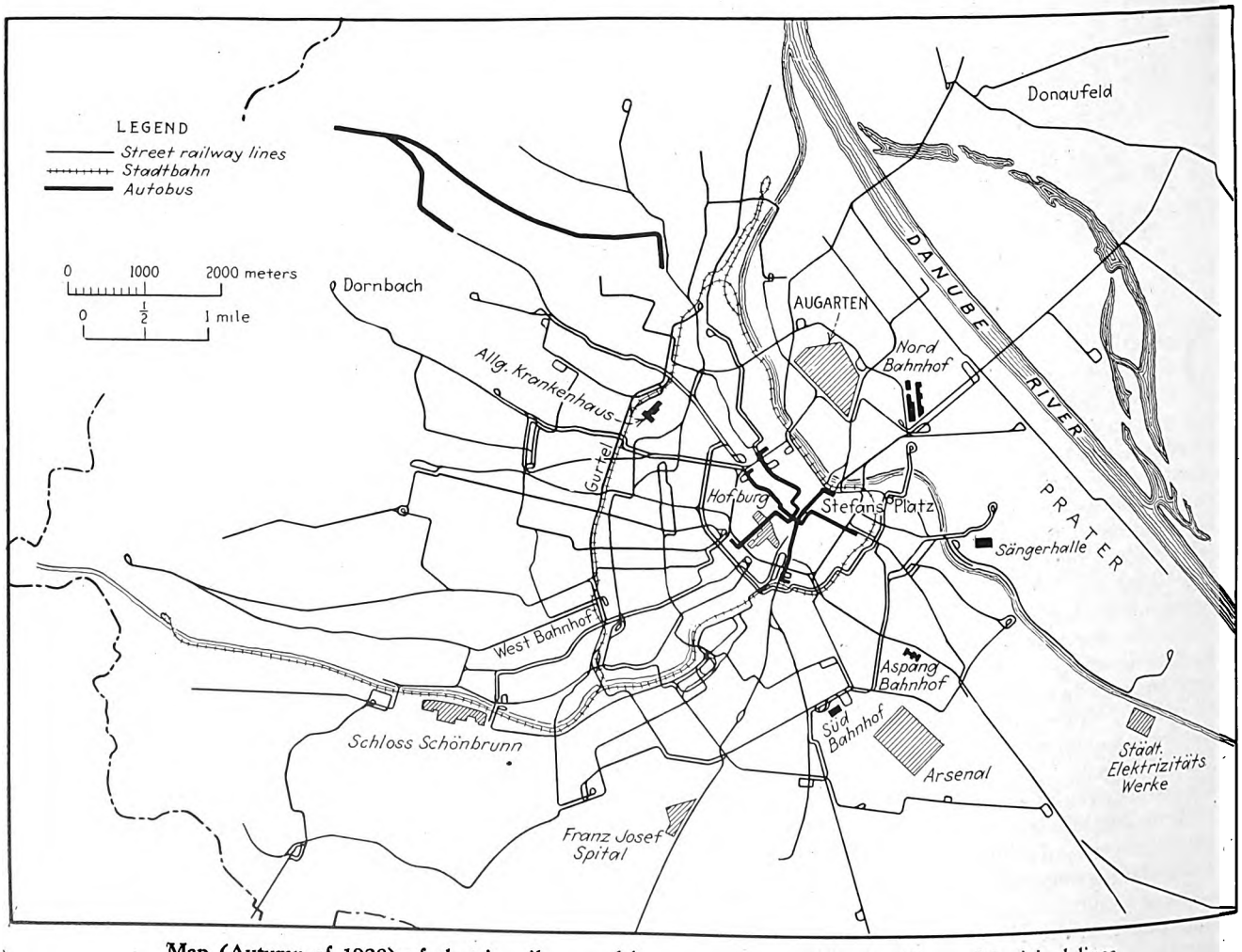
schillings ($1,400) for additional ticket-selling facilities. Shortage of transportation personnel was avoided by suspending all vacations between July 15 and 22. On their own account, also, the men volunteered to work more than the customary hours so that the visitors would feel that even under stress Vienna's transportation system was as efficient as it always has been courteous.

A gratifying feature of the traffic on the music festival days at the Prater was the absence of the sharp peaks that characterize such mass handling as a football crowd. The singers themselves began to arrive for rehearsal early in the morning and they would stay through to the night since there were plenty of restaurants near.

Many concert auditors also came an hour or two ahead of time to amuse themselves on the Ferris wheel, merry-go-round and miniature railway. The end of the concert did not see the Viennese rushing homeward with one mad impulse. Many preferred to stroll through the woods or to enjoy themselves on the various amusements before returning.

Specially marked dash signs in green paint were placed on all cars bound for the concert area. To aid the visitors further, two leaflets were distributed wherever visitors were likely to be. One leaflet dealt entirely with the routing and "last car" data during the five days July 18-22 when night services were extended 2½ hours. The second leaflet was prepared to speed the parting guests in helping to learn just what routes served the different steam railway stations and gave particu'ar care to night-train connections.

During the choral period, the Vienna Municipal Tram-



Map (Autumn of 1928) of electric railway and bus routes operated by the Vienna Municipal lines

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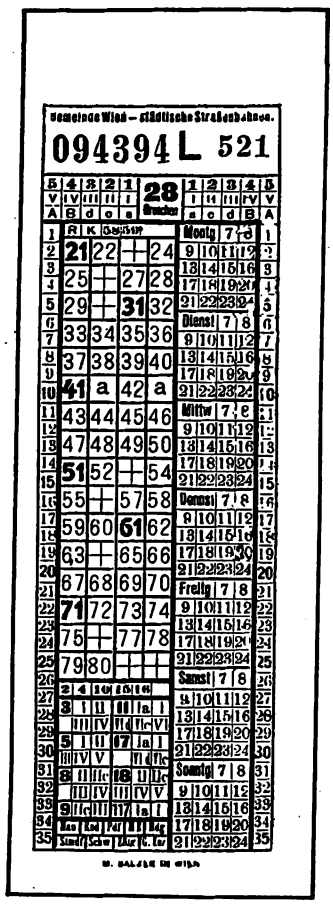

Above—Dog ticket good only on front platform of Stadtbahn smokers. Dog must be muzzled and on leash

At left—Standard combination fare receipt and transfer costing 28 groschen (3.92 cents)

ways also operated 230 special trains so that groups of singers could be transported en masse between their living quarters and the concert hall.

One fare novelty inaugurated early in 1928 was the sale of three-day, unlimited-ride, transferable passes for the special accommodation of tourists. For many years, the Vienna Municipal Tramways has sold non-transferable passes at a cost well under two ordinary fares a day. This was the first time, so far as the writer recalls, that Vienna passes were sold on the American basis of charging more than two full fares a day. This pass proved popular with the visitors because it relieved them from bothering with transfer regulations and the annoyance of paying extra fares for mistakes. Most Vienna fare receipts, serving also as transfers, have more or less arbitrary number markings that are a mystery to all but the regular rider over a given route.

Vienna Rolling Stock and Services

It has been mentioned that the extra business incident to the Schubert Festival was not allowed to disrupt the customary transportation of a city of 1,860,000 inhabitants. Although the average age of Vienna motor cars is nearly twenty years and only 50 motor cars (two 70-hp. motors) were new, the peak period found 97 per cent of the equipment on the job as against a normal ratio of 87 per cent.

For the city surface lines, which comprise 288 km. (179 miles) of route or 600 km. (372 miles) measured as single track, there were on hand 1,498 motor cars and 1,827 trailers. These are operated in two-car and three-car trains with one car reserved for smokers. There are 76 routes designated by letters or numbers. The average schedule speed is 9.9 m.p.h. with stops spaced 400 m. (1,312 ft.) apart.

TABLE SHOWING PASSENGERS CARRIED AND CAR-KILOMETERS RUN BY VIENNA MUNICIPAL TRAMWAYS

	Passengers Carried in Millions	Car Kilometers in Millions
1919 (a)	560.713	88.759
1920 (a)	481.495	86.556
1921 (a)	494.902	99.783
1921 (b)	272.985	54.166
1922 (c)	440.754	104.133
1923 (c)	458.475	108.412
1924 (c)	567.384	124.287
1925 (c)	601.510 (d)	141.006
1926 (c)	615.065 (d)	152.738

(a) Year ended June 30. (b) Six months ended Dec. 31. (c) Year ended Dec. 31. (d) Includes Stadtbahn.

The rolling stock of the system has shown a continuous, though slow, increase during the past fifteen years. This increase has been due in part, of course, to the co-ordinated operation of the electrified Stadtbahn. Thus at the end of 1913 the system comprised 1,451 motor cars and 1,550 trail cars.

The city cars are 11.6 m. (38 ft.) long over all, 6.1 m. (20 ft.) long over the seating compartment, 3.6 m. (11.8 ft.) wheelbase and 2.24 m. (7.34 ft.) wide. Their average weight is 29,370 lb. Bow collectors are used with a line potential of 600 volts.

For the Stadtbahn, which is an electrified belt and suburban railway with 26.5 km. (16.4 miles) route or 61 km. (37.8 miles) single-track measurement, there were on hand 180 motor cars and 230 trailers. These cars are operated in trains of five to nine cars at running speeds up to 40 km. (24.8 miles) per hour and schedule speeds up to 24 km. (14.9 miles) per hour. Pantograph collectors are used for the line potential of 750 volts.

During the summer of 1928, the motorbus operation of the Vienna Tramways was still confined to the trackless center of Vienna, "The Inner City," except for a single motor bus line in the northern portion of the city and a short trackless trolley line connecting with this suburban bus line. In 1927, 34 buses were operated over 26 km. (16.1 miles) of route. Some of these routes were only 800 m. to 1,000 m. (2,624 ft.—3,280 ft.) long, yet the two-minute to four-minute headways and extremely low fares of 9—10 groschen (1.26 cents —1.40 cents) produced 22 passengers per bus-mile! Before the end of 1928, the Vienna Tramways expected greatly to enlarge its bus operation through the development of a series of express and pleasure routes to suburban areas.

In round numbers, the relative importance of each class of traffic during 1927 was as follows:

Street railways, 630,000,000 passengers with 138,000,000 car-km. (85,560,000 car-miles) or 7.3 passengers per car-mile.

Electrified stadtbahn, 100,000,000 passengers with 21,000,000 car-km. (13,020,000 car-miles) or 7.7 passengers per car-mile.

Motorbuses, 11,400,000 passengers with 837,000 car-km. (518,940 car-miles) or 22 passengers per bus-mile.

A peculiar feature of the Stadtbahn is the fact that but 10,000,000 to 12,000,000 of the 100,000,000 riders did not use surface line transfers. At the height of its pre-war business, when operated as part of the State Railways, the Stadtbahn carried only 40,000,000 riders a year. It is apparent, therefore, that operation of this line, in conjunction with the surface lines, has greatly increased the value of the Stadtbahn through permitting travelers to make combinations that will save time.

The Stadtbahn is leased for 30 years from 1924. though with the right of the Government to cancel the lease after ten years. Under this lease the Vienna Municipal Tramways supplied rolling stock that can be used on the surface lines should this become necessary.

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How Tools Speeded Track Reconstruction in Honolulu

No. 1. The old track became badly rutted as well as worn.

No. 2. The first process was the removal of the old concrete paving with air drills.

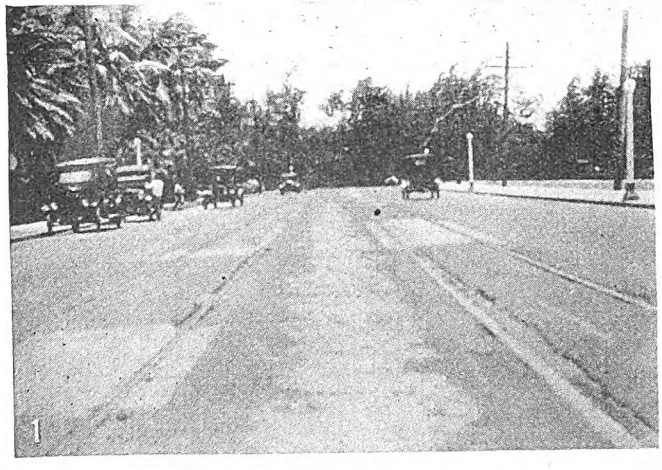
No. 3. The final touches to the excavation.

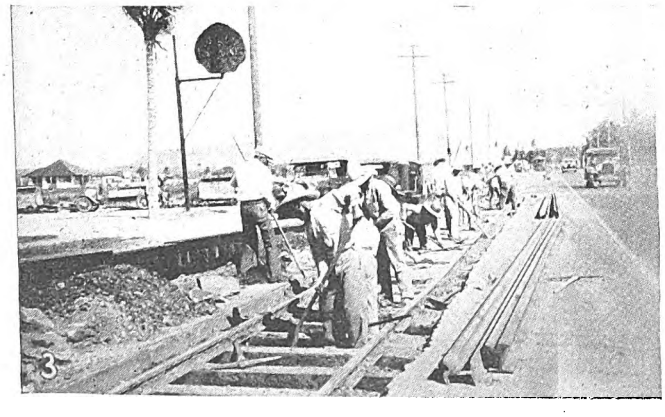
No. 4. A section of 500 ft. of track ready for night displacement.

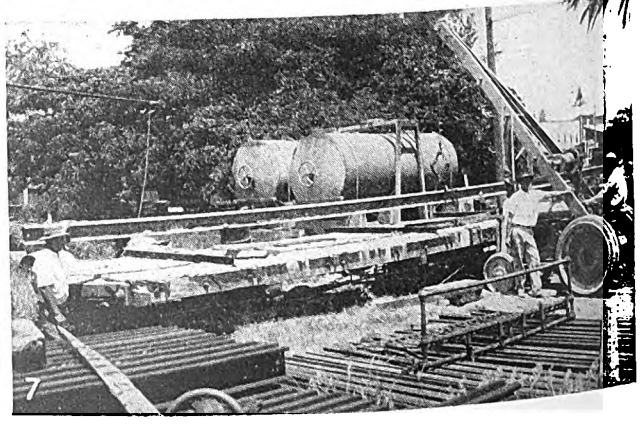
No. 5. After the joints are seam-welded, this track will be ready for new paving.

No. 6. A section of the finished track.

No. 7. This tractor crane was of great help. It is shown here loading rails on a flat car.







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Rail Replacement in Hawaii

Honolulu Rapid Transit replaces 5,000 ft. of 70-lb. A.S.C.E. T-rail track with 122-lb. Trilby rail

By E. de Harne
Roadmaster Honolulu Rapid Transit Company

NOT LONG AGO the Honolulu Rapid Transit Company decided to renew the rail on about 5,000 ft. of track in paved street. The old track built in 1917 consists of 4⅝-in. 70-lb. A.S.C.E. T-rail, laid on wood ties. The original ballast was set deep enough to permit re-railing this section of line with a 7-in. rail. The old paving between the tracks was of concrete with a line of wood blocks inside each rail. Wood blocks were used outside both rails.

The new track, which the company decided to lay, consisted of 7-in. 122-lb. grooved rail of the Trilby section, laid on creosoted redwood ties. To this rail the fish plates were seam-welded and the nuts of the bolts were spot-welded to the plates. No bonds were used. Concrete paving 7 in. deep was installed, carried to additional depth of 4 in. under the rails and between the ties. An asphalt squeegee surface was applied.

Since the grade had to be lowered, 2⅜ in. re-railing had to be done at night while the cars were not running. This was accomplished by removing the old rail and installing the new rail for 500 ft. of track each night by a force of twenty men and a 1-ton Fordson tractor crane. The Fordson crane, used for the first time for handling all rails, resulted in a big saving in track and roadway labor. The rails were hauled to the job with a flat motor car. Six weeks were required to complete the job, and the cost was found to average $6.94 per linear foot. Track and roadway labor averaged $0.86 per linear foot, and total labor $2.28 per linear foot.

Freight Is Principal Subject at Coming C.E.R.A. Meeting

SEVERAL men prominent in the industry, headed by J. P. Barnes, president of the American Electric Railway Association, have been secured to address the Central Electric Railway Association, which convenes in Indianapolis, Ind., on Jan. 24-25, 1929. Addresses will be delivered on the opening morning by Mr. Barnes, L. Ert Slack, Mayor of Indianapolis, W. S. Rodger, general traffic manager Eastern Michigan Railways, and R. N. Van Doren, vice-president and general counsel, Chicago & Northwestern Railway.

The afternoon of the first day has been set aside for the general subject of freight. Following a report of the committee on pick-up and delivery of freight, a paper will be read on "The Trend in the Development of Pick-Up and Delivery Freight Service," by L. G. Tighe, assistant general manager Northern Ohio Power & Light Company. D. R. Thomas, president of the Electric Railways Freight Company, will present a paper on "Advantages of Freight Consolidation."

Papers to be presented at the second day's session include "Traffic and Schedule Making," by J. R. Ong, transportation engineer Cincinnati Street Railway; "Interurban Operation, Possible Economies and New Methods," by C. T. Dehore, president Indianapolis & Southeastern Railroad, and "Personnel," by W. P. McCarter, supervisor of instruction Milwaukee Electric Railway & Light Company. These will be followed by the reports of committees and affiliated associations, and election of officers. The association dinner and dance are to be held on the evening of the first day.

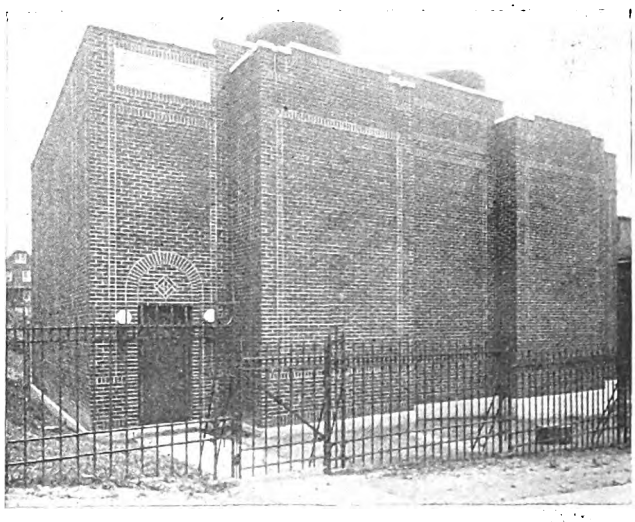
The executive committee of the association will hold two meetings at Indianapolis, one preceding the opening session of the convention and another after adjournment of the final session on the second day.

Attractive Substation Serves Four Pittsburgh Lines

By M. R. Sumner
General Superintendent of Construction
Byllesby Engineering & Management Corporation, Pittsburgh, Pa.

NO SACRIFICE of attractiveness was made by the Duquesne Light Company in constructing its new Maple automatic substation, even though the structure was built economically. It was erected in a residential section but is a distinct asset to the neighborhood. The building itself is well designed, but to add to the appearance an ornamental iron fence was erected along the front of the lot.

Located in Wilmerding, Pa., about 12 miles from Pittsburgh, this railway substation supplies current to



An ornamental iron fence adds to the attractive appearance of the new building

TABLE I—EQUIPMENT OF THE MAPLE SUBSTATION OF THE DUQUESNE LIGHT COMPANY

Starting and running oil circuit breakers, type B-2, three-pole, single throw, complete with contactors and operating mechanism.
Load limiting resistors 0.030 ohms, 4 units.
Field discharge resistor, 2 units.
Synchronous converter, six-phase, shunt-wound.
Potential transformer, outdoor, three-phase, 22,000-11,000/110 volt.
Air break switch, three-pole, single throw, motor operated, type PM.
Air break switch, three-pole, single throw, gang operated, with grounding blade, type PM.
Air break switch, three-pole, single throw, gang operated, type PM.
Switchboard complete for control of two 1,000-kw. synchronous converters.
Storage battery, 60-cell, type OG-13.
Battery charging set, one-phase, 60-cycle, 220-volt motor and 140-volt d.c. generator.
Air compressor.

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including telephone lines, cost $95,000; land improvements, grading, seeding and fences added $4,000; outdoor switching structure, exclusive of equipment, cost $3,000, and poles, fixtures, overhead and underground conduit lines, engineering, insurance, etc., amounted to $17,000, making a total cost of $153,000. Construction of the station from authorization of the work to the official opening occupied just eight months.

Utility Association Secretaries Meet in New York City

CLOSER co-operation between regional organizations and the national headquarters of the various public utility associations was the principal topic of discussion at the seventh annual conference of Utility Association Secretaries which met in New York City on Dec. 3-4-5, 1928. The delegates were the guests of the A.E.R.A. during the first day of their conference. The meeting at association headquarters was opened with an address of welcome by General Secretary J. W. Welsh. Managing Director Storrs spoke briefly on the present status of the electric railways of the country, and was followed by Frank R. Coates, chairman of the committee for co-operation with state and sectional associations, who made a plea for closer relationship between the various regional associations, through their secretaries, and the national headquarters organization in New York City. Labert St. Clair, of headquarters staff, read a letter from President J. P. Barnes, expressing his regret at his inability to be present, and commending the regional secretaries for the work which they were doing for the utilities in their respective spheres. The morning session concluded with an inspection of the A.E.R.A. offices under the auspices of Mr. Welsh and members of the staff.

Reconvening in the afternoon, the conference was addressed by George B. Cortelyou, chairman of the joint committee of the national utility associations. Members of headquarters staff then spoke briefly, outlining the duties of their respective departments.

On the second day of the conference the delegates were the guests of the American Gas Association, and on the third day of their stay were entertained at the headquarters of the National Electric Light Association, the program in both cases being under the direction of the secretaries of the associations named. President E.. F. McKay presided over the sessions, with O. E. Weller as secretary. At the concluding session, Mr. Weller, who is secretary of the Rocky Mountain Division of the N.E.L.A., with headquarters in Denver, was chosen as president for the ensuing year, with Harold A. Buck, Harrisburg, Pa., as secretary. The date and place for the next meeting was fixed for the first week in December, 1929, at Chicago.

Kentucky Utilities Meeting

THE annual meeting of the Kentucky Association of Public Utilities will be held at the Brown Hotel, Louisville, Ky., on Jan. 15 and 16, according to an announcement which has just been made by the secretary, Edward F. Kelley.

On the afternoon of Jan. 15 and the morning of Jan. 16 business sessions will be held in the Roof Garden. The annual dinner will be in the Crystal Ball Room on the night of Jan. 15.

Two Hundred Dollars for a Single Idea

PERHAPS the very job that you were doing this morning has prize-winning possibilities. Are you familiar with the opportunities offered in ELECTRIC RAILWAY JOURNAL'S maintenance contest? Read about the prizes that can be won and the rules and conditions of the contest as given in the Oct. 20 issue of the JOURNAL, or send for copies of an instruction folder giving full information.

Progressive maintenance men always keep their eyes open and their minds alert for new ideas. They look ahead. They want to know what is going on not only in their own field of work but in the industry as a whole. The maintenance contest offers opportunities not only for obtaining new ideas for your own work, but also for creating interest and co-operation in the work of your department. At the present time much rehabilitation and improvement in equipment and methods is going on among electric railways. Results have been most gratifying both as to the performance obtained and the savings effected. It is with the thought of giving increased stimulus to such programs, and of bringing to light further commendable accomplishments, that the various prizes have been offered in ELECTRIC RAILWAY JOURNAL'S contest.

There are twelve $25 departmental prizes to be awarded to individuals sending in winning maintenance ideas. These will be divided equally between the following four maintenance divisions:

1. Rolling stock and shops
2. Way and structures
3. Electrical and line
4. Buses and garages, including shop equipment for bus maintenance.

The most attractive prize of all will be the $200 individual prize, to be awarded at next year's anual convention to the person submitting the best maintenance idea during the contest.

Company and departmental recognition are features of the new contest. A company trophy will be presented, and departmental certificates of merit will focus attention on the improved methods and equipment that are being originated by electric railway maintenance forces. For each item published $5 will be paid, whether it wins a prize or not.

Now is the time to start sending in your material. The more you submit, the bettter chance you have of winning one or more of the big prizes. Look up the announcement in the Oct. 20 issue of the JOURNAL or send for copies of the instruction folder.

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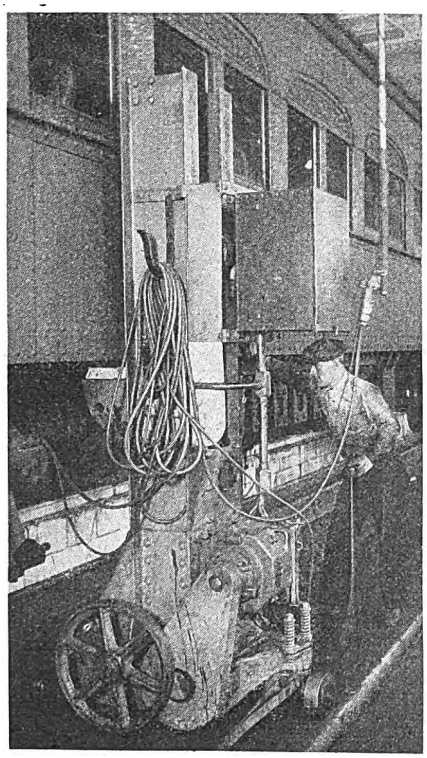
BETTER MAINTENANCE Through Improved

Raising Car Bodies for Oiling Bearings*

By Harvey L. Bullock
General Foreman of Electrical Equipment
New York Central Railroad,
White Plains, N. Y.

FOR oiling the center and side bearings of its cars, the New York Central Railroad, at its White Plains, N. Y., shops, uses two standard Whiting electrically-operated jacks to raise the car bodies. With this equipment the oiling crew can grease all of the center and side bearings on a train of cars, as it comes into the shop for inspection, in a very short time.



Raising a car body with a standard car jack to oil the center and side bearings

Jacks are placed near one end of each side of the car to be greased, and are both raised simultaneously. Current for operating the jacks is supplied from the overhead trolley through a pole with a contact. One man controls the operation of both jacks. In the accompanying illustration showing the raising of a car body, the control button is in the hand of the operator.

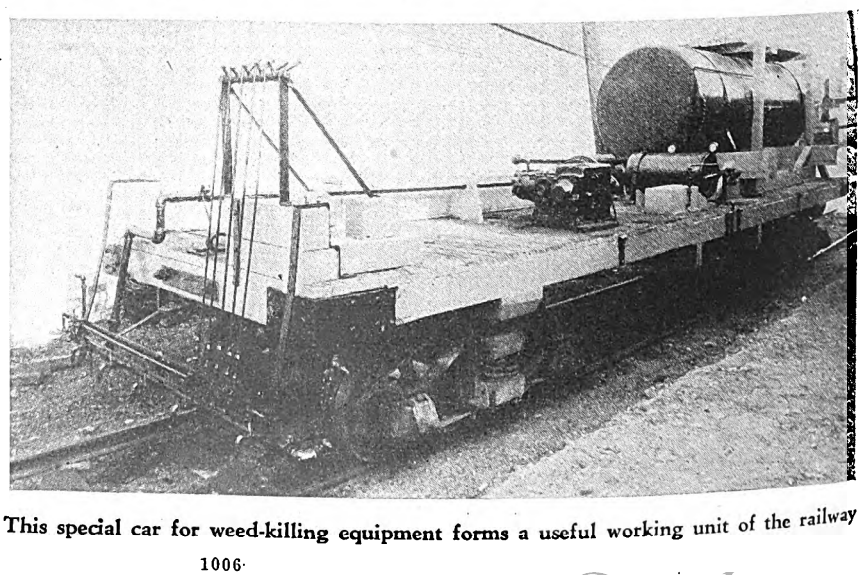
A long length of cable reaches from the contact pole to the jack, and is then looped over a hook. Connection between the jacks is by a lead with plugs, and standard receptacles on each jack are provided so the lead can be removed when not in use. With this arrangement one man raises the car body, while the crew does the oiling. The jack is then rolled to the next position, and the operation repeated until the entire train has been greased.

*Submitted in Electric Railway Journal Prize Contest.

Special Car for Weed Killing

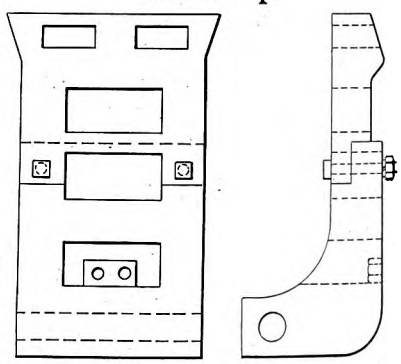
TO FACILITATE the killing of weeds along its right-of-way the Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio, installed a complete weed-killing outfit on one of its flat cars. Inasmuch as such a car is used only two or three times in a year on a small property, a large outlay is not warranted. The car is 35 ft. long, is mounted on 24-in. wheels, and has standard spray piping and control valves located at the front end of the unit.

The Chipman weed-killing solution is carried in a 40-bbl. steel storage tank fixed securely in position at one end of the platform. A car type of air compressor is mounted amidships of the car together with an air reservoir for maintaining 12 lb. pressure in the large solution tank. The car is equipped with hand brakes and is ordinarily operated in conjunction with a company work car at an average speed of 12 m.p.h. A regulation headlamp plug provides the means of conveying electrical energy to the air compressor of the weed car from the trolley circuit of the motor car.



This special car for weed-killing equipment forms a useful working unit of the railway

Renewable Third-Rail Shoe Tip



Adoption of this contact shoe has resulted in a great saving in maintenance expense, and its operation has been entirely satisfactory

WHEN the cars of the Staten Island Rapid Transit Railway, Staten Island, N. Y., were put into service they were equipped with third-rail shoes somewhat similar to the de-

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Methods

sign shown in the sketch, but of one piece. It was soon found, however, that the expense of shoe maintenance was very high, because, when the contact surface became worn or the tip broken it was necessary to replace the entire shoe from the fulcrum to the top. The cost of the casting plus the cost of the replacement labor amounted to a large sum.

The shoe shown in the sketch was designed and installed to decrease this cost. This shoe is made in two parts, a fulcrum casting and a tip casting. The joining points are machined accurately to assume perfect contact when bolted together. In case the tip becomes worn or broken, it can be replaced in a few minutes by removal of the bolts.

Preventing Signal Relays from Sweating

IN A REPORT of the Signal Section of the American Railway Association which was presented at the section's annual convention there are some recommendations which should prove of value in maintaining signals for electric railways. A section on the prevention of sweating of relays is as follows:

1. Relay housings, including the door, shall be non-metallic, or metallic, with non-metallic lining.

2. Non-metallic housings and non-metallic lining of metal housings shall be constructed so as to close as near airtight as practicable. The outside metal housing shall be ventilated by openings near the bottom and the top of the housing, the openings covered with wire gauze to exclude dirt and insects, and hooded to exclude rain.

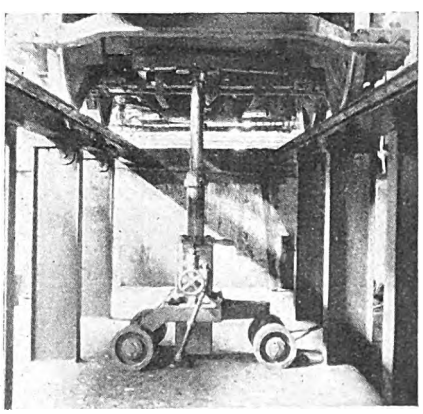
3. The voids between and around the wires at the point where they enter the relay housing shall be filled with a compound that will seal the opening and exclude moist air from the conduit leading to the housing. Where housings with open bottoms are mounted on concrete foundations, the surface of the concrete shall be covered with material that will prevent the entrance of moisture into the housing.

4. Glycerine in a small open container placed inside the relay housing has been found to be beneficial. Moisture-absorbing chemicals, except glycerine, shall not be used on account of injurious corrosive action.

5. Relays should be sealed as nearly airtight as practicable.

Trackless Lift Convenient for Handling Equipment*

By C. B. Hall
Chief Clerk Mechanical Department Virginia Electric & Power Company, Norfolk, Va.



Portable lift in place for removing a pair of 34-in. steel wheels

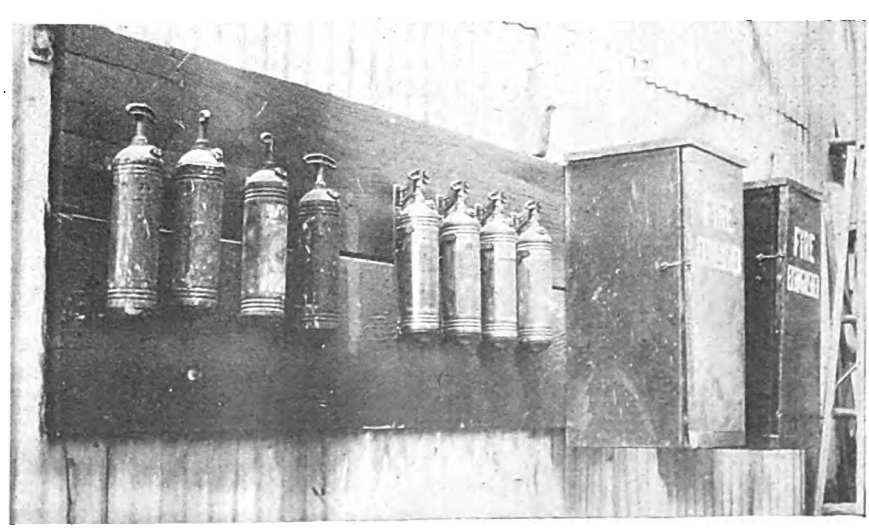
USE of a portable lift in the shops of the Virginia Electric & Power Company, Norfolk, Va., has resulted in better maintenance of equipment by simplifying the labor of handling. The machine is a self-contained type designed to remove and replace car motors, wheels, etc. It has a telescopic ram and does not require a sub-pit. It is mounted on flat, broad wheels so that it can be moved easily. The ram and cylinder are steel, and pump valves and pump pistons are bronze. There is a side adjustment of the cylinder of 2 in. The weight of the machine is 700 lb. and it has a lifting capacity of 3,000 lb. The length is 37 in., and the over-all height, with ram closed, is 32 in. Use of this lift has resulted in a considerable saving in the time and labor of removing and replacing equipment under cars without jacking up the car body.

Submitted in Electric Railway Journal Prize Contest.

Chemical Fire Extinguishers Centralized

STUDY of the fire fighting apparatus in the shops of the Richmond Railways, Inc., Staten Island, N. Y., led to a new arrangement of the chemical extinguishers. Heretofore they were placed around various parts of the shop but it was found when an emergency arose that confusion developed, resulting in a loss of time in procuring the necessary extinguishers. All extinguishers are now centralized on a common rack in one location in each department and are accessible from all directions. The accompanying picture shows a typical arrangement of the extinguishers installed in the paint shop. In addition, a multiplicity of water and sand pails are located conveniently throughout the shop.

With the new arrangement every man knows exactly where the extinguishers can be found, and confusion and delay are prevented when an emergency arises.



Fire extinguisher board in the shop of Richmond Railways, Inc.

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News of the Industry

Philadelphia Men Sworn in as Special Officers to Speed Traffic

Thirty-seven men picked from the personnel of the Philadelphia Rapid Transit Company, Philadelphia, Pa., for their experience in expediting traffic, have been sworn in as special officers and assigned to the central city area to co-operate with the city's traffic police in measures calculated to relieve congestion.

The P.R.T. supervisory force, according to an announcement made by Ralph T. Senter, president of the company, will assume responsibility for all public transportation in the district between Spring Garden and South Streets, 34th Street and the Delaware River. They will wear a distinctive uniform of military gray.

"The company evolved this plan," said Mr. Senter, "as a logical phase of co-ordinated operation of all forms of surface transportation.

"Our men will in no way attempt to usurp the authority of the city traffic personnel."

In commenting on this move the Philadelphia *Ledger* said:

The installation of this special force is unique and anomalous. Since the city is unable to provide the needed numbers of traffic police to cope with conditions where the congestion is greatest, it should be glad to accept the assistance of men who have a direct interest in doing their job efficiently and for the benefit of the greatest number. They will be on the streets to answer the question, "how to speed up traffic for the 80 per cent," and as the interests of the P.R.T. and the large majority of the users of the streets are identical, they will have great opportunities for usefulness.

Daily Meetings on Chicago's Ordinance

Representatives of the Chicago transit companies and members of the City Council sub-committee on local transportation have decided to consider the proposed traction ordinance at once, and to meet every day until they have agreed upon the draft of the new ordinance, or until they definitely have reached an insurmountable obstacle.

The draft as it now stands has been approved by the Council sub-committee. It provides for a rate of return of 5½ per cent on the $257,000,000 investment represented by the present elevated and surface lines and that additional capital shall be put in at cost. The companies have been asking a 6½ per cent return on the present capital account, plus one mill per revenue passenger and a compromise of this must be effected.

Attorneys for the companies insist that the 6½ per cent return, plus the compensation feature, is imperative at the present time, and that future rates could be determined by the proposed local transit commission. Some of the Aldermen, however, desire a fixed contract so that the rate of return will never be higher than the amount finally agreed upon. This point will be put aside temporarily until all other negotiations have been completed, both groups agreed.

The city is also asking that interest be paid on its $53,000,000 traction fund, which is to be invested in the bonds of the new unified company. Objections originally raised on this point by company representatives have been withdrawn. The question of length of time the franchise should run has been tentatively agreed upon as that specified in the ordinance draft, which provides for termination upon purchase. It is estimated that the city can purchase the consolidated system within 40 years out of its share of the company's profits.

Both groups are now confident that the ordinance will be in shape to submit to the City Council after Jan. 1. If approved by the Council, bills authorizing the city to call a special public referendum on the ordinance could then be submitted to the State Legislature, which convenes in January.

New Fares in Effect in Baltimore

Rejecting 10-cent flat rate, commission authorizes 8¾-cent ticket rate. Supplemental opinion reviews depreciation contention. Company contests return rate

BALTIMORE car riders are now paying 10 cents for single cash fares and 8¾ cents when tickets or tokens are purchased. The new rates authorized by the commission and announced in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 30, are an increase from 9 cents cash or three tokens for 25 cents.

In handing down its latest order the commission accompanied it with a supplemental opinion in part as follows:

In obedience to the mandate of Circuit Court No. 2 of Baltimore entered Aug. 31, 1928, in accordance with an opinion of the Court of Appeals, in the case of Harold E. West, et al., versus the United Railways & Electric Company of Baltimore, filed July 16, 1928, this commission on Monday, Nov. 19, 1928, entered upon a rehearing of Case No. 2648, in so far as it concerned the annual allowance for depreciation on the property of The United Railways & Electric Company of Baltimore made in the opinion and Order No. 12639 of the commission, filed Feb. 10, 1928.

The order of Circuit Court No. 2 of Baltimore directed the commission to further consider the question of depreciation, determine the proper allowance for depreciation in accordance with the opinion of the Court of Appeals, and make any change in the rate schedule which may be necessary and requisite.

In its opinion and Order No. 12639, this commission allowed 5 per cent of gross revenue as a proper amount to be set aside for depreciation upon the company's depreciable property. The amount so estimated for the year 1928 was $883,544. This allowance of 5 per cent of the company's gross annual revenues was made first in 1912, the year in which a depreciation reserve was set up by the company, and it has continued since. It has provided for current retirements of the company's property at cost, and permitted the building up of a reserve, at the beginning of the year 1928, of $1,413,739. The plan of providing for retirements at cost is that followed by the Interstate Commerce Commission and the utility regulatory commissions of most of the states, and by all other utilities under the jurisdiction of this commission.

The commission, therefore, did not feel justified, in the circumstances, in departing from the generally observed rule of allowing depreciation on a basis of cost.

The company's contention that value, and not cost, is the proper basis upon which to calculate depreciation was sustained both by Circuit Court No. 2 of Baltimore and by the Court of Appeals.

In its opinion the Court of Appeals asserted that while there is authority for calculating depreciation on the basis of cost, "in our opinion it is artificial, illogical and unsound, and ought not to be approved." The court continues:

"Since we cannot say that proper methods would not have produced a result which would have affected the rate schedule adopted, the case should be remanded to the commission in order that it may consider and determine the proper allowance for depreciation in accordance with rules hereinafter stated, and if necessary readjust the rate schedule to cover any changes it may make in that allowance."

Later the court declares:

"In such a case as this we are . . . dealing . . . with substantive rights protected by constitutional guaranties, and there seems to be no logical reason why the depreciation should not be based upon the actual value of the property itself, rather than upon vague and conjectural inference drawn from the money the property earns. . . . But even so, if the conclusion actually reached was proper, the fact that it was reached by improper methods, would not justify us in disturbing it, so that the more important question is whether the base of the calculations by which it was tested was itself lawful. And that depends upon whether the commission should have based its allowance for depreciation upon the original cost of the prop-

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erty, or upon its present value. It actually did use cost and not present value as the basis of its conclusion, and here again it must be said that there is authority for its procedure. But in our opinion it is justified by neither law nor right reason."

Inspection and Investigation of Property

The court directed the commission to make a physical inspection of the property and an investigation of the probable useful life of the property as shown by the experience of this company and other companies using similar properties in a similar way and to make an estimate, based in part at least upon such an investigation of the probable annual depreciation. This the commission has done.

The annual amount claimed by the company for depreciation was $2,200,000. This, however, in the opinion of the commission, provided for certain extraordinary obsolescence, which the Court of Appeals declares the commission does not have to allow, and which it does not allow. H. Carl Wolf, chief engineer of the commission, under whose direction the commission's investigation and physical inspection of the property were made, testified that the fair amount to be allowed for depreciation, based upon the fair value of the property, is $1,687,068. Charles Nodder, chief auditor of the commission, approaching the problem from another angle, that revealed by the experience of the company as shown by its books, testified that the amount required for depreciation, based on present fair value, is $1,269,565.25.

The commission carefully has considered all the testimony and exhibits before it in this case bearing upon the problem of depreciation, and finds that $1,638,660 is the proper amount to be allowed the company for depreciation. This allowance is based upon the present value of the company's depreciable property, in accordance with the court's order, and equates to 3.6 per cent of the amount testified to as being the value of the company's depreciable property, $45,518,344.

In determining this allowance it is assumed that the existing practice, with respect to the division between charges for maintenance and charges to the depreciation reserve, will be continued.

The allowance of $1,638,660 is an increase of $755,116 over the allowance previously found, which was based upon the cost of the company's property, and necessitates an increase in the rate of fare from 9 cents cash or three tokens for 25 cents to 10 cents cash or four tokens for 35 cents. Other fares will remain as established by Order No. 12639.

The commission will pass an order in accordance with the findings herein stated.

Amended Order Defines Fare

In the order passed by the commission on Nov. 28, it amended its order of May 26, of this year, to read in part:

That from and after midnight on Nov. 30, 1928, and until the further order of the commission, The United Railways & Electric Company of Baltimore shall be permitted to charge and collect for the transportation of persons over its several street railway lines in Baltimore and vicinity, a base rate fare of 8⅓ cents when tickets or fare checks are purchased, or 10 cents cash, for the conveyance of each passenger over twelve years of age, and 5 cents for each child between the ages of four and twelve years, between any of the points designated in the schedule of the said company or between intermediate points, in either direction, on any of such lines, except in so far as the zones on any of the said lines are hereinafter modified or changed.

Rate of Return Made An Issue

The United Railways & Electric Company has decided to appeal from the action of the Maryland Public Service Commission. The case is to be taken to the United States Supreme Court. President Emmons said that the United is being discriminated against and that refusal to permit the company to receive an adequate return has caused it a loss of $15,000,000 in the last two years through depreciation of securities. This is a point that has been reiterated previously. He said:

It has been decided to proceed with an appeal to the courts so that the question of the sufficiency of the rate of return, as previously fixed by the Public Service Commission at 6.25 per cent, should be decided as promptly as possible by the Supreme Court of the United States in order that this problem, of so much importance to the entire public of Baltimore and the future of the street railway system, the investors of Baltimore and elsewhere who hold securities of the United Railways, as well as the company itself, may be finally settled.

Not only do we feel that the 6.25 per cent return is confiscatory, but it stands as an economical barricade in front of the company and as a menace to the future railway transportation in Baltimore. When other Maryland utilities are allowed a 7½ per cent return, and the railway is confined to 6.25 per cent return, the investor naturally will lend his money to the company which the state treats more liberally.

The public will need new cars in the future of a more convenient type and more perhaps in line with the comforts of buses, and also better facilities generally for transporting passengers quickly and comfortably. All of this requires money on a very large scale.

If it cannot be obtained the future of transportation in Baltimore is in a bad way, indeed, and it cannot be obtained until the background of credit given the company by public authorities is sufficient to attract investors.

We feel it is understood by the general public that the recent increase allowed by the commission is for the purpose of maintaining the property itself, and does not include any item at all for increased service or facilities.

Another Railway Problem

SEVENTY citizens of Hudson, N. H., have appealed to the Public Service Commission to take action that will relieve them of annoyance in the way of interrupted radio reception. The petitioners believe that the trouble is caused by operation of electric cars from Hudson bridge to Hudson center and they point to confirmation of their opinion in the fact that it does not exist when the cars are not running. They ask the commission to take such action as may be necessary to remedy an "exasperating condition."

Report of Rolling Stock Committee

Outlining of work and discussion of best methods of getting information for reports occupied the attention of the general rolling stock committee at a meeting held at association headquarters, New York City, on Dec. 5. Those present were A. T. Clark, chairman; W. S. Adams, C. Bethel, J. M. Bosenbury, J. A. Brooks, R. S. Bull, M. R. Hanna, G. C. Hecker, E. J. Jonas, J. S. McWhirter, A. D. McWhorter, T. H. Nicholl, H. A. Otis, M. W. Rew, H. Savage, R. B. Smyth, C. W. Squier and W. T. Vivian.

Changes in the procedure for making reports and the dates at which they must be presented were outlined by Mr. Clark. The committee on revision of the manual will undertake to add several standard axles to those already available, and the rating of others will be increased. The progress being made in testing of various drives under the direction of the committee on car design was outlined. The Westinghouse drive is now under test. The General Electric drive is being set up for testing, and the Timken drive is on the way.

In addition to further studies of lighting the subcommittee on this subject will devote added attention to headlights for city cars. The committee on noise reduction will devote special attention to track construction that bids promise of providing quiet operation.

There was considerable discussion on the work being done by committee No. 10 on welding of wheel flanges. The amount of work of this character being done by electric railways is increasing very rapidly, and this has led to a preference for grinding wheels instead of turning them in a wheel lathe, as in many cases the amount of metal necessary to be removed for truing up the contour is very small. Present grinding equipment for this use, however, is very costly, and railways hesitate to make such a large investment.

The committee agreed that wood preservation in car and bus construction is a worth-while subject for study by the wood preservation committee. The next meeting of the committee will be held at Cincinnati about the middle of March. At this meeting all committees of the rolling stock division will be expected to get their reports in shape. All members of rolling stock special committees are invited to attend this meeting, and others interested in rolling stock will also be invited.

Mayor Wants New Operating Agreement with P. R. T.

The City Council's transportation committee will meet shortly to act on Mayor Mackey's request for authority to negotiate a new operating agreement with the Philadelphia Rapid Transit Company for the Broad Street subway in Philadelphia, Pa.

The Mayor sent a special message to

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Council on Dec. 3 pointing out that the three-month lease expired Nov. 30, that the P. R. T. had discontinued its payments of $200,000 a month for operating privileges, and that a new contract would have to be executed pending the completion of the South Broad Street unit.

On a day-to-day basis the company is now operating the city-owned line. The new agreement will be made retroactive to Dec. 1.

More Militant Moves in Detroit

Recent developments in Detroit include moves on the part of Mayor John C. Lodge to banish jitney service of any kind from Detroit streets unless the jitneys are municipally owned and operated; to evict the Detroit Motor Bus Company's buses from the streets; to have two subway plans placed upon the ballot at the April election so that the voters may take their choice. One of the subway propositions would be the comprehensive subway plan of the Rapid Transit Commission, estimated to cost $280,000,000. The other would be a subway dip plan with an estimate of cost, for the relief of traffic congestion in the downtown streets.

It is believed that the Mayor's suggestion relative to the eviction of the Detroit Motor Bus Company will be taken up shortly after the holidays. Just what the Mayor's plan will be has not been announced. The bus company is operating in Detroit without a franchise. The one objective strived for, Mr. Lodge stated, is absolute control of the city's transportation facilities, in order that the transportation system be made all exclusive and under the sole authority of the municipal government.

The Mayor stated that it is very evident that the people want an opportunity to express their views as to whether the city should proceed with the so-called dip system or go ahead with the comprehensive subway idea.

Three Measures for Transit in St. Louis to Be Presented

The Transportation Survey Commission of St. Louis, Mo., on Nov. 21 indorsed three measures to be presented to the Missouri General Assembly when it convenes at Jefferson City, Mo., on Jan. 2. The bills are intended to secure for St. Louis the necessary powers to establish a rapid transit system.

One measure will confer the right to construct subways and elevated tracks for rapid transit and to assess part of the cost against property found to be benefited by the improvements. Another would give the city the right of excess condemnation of property affected by public improvements. Such a measure would speed up the preliminary arrangements for the rapid transit system. A third measure is designed to increase from 20 years to 50 years the limit for which the city may issue bonds. To attain this the Missouri constitution must be amended by popular vote. There is to be a state-wide referendum on this subject.

Franchise Negotiations Started

City and company at Akron begin discussions on which to base new grant. Riders interested in quality of service

NEGOTIATIONS between the city of Akron and the Northern Ohio Power & Light Company for a new franchise based upon the recent report of the citizens' fact-finding committee were begun during the week ended Dec. 8. It is understood that the company will suggest an initial fare of 10 cents with a ticket rate of fare in line with that now existing. The present rate of fare in Akron now is 7 cents cash, four tickets for 25 cents, seventeen tickets for $1.

The company is operating under a temporary franchise which expires on Feb. 15. It is generally recognized that some increase in fare is justified, but the question to be determined is just how much advance should be made with the interests of the city and the company joined. One of the local newspapers, *The Beacon Journal,* suggests that the present cash rate of fare should be continued. *The Times-Press* has refrained from suggesting a rate of fare.

In a statement made public by A. C. Blinn, vice-president and general manager of the company, attention is called to the fact that the company has upon several occasions endeavored to bring about economies suggested by the citizens' fact-finding committee, and the suggestion is made "that it must be borne in mind that the service to the car riders is of first consideration and car riders do not want anything done that will affect the quality of service."

As Mr. Blinn sees it, "there is very little duplication of service, if any, that can be avoided. Where all transportation lines come into the business district, there must be certain duplication on the main thoroughfare or at the point of concentration." He continues:

It should be understood that a reasonable increase in fare does not always result in decreased riding. Akron is one of the very best examples of this fact. In 1925 there was an increase in the number of car riders over 1924, notwithstanding an increase in fare. The constant increase in the popularity of the 10-cent bus lines in Akron is another evidence that a reasonable increase in fare does not decrease the number of riders. Requests have been continually made for additional 10-cent bus lines. Our experience is that the public is primarily interested in good service and is willing to pay for it.

If the fare increases had not helped transportation companies of this country, most of them would be in receivers' hands today.

The report of the fact-finding committee contains a complete survey of the transportation situation in Akron and it certainly removes the subject from demagogic debate, reducing it to a point where the problem may be discussed upon a practical, common sense and business basis.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Dec. 10-12 — National Highway Traffic Association, annual meeting, Automobile Club of America, New York, N. Y.

Jan. 14-18, 1929—American Road Builders' Association, convention and road show, Cleveland, Ohio.

Jan. 15-16—Kentucky Association of Public Utilities, annual meeting, Brown Hotel, Louisville, Ky.

Jan. 22—New York Electric Railway Association, mid-winter meeting and dinner, Hotel Commodore, New York, N. Y.

Jan. 23-25—Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.

Jan. 24-25—Central Electric Railway Association, Claypool Hotel, Indianapolis, Ind.

Jan. 25-26—Central Electric Railway Accountants' Association, Claypool Hotel, Indianapolis, Ind.

Jan. 28-Feb. 1—American Institute of Electrical Engineers, annual convention, 33 W. 39th St., New York, N. Y.

Feb. 7-8—Midwest Electric Railway Association, Midwinter meeting, Robideaux Hotel, St. Joseph, Mo.

Feb. 14—Central Electric Railway Master Mechanics' Association, Youngstown, Ohio.

Sept. 28-Oct. 4—American Electric Railway Association, 48th annual convention and exhibit, New Public Auditorium, Atlantic City, N. J.

Successors to Detroit Jitneys Popular

The de luxe bus system established on Woodward Avegnue on Nov. 25 has proved very popular and the Department of Street Railways has expressed confidence that these buses are more than filling the needs for transportation formerly met by the jitneys. The number of buses has been increased on the Woodward line and on Dec. 1 operation was started on the Grand River Avenue line. More buses are being added to the Grand River line as they are delivered by the manufacturers.

Rerouting in New Orleans

Important changes in the routes of eight street car lines of the New Orleans Public Service Company are proposed in maps and plans now in the hands of Public Utilities Commissioner William T. Hall, and will be submitted to the Commission Council at the next meeting. The changes were agreed upon after conferences attended by experts of the city and planning and zoning commission, Commissioner Hall, and engineers of Public Service.

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Special Rates on Fredonia Line

A new tariff of the Buffalo & Erie Railway, Fredonia, N. Y., has been approved by the Public Service Commission effective Dec. 26. It provides special car rates between stations on its lines and for round trip transportation of not more than 50 persons per car. The person designated as being in charge of the party will be required to purchase a special car ticket naming the station to and the station from, the rate and the number of persons in party. Such tickets will be good for round trips on the special car.

Plans for Freight Service Being Perfected

Final arrangements are fast being made for divisions of the Texas Electric Railway between Dallas and Waco, Dallas and Corsicana, and Dallas and Denison to handle freight shipments, of carload and less than carload lots, in interchange with steam railroads with which the three divisions intersect. An hourly schedule of movement and delivery of freight will be observed in the service, in which the latest type of 50-ton electric locomotives will be employed.

The major portion of freight in and out of Dallas will be handled at night by the company. Cars loaded along the lines outside of Dallas, for destination in any section of the United States, will be hauled to the nearest junction point and turned over to the steam road.

More than 230 miles of track belonging to the Texas Electric Railway have been brought under this electrification of freight service, which is the first service of its kind to Texas shippers.

Another Branch of Pennsylvania Operates Electric Trains

The Pennsylvania Railroad added a link on Dec. 2 to its extensive electrification project when the 6:42 a.m. train from West Chester, Pa., arrived in Broad Street Station under electrical power. The Octoraro branch, the latest to be electrified, follows the tracks of the Wilmington branch as far as Woodlands Cemetery in West Philadelphia, then branches off to Wawa and West Chester. It comes a distance of 27½ miles. Service from Wawa to Oxford and Perryville is being supplied by gas-electric cars, with the exception of one mail steam train daily. The Wilmington branch began electric operation Sept. 29. From three to eight minutes have been cut from the running time.

St. Louis to Have Services of R. F. Kelker

Rudolph F. Kelker, Jr., senior member of the engineering firm of Kelker, De Leuw & Company, Chicago, has been selected by the Transportation Survey Commission of St. Louis, Mo., to act as its engineer and aid in planning a rapid transit system for the city and its environs. It is believed that the survey will cost approximately $35,000 and that it will take about eight months time for the study to be completed.

Mr. Kelker will examine all previous reports on the transportation and traffic problems of St. Louis and make such additional investigations which may be found necessary. Reports with recommendations will be submitted to the Transportation Survey Commission from time to time. His studies will include street car and bus routing, with recommendations to provide the most efficient routing and co-ordination with the St. Louis plan.

Growth of One-Man Car System in Indianapolis

Service with one-man cars has just been introduced on the Northwestern Avenue line of the Indianapolis Street Railway, Indianapolis, Ind., bringing the total of subordinate lines thus served in that way to eighteen. With the exception of service on four important trunk lines of the company and three shorter lines, one-man operated cars gradually have been put into use in the last two or three years. Joseph A. McGowan, secretary and acting president of the company, said the one-man cars were being introduced on lines where service had decreased as a matter of economy, so that the character of the service should not be permitted to decline.

Rerouting of street cars will be the next phase of traffic congestion relief to be attacked by the City Council in Indianapolis, Ind. A change in routes of cars of the Indianapolis Street Railway to keep as many as possible off the main thoroughfares and two minor ones are being contemplated with a view to eliminating right turns at congested corners.

Electrification Saves Small Texas Road

A short electric line in West Texas has been made a paying proposition. This line, the Roby & Northern, now handles passengers, freight, express and mail on regular schedule and according to the last report made by company officials is earning a fair return on the investment.

Yet six years ago the old steam line was about to abandon. Its 5 miles of track were in bad condition and its meager equipment was no better. Citizens petitioned the West Texas Utilities Company, which had built its transmission lines into Roby and was serving the community with light and power, to purchase the line. The purchase was effected and in 1923 a rebuilding program was started, which has resulted in replacements in track, equipment and terminal facilities and, from accounts, successful operation.

Opinion Recommends Niagara Bridge Investigation

A report has been received by the Niagara Falls, Ontario, City Council from a special committee appointed to investigate the alleged swaying of the Falls View Bridge of the International Railway across the Niagara Gorge at Niagara Falls. The committee recommends an investigation of the span by the Dominion Board of Railway Commissioners, the Queen Victoria Park Commission, the railway and representatives of the state of New York. "We are of the opinion that this swaying is sufficiently pronounced to indicate that the bridge lacks stability in a lateral direction," says the report. It was accompanied by signed and sworn statements from fourteen persons giving their personal experiences in which it was claimed the bridge on occasions had a lateral sway from 18 to 24 in. and that during such periods the railway had deemed it wise to take precautions in regulating the volume of trolley, vehicular and pedestrian traffic.

Dismissal of Protest Against Philadelphia Fare

The United States Supreme Court dismissed a taxpayer's suit against the Philadelphia Rapid Transit Company, Philadelphia, Pa., on Dec. 4, for want of a substantial federal question. The suit was brought by George Sambor when the company advanced its fare to 8 cents.

The suit was instituted against the railway on behalf of the taxpayers of Philadelphia to enforce the contract of 1907 restricting the fare to 5 cents for 50 years. The refusal of the federal Supreme Court to intervene makes final the action of the United States Court in Pennsylvania in dismissing the case.

Rapid Transit Issue Revived in Pittsburgh

Some years ago the people of Pittsburgh, Pa., expressed themselves as favoring a start toward a subway system when they approved a bond issue of $6,000,000 for that purpose. But the issue had not been passed before it was realized that $6,000,000 would not even pay for a good beginning. As a result nothing definite has been done. The disposition was to mark time and this attitude continued until the fate of the constitutional amendment to permit the assessment of benefits upon a whole district was known. To the disappointment of advocates of the subway, the vote throughout the state was adverse, and that plan will have to be abandoned for some years to come at least.

As the *Post-Gazette* sees it, this result should stimulate those not in sympathy with the subway to advance their proposals more energetically. In fact, F. L. Duggan, vice-chairman of the Pittsburgh Better Traffic Committee, said the subway suggestion should be abandoned and work started on the widening

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of Fifth Avenue as a substitute. In support of his view Mr. Duggan said that "the bus is here to stay while the subway is a thing of the past. Give Pittsburgh a few more wide thoroughfares and we will surpass our sister cities in traffic progressiveness." The *Post-Gazette* says:

There will be no denial that buses have come to stay, but whether they will replace other forms of transportation or merely serve as an auxiliary to them has not been demonstrated.

The subway may be ruled out as too expensive for Pittsburgh, particularly in view of the defeat of the district assessment plan, but widening of the arteries leading to the triangle, without doing anything for the latter, would simply aggravate the downtown situation. To that conclusion every discussion of the subject has pointed for the past twenty years. Possibly it will be found expedient to take some of the surface cars to a subway level within the triangle only and abandon the longer subway proposals linking East End and Northside in favor of widened streets. The important thing at the moment, however, is to bring the subject up again for prompt action—with a view always towards permanent relief, not a mere makeshift that will hardly be completed before it is found to be hopelessly inadequate and unsatisfactory.

One-Man Car Line Suspends

Service on the Evans Avenue, McKeesport route, of the Pittsburgh Railways, operated at a 3-cent fare, was suspended on Nov. 27. This action followed the adoption of a resolution by the McKeesport Council condemning operation of one-man cars on the route. Thomas Fitzgerald, vice-president of the railway, suggested to the Mayor that the matter be threshed out before the Traction Conference Board. Mr. Fitzgerald stated that the operation of one-man cars was started "only after the most careful consideration of all elements involved in the situation, including that of safety." Only three cars have been withdrawn from service. They provided fourteen-minute service on the Evans Avenue route with a "tripper" car operated during the peak of traffic, giving eleven-minute service. The route they covered is approximately 2½ miles long, and cars are heavily loaded only at noon, when many people take advantage of the 3-cent fare to go home to lunch, and during the rush hours at night.

Another Festivity in Cleveland

The Cleveland Railway, Cleveland, Ohio, will hold its first annual Christmas party for employees and their families in the Cleveland Public Auditorium on Dec. 19. In addition to everything customarily associated with Christmas parties, there will be an indoor circus.

A few days prior to this activity the railway chorus will sing for inmates of the Soldiers and Sailors Home at Sandusky, Ohio. The chorus is directed by Charles G. Dawe, director of the Orpheus Male Choir, which won first prize in the Welsh National Eisteddfod in 1925.

Foreign News

Traffic Co-ordination in London Seemingly Nearer

Co-ordination of all transportation in London has become seemingly nearer through a resolution adopted by the London County Council at an all night session on Nov. 6-7. At present, most of the buses and rapid transit lines in London, with some of the tramways in the outskirts of the city, are in what is known as the "underground group," while the tramways in the County of London are municipally owned. The resolution adopted by the County Council was that steps be taken to enable it to enter into agreement with the Underground Electric Railways and others, for a common management and a common fund. What these arrangements are to be will have to be determined in the future. It is expected that the plan will not involve a change of ownership of the London County Council Tramways as was made to appear in press dispatches to the United States, but simply a direction of the property and a pooling of its earnings. On March 31, 1928, the debt of the London County Council with respect to its tramways was £8,692,987.

An Idea from Japan

"KIND WEEK" has just been celebrated on the Japanese railways. The Tokio Railway Bureau decided that all porters and other station employees should "wear permanent smiles, put luggage down gently, and bow every time they are addressed." In addition, some 200,000 leaflets were distributed among passengers asking them not to be hard on the railway employees.—*New York World.*

Guatemala Railway Suspends

Electric railway traffic on the Los Altos Railway, between San Felipe and Santa Maria de Jesus, in Guatemala, has been suspended indefinitely until connection is made at Quezaltenango. There have been numerous accidents on this railway and very little passenger traffic.

Argentina Tramway Strike Settled

After having been in progress for 33 days, the tramway strike in Rosario, Argentina, has been settled and service resumed. According to the terms of settlement, both sides have made more liberal concessions than they were disposed to consider at the beginning of the controversy. The settlement came as a surprise to many, as serious consideration was being given by the Mayor to commandeering the company's plant and vehicles.

Presentation to Alfred Baker

The members of Tramways Committee at Birmingham, England, and the chief officials of the department on Oct. 25 entertained at dinner Alfred Baker, formerly general manager of the city tramways, who retired from his post recently on account of ill health. Various complimentary speeches were made, and Mr. Baker was presented with an illuminated copy of a resolution passed by the Tramways Committee bearing testimony to his eminent services. He also received a handsome grandfather chiming clock.

Wage Reductions in England

Nearly all sections of British railway employees recently submitted to a reduction of 2½ per cent in wages and salaries, in view of depressed traffic. An exception was the case of the staff in railway generating stations and substations and those engaged on high-tension cable work. The railway companies applied to the industrial court to sanction a corresponding reduction in such cases, and the court has decided that the reduction shall be made.

Proposed Tramway Line in Java

Plans are now under consideration by the West-Java Tramway Syndicate to connect the isolated region lying to the east of the railway, Meester-Cornelis-Buitenzorg, by means of a tramway which would give direct connection with Batavia, Buitenzorg and Krawang.

TRAFFIC DEVELOPMENTS IN ITALY.—The Italian government has decided to electrify the most important railways serving the port of Trieste, with a view to development of traffic. These lines are the Trieste-Campo Marzio-Opicina, the Trieste-Aurisina Opicina, and the Trieste-Centrale Monfalcome.

SUBWAY PLANNED FOR MOSCOW.—Decision has been made by the Soviet to begin construction on Moscow's first subway. The cost is estimated at £2,000,000 and it is expected that the work will be completed in three years with the aid of German and American firms.

RADIO INTERFERENCE IN SWITZERLAND.—Some of the street cars in Berne were equipped recently with a special device to alleviate present interference with radio reception. If these tests prove satisfactory, all cars will eventually be equipped in this way.

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Recent Bus Developments

Substitution in Poughkeepsie Defined

The Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., under a Dec. 3 order of the Public Service Commission, has been authorized to operate buses in place of cars on its tracks on Market Street, South Avenue and South Road in Poughkeepsie to the city line, in Montgomery Street, in Hooker Avenue and in Southeast Avenue.

Approval was also given by the commission for discontinuance of trolley operation between Poughkeepsie and Wappingers Falls. The railway, under an agreement with the board of supervisors, is to sell to Dutchess County for state highway purposes all its rights to the use of land now occupied by its tracks between Poughkeepsie and Wappingers Falls for $150,000.

Seeks to Discontinue Line in Los Angeles

Application of the Pacific Electric Railway, Los Angeles, Cal., to discontinue its bus service on what is known as the Hyperion Avenue, Silver Lake, Glendale Boulevard Motor Coach Line has been taken under advisement by the Board of Public Utilities. A protest has been filed with the board against discontinuance of the service.

The company sought to discontinue the service May 12, 1926, setting forth that although $5,000 was paid as a subsidy during the first year, it was operated at a loss. People in the district agreed to subsidize the line for two more years. The service was continued over a slightly different route.

J. O. Marsh, general manager of the utilities department, said it was hoped that the district would have filled up so that the patronage would justify further operation of the line without further bonus. The Pacific Electric Railway contends that the line continues to operate at a loss, even with the bonus.

Buses Succeed Trolleys in Glens Falls

The Hudson Valley Railway lines radiating out of Glens Falls, N. Y., were abandoned on Dec. 1 and were replaced by 24 buses operated by the Hudson Transportation Company. Substitution by bus terminates railway operation which began 38 years ago.

Abandonment of the trolley service leaves about 50 miles of railway to be scrapped, between Glens Falls and Saratoga, in Glens Falls, between Troy, Mechanicville and Stillwater, Lake George and Glens Falls, and Glens Falls through Hudson Falls to Fort Edward.

The successor company will retain about 40 of the 125 employees of the Hudson Valley, a subsidiary of the Delaware & Hudson Company. Several men, in the employ of the railway company for more than 25 years, will retire, while others may be employed by the transportation company later.

Two-Mile Route in Buffalo Up to Commission

The Buffalo City Council has granted a one-year franchise to the International Bus Corporation, a subsidiary of the International Railway, Buffalo, N. Y., to operate buses in Kensington Avenue from Bailey Avenue to the city line, a distance of almost 2 miles. A 10-cent fare will be charged and the company is required to issue free transfers to other bus and car lines. The route, on which the company will operate single-deck, gas-electric buses, serves a new residential development in the northeast section of the city. The new service will start as soon as the necessary authority is obtained from the Public Service Commission.

Move to Put Louisville Taxis Under Regulation

The taxicab situation in Louisville, Ky., has not changed in the past two months, other than an ordinance which has passed the lower board of the City Council placing cabs under regulation. It provides for insurance or bond in acceptable concerns, with the $5,000 for one, or $10,000 for two persons hurt in an accident; for carrying on under a $30,000 blanket bond; maximum fare rates of 30 cents for the first quarter of a mile, as against the present 25 cents for two miles or under. The ordinance also provides for meters on all cabs, issuance of receipts and that drivers will have to pass examinations and receive permits from the Board of Safety before they can take out a cab. The latter provisions would block the migration of outside cabs and drivers to the city of Louisville to capitalize on the crowds at the race meets.

There are now about six concerns in the taxi business with two or more cars. One company is now operating Whippet cabs at 8⅓ cents per mile, or 3 miles for 25 cents, but more than 3 miles puts the rate up to 10 cents a mile for additional mileage. Most of the others are operating at 2 miles for 25 cents, or 12½ cents a mile.

The Louisville Taxicab & Transfer Company increased its number of cabs from about 75 in active service and 150 in all, to more than 250 in active service, plus a reserve supply, and all at 12½ cents a mile, having met the price.

Action on Buses in Kansas City Will Wait Fare Outcome

The Kansas City Public Service Company, Kansas City, Mo., will not ask for a renewal of its bus franchise. Its action on buses will depend on the outcome of the request, before the City Council at this time in which a 10-cent fare is suggested. In the recommendation to the Council, the company promises continuation of the bus service if the new fare is put into effect. Officials plan to ask for a day-to-day agreement with the Council to operate the buses until the increased fare question is settled. The trial agreement with the buses expired on Dec. 1.

In the report presented recently to the City Council by the company, there is little reference to the buses except to say that they are losing money. It stated, however, that if the 10-cent fare is accepted, the bus service will continue.

According to President Groner, bus service is still in the experimental stage and no long-term contract will be made by the company. The situation is further complicated by the fact that much of the equipment will probably have to be replaced within the next year. This applies particularly to the double-deck buses and the heavy coaches which were bought to run on a de luxe route at a 25-cent fare. The company says that the double-deck buses will not be replaced as they have not proved satisfactory.

Although the company reduced the bus fare from 15 cents straight to two fares for 25 cents, the buses are still losing money. They are losing less money than they did at the 15-cent fare, but more than at 10 cents, and under the 10-cent fare they lost money constantly.

Service by Bus Between Jackson and Kalamazoo

United States District Judge Charles C. Simons has authorized John F. Collins, receiver of the Michigan Electric Railway, to discontinue interurban service on its southern division, Jackson to Kalamazoo. Loss of more than $10,000 on this line from June 19 to Oct. 31 was cited as the basis for the order. Freight service will be continued, and buses will take care of passengers.

Syracuse Fare Agitated

Tentative plans have been laid to raise the bus fare in Syracuse, N. Y., to 10 cents cash with six tickets for 45 cents, corresponding with the rate of the New York State Railways on trolleys. The program also provides for issuance of a five-year permit for bus operation to the Syracuse Coordinated Railways Corporation, subsidiary of the New York State Railways. In return for the five-year permit and the higher fare, the bus corporation and railway agreed to ex-

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tend the bus lines and make other improvements.

The program has been tentatively approved by the aldermanic franchise committee and representatives of the bus and railways as a compromise. The bus company had asked for a franchise for its bus lines. In the past it has been operating under a permit which had to be renewed by the aldermanic body annually. The aldermen as a whole were opposed to the franchise proposition. Railway officials said they would extend the bus lines only on condition that they receive a franchise or long-term permit, which would serve to protect their investment. They contended that it was inconsistent to have the buses operate at a 7-cent fare and the trolleys at a 7½-cent ticket or 10-cent cash fare, particularly in view of the fact that it was possible to transfer from one to the other.

Geneva-Waterloo-Seneca Falls Route Sought

The Geneva Railway Bus Lines, Inc., applied, on Dec. 4, to the Public Service Commission for a certificate for the operation of a bus line from Seneca and Linden Streets in Geneva, to Main Street in Waterloo town, thence to Seneca Falls. The petitioner also asks for a certificate to operate along Lake Street in Geneva and the continuing highway in Waterloo town to the junction with North Street. In the petition it is stated that the schedules of operation and fares, including round trip commuters and school tickets and transfer privileges, are to be the same as the existing operating schedules and fares of the Geneva, Seneca Falls & Auburn Railroad Company, Inc. The bus line has been operating in Geneva, N. Y., since 1925.

Equalizes Rail and Bus Fares in Binghamton

An amended tariff of the Binghamton Railway Bus Lines, Inc., has been approved by the Public Service Commission in accordance with an ordinance adopted by the Common Council of Binghamton, N. Y. It authorizes the Binghamton Bus Lines, Inc., to charge the same fare for transportation over its lines within the city of Binghamton as is charged by the Binghamton Railway over its car lines within said city, with universal transfer privileges between buses and street cars. Cash fare is 10 cents with four tickets or tokens sold for 30 cents. The new tariff is effective on Dec. 20, 1928.

East St. Louis Petition Denied

The application of the East St. Louis & Suburban Railway to substitute buses for street cars between Edgemont and Lebanon, Ill., was dismissed by the Illinois Commerce Commission on Nov. 27.

Financial *and* Corporate

North American Company Centralizes St. Louis Operation

The Missouri Public Service Commission on Nov. 28 granted the application of the Union Electric Light & Power Company, St. Louis, for authority to acquire by purchase from its parent, the North American Company, the stock of all the public utilities in the East St. Louis and Alton districts controlled by that company. A total of $18,100,000 is involved in the sale, which simply means that the North American Company is centralizing the operation of all its utilities in the Greater St. Louis district in the Union Electric Company.

The Union Electric Company will pay the North American Company $8,000,000 in cash and $10,100,000 of its common stock. It was stated in the application and testified to at the hearing that the Union Electric is simply paying the North American Company just what it cost that concern to acquire these utilities.

Corporations affected are the East St. Louis Light & Power Company, East St. Louis Railway, Alton & St. Louis Railway, Alton Gas Company, the Alton Railway and the Union Electric Light & Power Company of Illinois, which operates the Cahokia power plant south of East St. Louis.

Revenue and Traffic Fall Off in Philadelphia

For the nine months ended Sept. 30, 1928, the deficit of the Philadelphia Rapid Transit System, Philadelphia, Pa., was $409,832, for the three months' period ended Sept. 30, 1928, $440,421, and in September, 1928, the deficit was $411,294.

The company in its report states that this deficit represents largely the added expense to P.R.T. system from operation of Broad Street subway. September was the first of three months during which P.R.T. agreed to operate the subway for the city. Terms generous to the city were agreed upon because the management recognized that in no other way could the true financial effect of this city-built subway be shown so as to be accepted and understood by everybody. This understanding has now been secured, the cost will be met out of P.R.T. surplus without affecting dividends, and the city has been notified that a new agreement must be provided for after Nov. 30.

Investigation Planned of Grays Harbor Holdings

Legal proceedings leading to the acquisition by the city of Aberdeen, Wash., of the Grays Harbor Railway, Light & Power Company have been authorized in a communication from the City Council. This grants Mayor H. E. Bailey the power to employ special counsel and to proceed with the necessary steps to procure the facilities. Whether the property will be acquired through purchase without condemnation was not known today. The Mayor said that it was planned by the city to conduct a complete survey of the holdings of the company, as soon as a definite price was placed on it by company officials.

Approval Sought for Declaration of Abandonment

The International Railway, Buffalo, N. Y., has applied to the Public Service Commission at Albany for approval of a declaration of abandonment of its double track line in Carolina Street, starting from Niagara Street, alleging that this part of its system is no longer necessary for the successful operation of its lines and has been non-operative for more than five years. Further, the company states the lines using the portion of the route have been rerouted for more than five years past to give more direct and efficient service in the district.

Puget Sound Sale Postponed

Fixing of the time and place of the sale of the property of the Puget Sound Electric Railway, Tacoma, Wash., used in its operation of the Seattle-Tacoma interurban line, has been delayed for two weeks. Date of sale was to have been set in Federal Judge Cushman's Court on Nov. 25, but he continued the hearing until after Dec. 10, upon request of the receiver's attorney.

PASSENGER STATISTICS FOLLOW:

	Nine Months Ended Sept. 30, 1928			Nine Months Ended Sept. 30, 1927		
	Passenger Revenue	Passengers Carried	Average Rate per Passenger, Cents	Passenger Revenue	Passengers Carried	Average Rate per Passenger, Cents
Surface, subway and elevated	$33,666,145	648,275,077	5.19	$35,128,281	670,097,096	5.24
Bus	2,615,433	26,829,001	9.75	2,197,176	23,922,042	9.18
	$36,281,579	675,104,078	5.37	$37,325,457	694,019,138	5.38
Taxi	4,066,620			4,156,574		
Total	$40,348,199			$41,482,031		

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Records in Rides and Receipts Registered in Chicago

Street car riding in Chicago, which has shown a remarkable growth throughout the year, reached the highest peak in the history of the city last month, according to the October report of the Chicago Surface Lines, just issued. Both in total rides and in gross receipts the company set a new record.

The total number of rides during the month was 142,063,299, an increase of 2,884,207 over the previous highest month—last March. The gross receipts were $5,406,144, an increase of $58,915 over the previous high of December, 1926. Guy A. Richardson, vice-president, said:

We are timing overhauling schedules in such a way as to have every car available during rush-hour periods throughout the heaviest part of the Christmas shopping season.

Company officials declare that there has been no unusual condition this year to account for the tremendous increase in riding, and they credit the growing business almost entirely to the greater popularity of street car service. In this connection Mr. Richardson said:

People are learning more and more that the common carrier has a distinct advantage over the private automobile for city transportation. Surface Lines cars make almost as good time as automobiles in congested sections, and when the time consumed in parking the automobile is taken into consideration, the street car is faster. So far as economy is concerned, of course, there is no comparison. Short-haul riding has been increasing rapidly of late also, due to the increased regularity of cars through the Loop and other congested sections.

Preferred Stock of Interurban Publicly Offered

Public offering of $1,500,000 of 6½ per cent cumulative Class A preferred stock of the Chicago, South Shore & South Bend Railroad was made on Dec. 1, at $96.50 a share. This is the first stock of the railroad ever offered to the public. It will be sold by employees of the railroad and by the Utility Securities Company, Chicago.

The road is more generally known as the South Shore Line. It is controlled by the Midland Utilities Company, which also controls a number of other utility companies in northern Indiana. The railroad came under the present management on July 14, 1925. Since that time an extensive rehabilitation program has been carried on and service improved.

Under the new management there has been a steady increase in business. Passengers carried on the main line increased from 1,552,308 in 1925 to 2,806,855 for the year ended Sept. 30, 1928, an increase of 80.8 per cent. Passenger revenue rose from $599,236 in 1925 to $1,772,918 for the year ended Sept. 30, 1928, an increase of 195.9 per cent. Freight revenue rose in the same period from $189,263 to $1,129,856, an increase of 497 per cent. Total operating revenue in the same period increased from $858,265 to $2,972,888, or 246.4 per cent.

Sale of Spartanburg Property Arranged

All the property of the South Carolina Gas & Electric Company will be sold at the Spartanburg County Court House on Dec. 10, under an order by Judge H. H. Watkins of the United States Court of the Western District of that state. The order also named an upset price of $4,200,000. Action which terminated in this order grew out of a suit brought last June and the federal judge upholds a report of the case made by Solicitor J. C. Blackwood, of the Seventh Judicial District, who was appointed special master.

According to the order, the purchaser will "satisfy and discharge any unpaid indebtedness and obligations or liabilities which have been duly contracted or incurred by the company for the necessary operating expenses in due and ordinary course of the said company subsequent to the commencement of this suit."

The South Carolina Gas & Electric Company defaulted on payment of interest on bonds and action followed. The Merchants & Farmers Bank, as trustee for their bondholders, brought action in the United States courts against the gas company to foreclose third mortgages. The New York Trust Company, as trustee for first bondholders, and the American Exchange Irving Trust Company, as trustee for second mortgage bondholders, were made parties to the action and asked that their mortgages be foreclosed in the same proceedings.

Mr. Blackwood was appointed special master to take testimony and determine all points of law and fact, and to pass on all claims against the company and report his findings to the court. He filed a report and recommended the foreclosure of all mortgages and the sale of the property of the company. As said above, this report by the master was upheld by the court.

Traffic, Fare and Wage Figures

The number of revenue passengers, including bus passengers, reported by 228 companies to the American Electric Railway Association for the month of October, 1928, compared with October, 1927, is as follows:

October, 1928	839,377,637
October, 1927	833,954,392
Increase, per cent	0.65

This is the first month that has shown an increase in traffic since March, 1927, with the exception of February, 1928, when the increase was due to the extra day occurring in Leap Year. While this increase is encouraging it is too soon to say that it is due to any fundamental improvement in traffic conditions, since there were two more full working days in October, 1928, than there were in October, 1927, and it is quite possible that this difference in the calendar may have accounted for the increased traffic in 1928.

Average cash fare in cities of 25,000 population and over:

	Cents
Nov. 1, 1928	8.2358
Oct. 1, 1928	8.2241
Nov. 1, 1927	8.0723

The increase in the average fare between Oct. 1 and Nov. 1 was due to an increase in Los Angeles from 5 cents straight to 7 cents with four tokens for 25 cents and an increase in Shreveport, La., from 7 cents straight to 8 cents with eight tickets for 60 cents.

The correction in the average for Oct. 1, 1928, and that shown in last month's service letter is due to the fact that street railway service in Marion, Ohio, with a population of about 28,000, has been discontinued and the city therefore has had to be taken out of the average.

	Average Hourly Rate, Cents	Index Number 1913=100 Per Cent
Nov. 1, 1928	57.52	211.08
Oct. 1, 1928	57.52	211.08
Nov. 1, 1927	57.29	210.24

New Director in Boston

Bernard J. Rothwell, president of the Bay State Milling Company, has been elected a director of the Boston Elevated Railway, Boston, Mass. Mr. Rothwell's appointment comes as the result of the directors' decision to increase their number by one. Mr. Rothwell was president of the Boston Chamber of Commerce from 1908 to 1910, and in 1913 served as chairman of the Massachusetts Commission on Immigration. He is prominently connected with many enterprises.

David F. Houston Elected to Brooklyn Board

David F. Houston, former Secretary of Agriculture and of the Treasury and now president of the Mutual Life Insurance Company, New York, has been elected a director and member of the executive committee of the Brooklyn City Railroad, Brooklyn, N. Y., to succeed the late James Simpson.

Bringing the Force Together in Baltimore

The United Railways & Electric Company, Baltimore, has leased six entire floors in the new Court Square Building and will move its offices from the Continental Building about March 1. At the present time the offices of the Baltimore company are scattered over a number of floors of the Continental Building, some on every floor from the eighth to the fifteenth. In addition to these the company uses one complete floor.

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Book Reviews

Stay Alive!

Marcus Dow. Published by Marcus Dow, Inc., New York, 209 pages. Price $2.

Kicks enough to go around for all walking and riding humanity are contained in Marcus Dow's message "Stay Alive!" Through his spokesman, Jim the truckman, observant and experienced, many harrowing tales are recounted with such vividness and conviction that the reader can't help but agree with this burly recorder that the question of accidents is all a matter "of usin' the noodle." To prove his contentions Jim recites one instance after another—backing without looking behind, rushing past intersections and piloting with one arm—where results might very evidently have been different.

The three or four line admonitions at the end of each chapter epitomize the substance of the kick in that particular chapter. Corner Cutters, for instance (Kick No. 20), points this moral: "Turnin' a corner faster than anybody can walk in givin' them that walks a kind of a tough break." Another, called Black Cats, suitably listed as Kick No. 13, ends thus: "Don't try to hug the car in front o' you. Wait till you get home and hug your wife."

Nor is Jim biased in favor of the pedestrian. He often finds the walking human a more perverse goat-getter. In language that certainly is not euphemistic he scores the jay-walker who steps unwittingly, of course, in front of a touring car, taxi or truck and the fellow who for a capricious reason decides to cross the avenue green lights or otherwise. Besides, Jim believes that this hurry business is an illusion.

Again, Jim claims many drivin' fools really think "they is good engineers," but he knows better. For he had a career shunting box cars in the main yard of a terminal on one of the big transportation lines of the country and there he learned his lesson on the how, why and wherefore of care and safety.

Mr. Dow, the author, is one of the leaders of safety in this country with activities in the field of public service that cover fifteen years and embrace the writing of valuable pamphlets, making public addresses and moving pictures and otherwise giving his time and energy to the business of saving life.

Jim's cracks on the shortcomings of "drivin' fools and walkin' yaps" and the drawings of H. S. Zoll might be examined with profit by all drivers.

Law and Practice

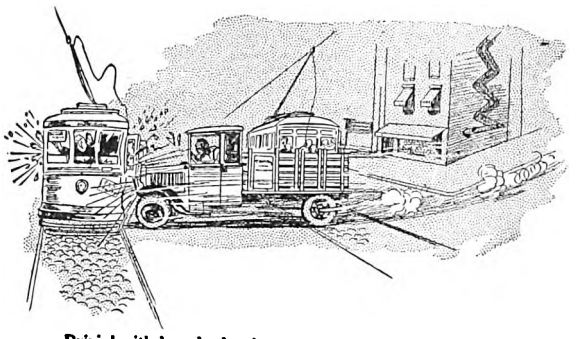
Oscar A. Gier. Published by Richards & Gier, patent attorneys, New York. No charge.

This is a summary of United States patent law, relating to the prospective patentees, what may be patented, methods of applying for a patent, procedure in the patent office and infringement suits. The appendix gives the rates charged for foreign patents, term of patent and other similar information.

Public Utility Rate Making

Taylor E. Groninger, Bobbs-Merrill Company, Indianapolis. 381 pages. Price $7.50.

The author was formerly corporation counsel for the city of Indianapolis and special counsel for the Indiana Public Service Commission. He was also one of the attorneys in the Indianapolis Water Case, before the Public Service Commission of Indiana, before the United States District Court, and finally, before the United States Supreme Court, where he made one of the oral arguments. This experience qualifies him for a discussion of the subject. In his introduction he says frankly that though he would prefer that the rate base should be measured by "prudent investments," he discusses all the methods approved by the courts. Besides treating the points usually considered in volumes on this subject, the author adds several appendices, giving many details of recent cases, revised rules of the Supreme Court of the United States and other pertinent matters.



Drivin' with bum brakes is a cruel crime against humanity.

Mundy's Earning Power of Railroads

Compiled and edited by Floyd W. Mundy, James H. Oliphant & Company, New York, N. Y.

In this 23rd issue are found important statistics and other facts relating to the earning power and to the securities of railroads, arranged in convenient form for ready reference. Such subjects as stocks, funded debt, mileage, revenues, rentals, guarantees, investments, valuations and others are covered so that the investor can inform himself on the value of the stocks and bonds of any important railroad in the United Sates. Official annual railroad reports have been used almost exclusively in the preparation of this book.

Whither Mankind

Edited by Charles A. Beard—Longmans, Green & Company, New York, N. Y. 408 pages, Price $3.

Not so much to defend the machine age as to urge an impartial and dispassionate view of its accomplishments and possible future, "Whither Mankind"—a panorama of modern civilization—will give the inquiring mind some pertinent facts on life as it is lived today. Dr. Beard and his collaborators have dissected and analyzed the machine age and have tried to answer its assailers and critics on the esthetic, religious and humanitarian sides.

Certain contributions to this symposium are not connected with electric railway enterprises. However, the discussion on business by Julius Klein, director of the U. S. Bureau of Foreign and Domestic Commerce, is not too far afield to win the attention of the progressive transportation man. To Dr. Klein it would appear that after passing through its successive stages, "machinery and its directive force, modern business," have made an impressive contribution in "easing the burdens of drudgery, in sharing the costs of countless tasks, and in making available a larger leisure for the enjoyment of those finer comforts which in earlier ages were the exclusive prerogatives of a few." He sees business, too, with a grave responsibility in the drama of restoring order out of post-war chaos.

A particularly provocative chapter on education has been written by Everett Dean Martin, containing generous excerpts from his "The Meaning of a Liberal Education." Just as the latter work is worth the time of every railway manager and operator, now vitally interested in the problem of educating the rank and file, so, too, might this addenda be read with profit by all in and out of the railway field who are floundering about in an effort to know and apply the aim of education to modern conditions.

The New Way to Net Profits

Fred W. Shibley, New York. Harper & Brothers. 206 pages. Price, $3.

This book on the science of business is a practical treatise dealing with the making of net profits in business and industry. The appeal of the book's contents should be a wide one. Manufacturers, merchants and bankers will find information of great value in the solution of their special problems.

The opening chapter on "Why the New Way Was Found Necessary," establishes the fact that the present is the day of the thinker, the philosopher in industry. Modern business has become highly complex and must be conducted on scientific principles. In consequence the business man today must possess the intellectual qualifications and the practical wisdom of a philosopher if he expects to attain pre-eminence.

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Personal Items

George B. Avery Takes Over the Reins in Seattle

The appointment of George B. Avery as superintendent of public utilities of Seattle, Wash., by Mayor Frank Edwards, on Aug. 15, last, was followed on Nov. 13, by the City Council passing an ordinance giving Mr. Avery full charge of the Seattle Municipal Street Railway department and abolishing the position of general superintendent, held by David W. Henderson, who died on Oct. 27. Mr. Avery, as superintendent of public utilities, succeeds Clark B. Jackson. In line with his expressed policy of operating the system as a corporation would operate it, he has appointed the following heads of departments for the railway:

George B. Avery

Roy E. Furse, superintendent of transportation; R. E. Pierce, superintendent of maintenance; A. D. Campbell, superintendent of equipment and A. C. Hiatt, accountant.

Prior to his appointment, Mr. Avery was employed by the State Department of Labor and Industries at Olympia, having charge of six counties, including King County, the largest of the 39 comprising the state. He also has been identified with the Internal Revenue Department, operating in Seattle and for about eight years served the government as an electrical engineer, supervising electrical installations in hospital construction programs in South Dakota and elsewhere.

Mr. Avery was born in Chariton, Lucas County, Iowa, on March 19, 1884. He went to Seattle in 1916 and has been active in civic affairs.

Mr. Avery signalized his advent into full power over the municipal railway by launching energetic steps on his program, which promises improvement in service as well as heavy reduction in operating costs. He declared that hereafter "efficiency, service, economy and courtesy" would be the rule of the railway department.

As the first step in this program, Mr. Avery plans to speed up service in the congested downtown district during the afternoon "peak" traffic rush. To this end, police department has started strict enforcement of a ban on parking of automobiles. Further, to expedite movement of cars in the downtown district, fares will be collected at both front and rear doors, that loading may be more quickly accomplished.

After Jan. 1, the feeder buses will be retained and one-man cars will be operated on all lines, except that two-man cars will be in service on certain of the more heavily traveled lines during the late afternoon rush period. Carrying out instructions, Roy E. Furse, superintendent of transportation, has issued a bulletin to the 1,100 train men on two-man cars warning them of the impending change to a one-man car basis, and advising them to familiarize themselves with the one-man car operation before Dec. 15. After that date, selection based on efficiency will be made of the 1,000 who are to be retained as one-man car operators.

M. R. Beaman Honored in Philadelphia

Maurice Regan Beaman has been appointed secretary of the Bureau of Transportation and Commerce, recently established by the Philadelphia Chamber of Commerce. For more than a year the holder of this new post has been general manager of the Camden Marine Terminals and traffic manager of the South Jersey Port Commission. He has spent more than a score of years in handling transportation problems, half of the time in the service of the carriers and the rest either with the shippers or in port executive positions in various cities.

For twelve years until 1915 Mr. Beaman was with the traffic department of the Southern Railway. He developed into a rate expert, appearing frequently before the Interstate Commerce Commission. In Camden he organized the Traffic Club and reorganized and headed without compensation the traffic committee of the Camden Chamber of Commerce.

Mr. Beaman was born in Raleigh, N. C., 41 years ago. He was graduated from the old Columbia Law School in Washington. In his new post he will combine into one bureau the work formerly handled by the transportation bureau and the foreign trade bureau of the chamber. P. H. Gadsden, president of the chamber and a former president of the American Electric Railway Association, in announcing it said that Mr. Beaman's appointment was the first of a number of important developments intended to increase the militancy of the Chamber of Commerce.

Additional Duties for D. W. Dodge of Brill

Douglas W. Dodge, who has represented the automotive car division of the J. G. Brill Company since 1923, has also been appointed Pacific Coast representative of its electric car and truck division. Therefore, in addition to self-propelled gas-rail and gas-electric cars for steam railroads, Mr. Dodge will also handle the sale of electric cars, trucks, seats, specialties and renewal parts in the states of Washington, Oregon, California, Idaho, Utah, Arizona, Montana, Wyoming and Nevada. His office will continue to be in the Rialto Building, San Francisco.

A broad engineering experience was acquired by Mr. Dodge with the Ocean Shore and the Western Pacific Railroads, as well as the Pacific Portland Cement Company. From 1907 to 1917 he was engaged in sales work for the Orenstein Arthur Koppel Company. Then for two years he served in the Engineers Corps, U. S. Army.

D. W. Dodge

Subsequently, he was Pacific Coast manager of the Lakewood Engineering Company and manager of the Engineering Products Company, representing the latter until his recent appointment.

Mr. Dodge, who has always lived on the Pacific Coast, is a member of the Engineers, Transportation and Commercial clubs and of the Menlo Country Club.

Messrs. Kidd and Murrin in New Rôles

George Kidd has resigned as president of the British Columbia Electric Railway, Vancouver, B. C., and has accepted the chairmanship of the board of directors of the British Columbia Power Corporation, the holding company. W. G. Murrin, vice-president, will take over the office of chief executive.

Mr. Kidd thus completes a period of fifteen years as head of the British Columbia utility. He was educated as a chartered accountant and was ap-

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pointed (London, England) secretary of the British Columbia Electric Railway in 1907. Four years later he went to British Columbia and acted as comptroller until May, 1914, when he was appointed general manager. The office of general manager was changed to that of president in August, 1923.

Mr. Murrin began his public utility career in the City of London Electric Lighting Company in 1903. Later he became works manager and electrical engineer of the London United Tramways, which concern he left in 1913, going to British Columbia as mechanical superintendent of his present company. From general superintendent he became assistant general manager in November, 1916, and was appointed vice-president in August, 1923. The president-elect, as is his predecessor, is well-known in social circles in Vancouver.

G. W. Schwaner Succeeds R. V. Prather

George W. Schwaner, former Sangamon County treasurer and at one time internal revenue collector, has been appointed secretary of the three Illinois state utility associations, succeeding the late R. V. Prather of Springfield, Ill. This selection was made by executive committees of the three organizations: the Illinois Electric Association, Illinois Gas Association and Illinois Street Railways Association. His office will be in Springfield.

C. F. Terrell Succeeds E. S. Fitz at Beaumont

E. S. Fitz, operating manager of the Eastern Texas Electric Company, Beaumont, Tex., since December, 1924, has accepted a position with the Virginia Electric & Power Company with office in Richmond, Va. His business connection with Stone & Webster began in 1911 with his employment in the meter department of the Blackstone Gas & Electric Company, Pawtucket, R. I. He has served with the Houghton Electric Light Company and the Houghton County Traction Company. Mr. Fitz was graduated from Brown University, Providence, R. I., as an electrical engineer. Except for the period when he was in the Army Air service overseas, he has been connected with Stone & Webster since 1911.

Mr. Fitz's successor, Charles F. Terrell, has already assumed his new duties as operating manager of the properties. He was formerly general superintendent of the light and power department of the Tampa Electric Company. Beginning work with the Stone & Webster interests in Seattle and later being affiliated with the properties in Bellingham and El Paso, his record of twenty-five years service with the organization is one of steady promotion. Mr. Terrell was born in Illinois in 1885, and he was graduated from the University of Washington as an electrical engineer in 1910.

A. W. Thompson Away on Leave from U.G.I.

Granting of a six-month leave of absence was voted on Dec. 5 by the United Gas Improvement to its president, Arthur W. Thompson, for reasons of health, and John E. Zimmermann, president of Day & Zimmermann, engineers, received full executive powers temporarily. In the light of the action of Dec. 5 the reason for the addition of five members to the executive committee last month with its implication of a pending consolidation, was said to be clearer. Several New York and New Jersey men were added to the committee.

The new members named were Thomas N. McCarter, president of the Public Service Corporation of New Jersey; William C. Dickerman, operating vice-president of the American Car & Foundry Company; Landon K. Thorne, president of Bonbright & Company, Inc.; Harold Stanley, a member of J. P. Morgan & Company, and Mr. Zimmermann.

The official statement of the change said that Mr. Zimmermann had agreed to accept such a temporary assignment of duty, upon condition that he is not committing himself, nor is the company committing itself by reason of such appointment, to any permanent use of his services as an executive officer, he being unwilling to accept any such obligation.

Mr. Thompson has had a varied and conspicuously successful career in railroad and public utilities fields. He has been president of the United Gas Improvement Company since 1922 and for seven years previously was president of the Philadelphia Company, Pittsburgh. To accept that post he resigned as vice-president of the Baltimore & Ohio Railroad in charge of operations, traffic, engineering and commercial development. He was born in Erie, Pa., in 1875, is a graduate of Allegheny College, and is now president of its Board of Trustees. He is a director of many companies, among them the Pennsylvania Railroad, Missouri-Kansas-Texas Railroad, Philadelphia National Bank, Pittsburgh Hotels Company, Public Service Corporation of New Jersey, Union Trust Company of Pittsburgh, The Pennsylvania Company and the P. C. C. & St. L. Railroad, and is a manager of the Girard Trust Company, Philadelphia.

C. B. Melton, assistant treasurer of the Eastern Texas Electric Company, Beaumont, Tex., has resigned. He has gone to Greensboro, N. C., to take charge of the accounting work connected with the extensive ice properties of the Southern Public Service Company in Virginia, South Carolina and Georgia. He has been a member of the Stone & Webster organization for about a dozen years, serving in Pensacola, Houston and Beaumont.

J. R. Groves has resigned as general manager of the Barrow, England, Tramways on account of ill health. He has had a wide tramway experience during the past 40 years, holding important positions in Edinburg, Cardiff, Yarmouth, Peterborough, Worcester, Gravesend and Barrow. The Barrow Town Council has granted Mr. Groves a pension.

R. B. Stearns Retires

Robert B. Stearns, vice-president, general manager and treasurer of the Eastern Massachusetts Street Railway, Boston, Mass., who for more than eleven years has been the chief executive officer of the road, has resigned to take effect Jan. 15, 1929. He will continue as a director of the company. The effective date of his resignation coincides with the date of expiration of the ten-year public trusteeship.

OBITUARY

One of the leading figures of the South, a banker and public utilities projector—E. W. Robertson—died in New York on Nov. 21, after coming to the city to attend a meeting of the directors of the Equitable Life Assurance Society. The former chairman of the board of directors and treasurer of the Columbia Railway, Gas & Electric Company, Columbia, S. C., and the Parr Shoals Power Company and president of the Columbia Gas Light Company severed his connection with these utility enterprises in 1924 at the age of 61. He had obtained control of the Columbia Electric Street Railway, Light & Power Company in 1903 and the name was subsequently changed to the Columbia Railway, Gas & Electric Company. Mr. Robertson was graduated from Yale University and from the law department of the University of South Carolina in 1887. He has been an outstanding figure in banking in the South.

Frederick Kent Copeland, president of the Sullivan Machinery Company since 1892, died at Claremont, N. H., on Nov. 10. After several years spent in Iowa and Colorado in mining engineering work he helped to organize the Diamond Prospecting Company in 1884 and became its president. This company engaged in contracting with the Diamond Core Drills made at Claremont, N. H., by the Sullivan Machine Company. In 1892 the two companies were merged with Mr. Copeland as president. Under his leadership Sullivan products were developed for a wide range of purposes serving the mining, quarrying, constructing and manufacturing industries, being manufactured at plants at Claremont, N. H., and Michigan City, Ind., and marketed through world-wide sales organization. Mr. Copeland was born in Lexington, Mass. He was graduated from Massachusetts Institute of Technology in 1876 and was a member of many engineering societies.

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Additional Improvements Projected

Pacific Electric may make extensive track changes. Chicago Rapid Transit to improve Westchester line. Tacoma to ask for bids on cars. Seattle and Milwaukee plan improvements

PERHAPS the outstanding plan among the numerous improvement projects announced this week is that of lowering the tracks of the Pacific Electric Railway, Los Angeles, Cal., that bisect the entire city of Beverly Hills. These tracks, which are at a considerable elevation, will be reduced to street level and many of the wig-wag bell signals will be disposed of, if the Chamber of Commerce and the City Council succeed in an engineering survey that will present an equitable bond issue for the approval of the voters. The railway at its present elevation rises from the surrounding level at the eastern end of Beverly Hills and returns to this level a little beyond the junction of Wilshire and Santa Monica Boulevard, thus making Santa Monica Boulevard an imaginary barrier between the northern and southern sections of the city.

Chicago Improvements

The Chicago Rapid Transit Company, Chicago, Ill., will make extensive improvements at the present terminus of the Westchester line in connection with the widening and paving of Roosevelt Road. To eliminate the danger of a grade crossing the plans provide for the raising of the highway to a height of 8½ ft. above the present grade and the depression of the tracks of the Westchester line to a depth of 14 ft. The depression of the tracks will be below the sewer level at the lowest point, which will necessitate the installation of a pumping station.

The open cut for the tracks will be 2,300 ft. in length, and a total of 3,800 cu.yd. of dirt will have to be excavated. The present station will be moved south and east and an island platform built in the open cut between the tracks. The work will be done simultaneously with the widening of Roosevelt Road so that the dirt can be taken out of the cut and used for raising the level of the highway across the viaduct.

To Ask Bids on Cars

The plan for purchasing seven new street cars for the Tacoma Municipal Railway, Tacoma, Wash., has been changed. Instead of buying the cars from an Eastern concern direct, the board of contracts and awards will issue a call for bids for this equipment. The date for calling these bids has not been set. This equipment will be used in place of rented cars, which have been in service since the fire last June that destroyed the carhouse and the rolling stock. The plan for financing this new rolling stock and a new carhouse by a $140,000 utility bond issue was announced in the Aug. 25 issue of the JOURNAL.

The Seattle Municipal Railway has authorized the remodeling of 72 two-man cars to permit one-man operation. Plans for rehabilitating its line and restoring adequate service have been made. These plans involve refinancing, the purchasing of new rolling stock, the rebuilding of the existing system and the construction of needed extensions. The details have not been made public.

New Station for Milwaukee

A contemplated improvement costing more than $100,000 has been announced by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. It is planned to erect a sheltered loading station for interurban cars near the Broadway ticket station of the company at Waukesha, Wis. The plans provide for the widening of Broadway from 66 ft. to 102 ft., the erection of a sheltered station of concrete and steel foundation, glass inclosed, over the double tracks and a 22-ft. subway leading to both sides of the street so passengers will not have to cross in traffic. Paving the street and widening the bridge across the Fox River will also be included in the project, at the expense of the railway.

The orders for equipment have dropped considerably. The Washington Railway & Electric Company, Washington, D. C., has purchased during the past month 200 pairs of joint plates, section 114-480; 100 pairs of joint plates, section 104-396; 470 cast-iron manholes, frames and covers and 10,500 track bolts. This company also has purchased three Champion snow plows from the John T. Lewis Company, and among its shop equipment ordered is one Argyle Titan electric drill and one Feregen three-way wheel aligner. The Denver Tramway Corporation has placed orders for 100 30-ft. Western red cedar poles, 41 marathon trolley ears 12 in. long for No. 00 round trolley wire.

Rolling Stock Ordered

The Northwestern Pacific Railroad, San Francisco, Cal., has ordered five motor cars and five trail cars from the St. Louis Car Company. Mention of the inquiry for these cars was made in the Oct. 27 issue of the JOURNAL.

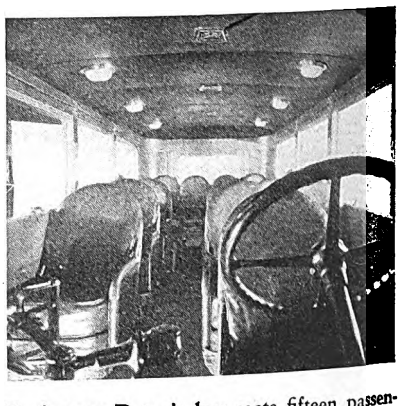
One interurban car valued at $12,500 was destroyed and a second interurban and four city cars were damaged in a fire in the carhouse of the Kentucky Traction & Terminal Company, Lexington, Ky. The damage to the second interurban car was estimated at $4,000. The damage to the four city cars will approach from $3,000 to $4,000.

The Detroit Street Railway, Detroit, Mich., has purchased fifteen urban-type Twin Coaches from the Twin Coach Corporation at Kent, Ohio. The United Electric Railways of Providence, R. I., has ordered eight suburban express Twin Coaches, and the Boston Elevated Railway, Boston, Mass., has purchased five gas-electric Twin Coaches. The Central Transportation Company, Trenten, N. J., controlled by the Trenton & Mercer County Traction Corporation, has purchased two suburban express Twin Coaches.

120 Buses for Detroit

Orders have been placed by the Detroit Department of Street Railways with the Dodge Brothers division of the Chrysler Corporation for 120 Graham Brothers parlor coaches.

Each coach seats fifteen passengers, exclusive of the driver, in individual deep leather, air cushion, wicker chairs on spring bases and is roomy and comfortable. There are four seats at the rear of the bus, one over each rear set of wheels, facing in, six arranged in pairs on the left and three single seats on the right. Ventilation facilities, including an electric fan opposite the door, and ventilators in cowl and roof insure a steady flow of fresh air. The heating is taken care of by the fan blower system, the air being brought in, heated and forced through the coach. A sloping one-piece windshield has V-type ventilating wings at each side as well.



Each new Detroit bus seats fifteen passengers, exclusive of the driver

Lockheed hydraulic four-wheel internal expanding brakes with a hand brake which operates on the propeller shaft, an emergency door at the rear

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of the coach, and a non-skid entrance step are included in the safety features. A suggestion of the Pullman car is given by the mirrors set in the window posts.

Six-cylinder motors with four-speed transmission provide the power, while the coach has the protection of the braking facilities in an automobile. Freedom from driving strain is assured by the nut-and-lever type steering gear, the varying ratio giving rapid action in turning and easy control on straight-away running.

The interiors are trimmed with leather and all windows are plate glass with roller anti-rattlers inside and out. Stops are signalled by a cord attached to a buzzer in place of the customary push button.

The bus is 20 ft. 6 in. long and 6 ft. 5 in. wide, equipped with four hydraulic shock absorbers and balloon tires with dual rear wheels. The oak flooring laid crosswise is covered with linoleum and 6 candlepower flush type dome lights furnish the illumination.

A distinctive color combination is used by the Street Railways Department, distinguishing the de luxe bus from others operated in Detroit. Around the base of the body is a skirt of black, then a wide strip of maroon topped by a red band set off by black and gold stripes and a beige top. The wheels are red, surmounted by black fenders.

Manitoba Line Nearing Completion

Construction on the railroad to Seven Sisters Falls—one of the shortest railways in Canada—will be completed early in December and will usher in a new period of hydro-electric development in Manitoba. It will also open up an important agricultural area and a realm for sportsmen.

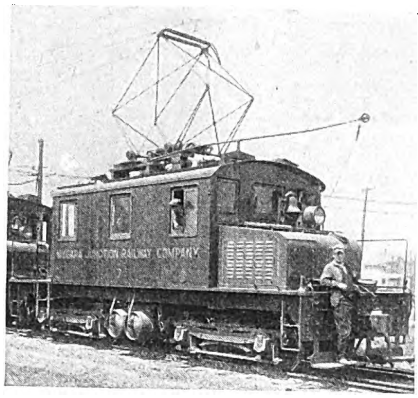
This railroad is being constructed by the Manitoba Eastern Railway, a subsidiary of the Winnipeg Electric Company. It commences at Whitemouth on the east main line of the Canadian Pacific Railway, 61 miles from Winnipeg and goes north approximately 14 miles to Seven Sisters Falls on the Winnipeg River, the site of the new power plant to be erected by the Northwestern Power Company, Limited. It will be a standard gauge modern railroad capable of handling heavy freight and passenger traffic.

The main purpose of the railway is to provide direct transportation facilities, via the Canadian Pacific Railway, from Winnipeg to the new Seven Sisters power plant, but it will also be a valuable asset to the surrounding district including a rich agricultural territory.

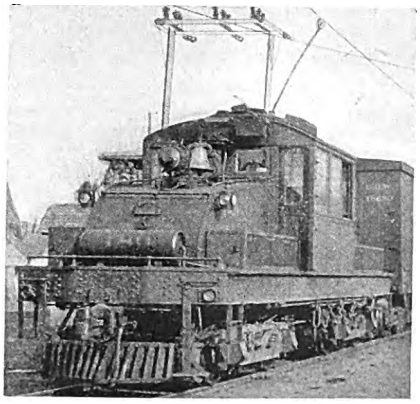
With the completion of the railroad, work will proceed rapidly on the Seven Sisters power plant. This plant will have an initial capacity of 135,000 hp. and an ultimate capacity of 230,000 hp. Construction of the plant will cost approximately $20,000,000 and provide employment for 1,500 or 2,000 men for two or three years.

Locomotives Purchased by Two Railways

A duplicate 60-ton locomotive has been purchased by the Niagara Junction Railway, Niagara Falls, N. Y., from the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. This locomotive will be equipped with four 308-D-5 motors and HL control and is the second locomotive of this type being used by this railroad. The Niagara Junction Railway handles practically all transfer traffic between the important chemical factories along the Niagara River and the steam lines.



The type of locomotive purchased by the Niagara Junction Railway is equipped with four 308-D-5 motors and HL control



A 50-ton locomotive of this type has been ordered by the Waterloo, Cedar Falls & Northern Railway

A 50-ton, class B-1 locomotive has also been ordered by the Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa. This is an additional locomotive to the four that are operated by the Waterloo road, all of Westinghouse manufacture. The equipment consists of four type 562-D-5 motors, 16 notch "Alf" control, 14-EL air brake equipment, two 35 cubic feet compressors, together with blower equipment. There are approximately 70 of this type of locomotive in service in all parts of the country.

Profits of 392 Companies Up 10.99 Per Cent

Total net profits of 392 companies, in 21 lines of industry and miscellaneous, amounted to $2,268,106,000 in the first nine months of 1928, compared with $2,043,491,000 in the corresponding period of 1927, an aggregate gain of 10.99 per cent, according to a compilation prepared by Ernst & Ernst, accountants, from published financial statements.

Industrials lead the list with an increase of 19.17 per cent. Public utilities follow with a gain of 11.97 per cent. A group of 125 railroads report an income, before certain charges, but on a comparable basis, 3.02 per cent higher than in the same nine months of 1927.

Weekly Business Conditions

Industrial production, as reflected by the activity in steel plants, was greater during the week ended Dec. 1, than in either the preceding week or the corresponding period of last year, according to the weekly statement of the Department of Commerce. Petroleum production during the latest week was greater than in either the previous week or the same period of last year. Lumber output, though showing a gain over the previous week, was smaller than in the same period a year ago. Bituminous coal output was larger during the last available week than in either the preceding week or the corresponding period of 1927.

The general level of wholesale prices showed no change from the preceding week, but was about 1 per cent higher than a year ago. Prices for iron and steel showed practically no change from the preceding week, but were higher than a year ago. The wholesale price of copper showed no change over the previous week, but was almost 15 per cent higher than a year ago.

Loans and discounts of Federal Reserve member banks reached a new high point during the week. Interest rates on time money showed no change from the preceding week, but were consider-

WEEKLY BUSINESS INDICATORS

(Weeks Ended Saturday. Average 1923–25—100)

	1928				1927			
	Dec. 1	Nov. 24	Nov. 17	Nov. 10	Dec. 3	Nov. 26	Nov. 19	Nov 12
Steel operations	109.2	106.6	109.2	113.2	87.0	91.0	88.0	87.0
Bituminous-coal production	.....	112.6	112.1	108.2	92.9	90.6	102.6	97.0
Lumber production	.....	90.9	86.8	90.0	102.3	96.4	104.5	105.5
Petroleum production (daily average)	.....	120.3	119.6	119.9	119.1	119.9	118.4	118.5
Building contracts, 37 states (daily average)	.....	113.4	85.1	104.0	102.4	120.1	133.1	102.8
Price iron and steel, composite	87.3	87.4	86.8	86.5	85.0	85.1	85.4	85.6
Copper, electrolytic, price	114.5	114.5	114.5	114.5	100.0	98.6	97.8	95.7
Interest rates, time money	160.0	160.0	160.0	160.0	97.1	97.1	97.1	94.3
Federal Reserve ratio	84.3	88.3	87.0	89.9	91.9	92.8	91.4	94.3

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ably higher than at this time a year earlier. Prices for stocks made a new record during the week, while brokers' loans were higher than at any other previous time. Interest rates on call loans were higher than in either the previous week or the same week of last year. Bond prices, reflecting higher interest rates, were lower than in either the preceding week or the same period of 1927.

Cleveland Terminal to Have Largest Automatic Substations

The substations of the Cleveland Union Terminal Company, which is equipping the electric zone around the new Cleveland terminal, will be the first in the United States to use 3,000-volt direct current automatic control. Each motor-generator set will be of 3,000-kw. capacity so as to provide sufficient power for the heavy main line movement of passenger trains through the city of Cleveland. The substations, then, will also be among the largest of any railway units automatically controlled. In addition to savings in the cost of operation, automatic switching apparatus also furnishes additional protection which is not ordinarily obtained with manual operation of substations.

Mazda Lamp Prices Drop

President Gerard Swope of the General Electric Company, Schenectady, N. Y., announced Dec. 1, a further reduction in the prices of popular type automobile and flashlight lamps. This reduction averages 8 per cent on the types affected.

This price reduction on miniature lamps is the tenth since 1920. Today's prices of Mazda miniature lamps are 52 per cent under the 1914 prices.

The following price changes were made:

	Old Price	New Price
Mazda 1	$0.10	$0.09
Mazda 1110	0.29	0.27
Mazda 1129	0.27	0.25
Mazda 1130	0.27	0.25
Mazda 1158	0.28	0.26
Mazda 81	0.16	0.13
Mazda 82	0.16	0.13

Largest Electric Railway Exports to Brazil

Of the $212,382 worth of railway motors, electric, mining and industrial locomotives, starting and controlling equipment for electric railway and vehicle motors, railway signals, switches, etc., exported from the United States during the month of September, 1928, Brazil received $96,529 worth of this equipment. Of these exports to Brazil $83,929 was for railway motors and $12,600 was for starting and controlling equipment.

Canada received $48,827 worth of equipment which was divided as follows: Railway motors, $8,170; locomotives, $5,054; starting and controlling equipment, $2,944; railway signals, switches and attachments, $32,659. Japan received $39,273 worth of starting and controlling equipment and $8,800 worth of railway motors.

The classification of the total exports of the United States consists of railway motors, $100,899; electric locomotives, $13,391; mining and industrial locomotives, $3,085; starting and controlling equipment for electric railway and vehicle motors, $58,020; railway signals, switches and attachments, $36,987. The total exports of this equipment for September nearly doubled those of August, which amounted to $106,692.

METAL, COAL AND MATERIAL PRICES F.O.B. REFINERY

	Dec. 4, 1928
Metals—New York	
Copper electrolytic, cents per lb.	15.775
Copper wire, cents per lb.	17.875
Lead, cents per lb.	6.5
Zinc, cents per lb.	6.7
Tin, Straits, cents per lb.	52.5
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.	$4.375
Somerset mine run, f.o.b. mines, net tons.	1.875
Pittsburgh mine run, Pittsburgh, net tons.	1.80
Franklin, Ill., screenings, Chicago, net tons.	1.425
Central, Ill., screenings, Chicago, net tons.	1.15
Kansas screenings, Kansas City, net tons.	1.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.5
Weatherproof wire base, N. Y., cents per lb.	18.625
Cement, Chicago net prices, without bags.	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.6
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.2
Turpentine (bbl. lots), N. Y., per gal.	0.67

Delaware Electric Receives Cars

The Delaware Electric Power Company, Wilmington, Del., has just received ten double-end, double-truck passenger cars from the J. G. Brill Company, Philadelphia, Pa. Plans and specifications of these cars were published in the July 28 issue of the JOURNAL, and a detailed description and photographs were published in the Exhibit Issue of Sept. 22, as this car was exhibited at the Cleveland convention.

The cars are double-end, double-truck type, seat 44 passengers and are 41 ft. 10 in. long, 8 ft. 4 in. wide, and weigh 36,640 lb. The bodies are semi-steel construction with arched roofs and folding-end doors.

The low-level platform, which has been a feature of Wilmington cars for years, has been retained in these new units. Speed in loading and unloading passengers is possible with only one step from the street to the platform. The cost of the cars is said to be about $160,000.

Springfield Rehabilitation in 1928

Rehabilitation of trackwork for the year 1928 by the Springfield Street Railway, Springfield, Mass., cost $357,735. During the year 1927 this company spent $325,000 for trackwork, making a total of $682,735 for the two years. In the year 1928 this company also bought new equipment costing $133,345 and in 1927 the equipment purchased amounted to $920,000, including the purchase of new cars. Most of the equipment purchased this year consisted of motor coaches and accessories. However, nine different labor-saving machines were bought for use in bus and car shops.

The railway had plans for replacing the present single track on Belmont Avenue with double tracks, from Bellevue Avenue to Oakland Street, which would facilitate the operation of cars on Belmont Avenue which is a very heavy traffic line. However, this project had to be postponed as the city was not ready to widen the street.

TRADE NOTES

WILLIAM W. TEFFT, who has been chief engineer of the Commonwealth Power Corporation for the last five years, has resigned to devote his entire time to his consulting engineering practice. He continues his residence and official headquarters in Jackson, Mich., where he has lived for many years. His association with the Commonwealth properties began in 1902 and for some years preceding his appointment as chief engineer of the Commonwealth he was a member of the Fargo Engineering Company. Mr. Tefft is the inventor and owner of the Tefft conduit spillway and accelerator which has been installed in several large hydro-electric developments during the last few years.

JAMES W. ARMOUR has been elected vice-president of the Riley Stoker Corporation, with headquarters at Worcester, Mass. Mr. Armour was graduated in mechanical engineering in 1913, from the Worcester Polytechnic Institute, and after four years in the pattern making business in that city served overseas in the ordnance department, attaining the rank of captain in the 26th division, A.E.F. He entered the drafting department of the Riley Corporation at Worcester in 1919, and after one year was transferred to the Detroit plant of that organization as inspector. He rose to the post of superintendent during the next five years and in 1925 returned to Worcester as engineering manager of the company.

C. C. CREIGHTON, district manager Galena Signal Oil Company, with headquarters in Chicago, has resigned to accept a position with the Standard Oil Company of New York as special representative of the industrial lubrication division, which comprises the railroad lubrication department. Mr. Creighton's experience in the railroad field and his many years service in various departments of the Galena well equip him for his new position. During the World War Mr. Creighton served as a flying instructor in the British Royal Air Force. His new address is care of the Standard Oil Company of New York, Room 1229, 26 Broadway, New York City.

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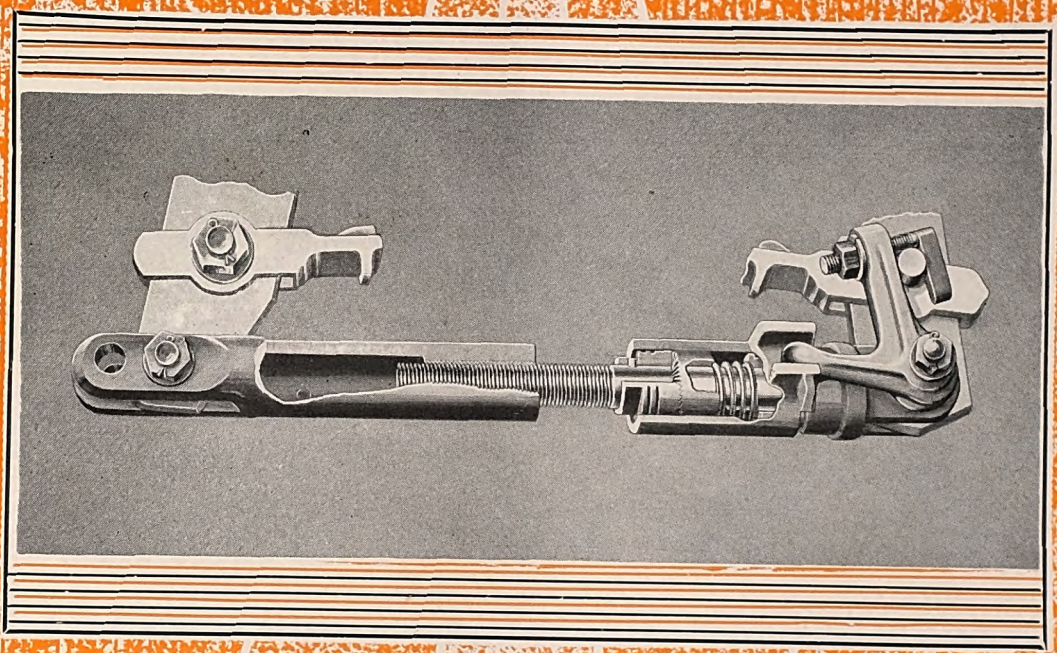

21,000 Miles of Brake Shoe Wear

The Philadelphia & Western Railway, normally secured 8,000 to 11,000 miles of wear from their brake shoes before a change of shoes was necessary. Since the installation of Brill Mechanical Slack Adjusters, this mileage has increased to 21,000 miles in some instances. The shoes weigh 45 lbs. when installed and 18 to 21 lbs. when scrapped.

The Steubenville, East Liverpool & Beaver Valley Traction Company is also well pleased with the Brill Mechanical Slack Adjuster. Their power consumption has decreased about two per cent and no brake failures have been reported.

It will pay you well to make the Brill Mechanical Slack Adjuster standard equipment on your cars. Satisfaction assured.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

Pacific Coast Representative: Rialto Bldg., San Francisco

Brill Mechanical Slack Adjuster

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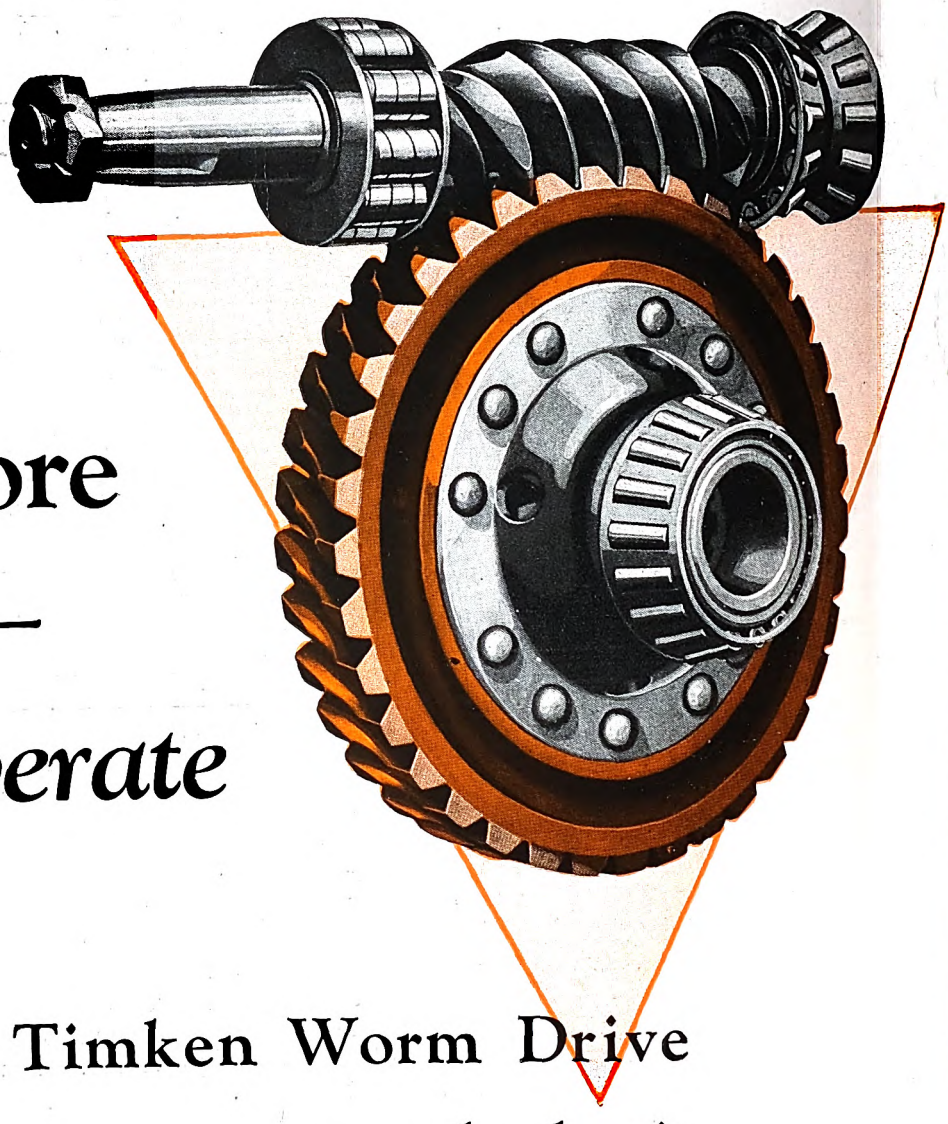

Costs more to make— *less to operate*

Timken Worm Drive costs more to make; but it costs less to operate—and that's your main interest.

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

TIMKEN AXLES

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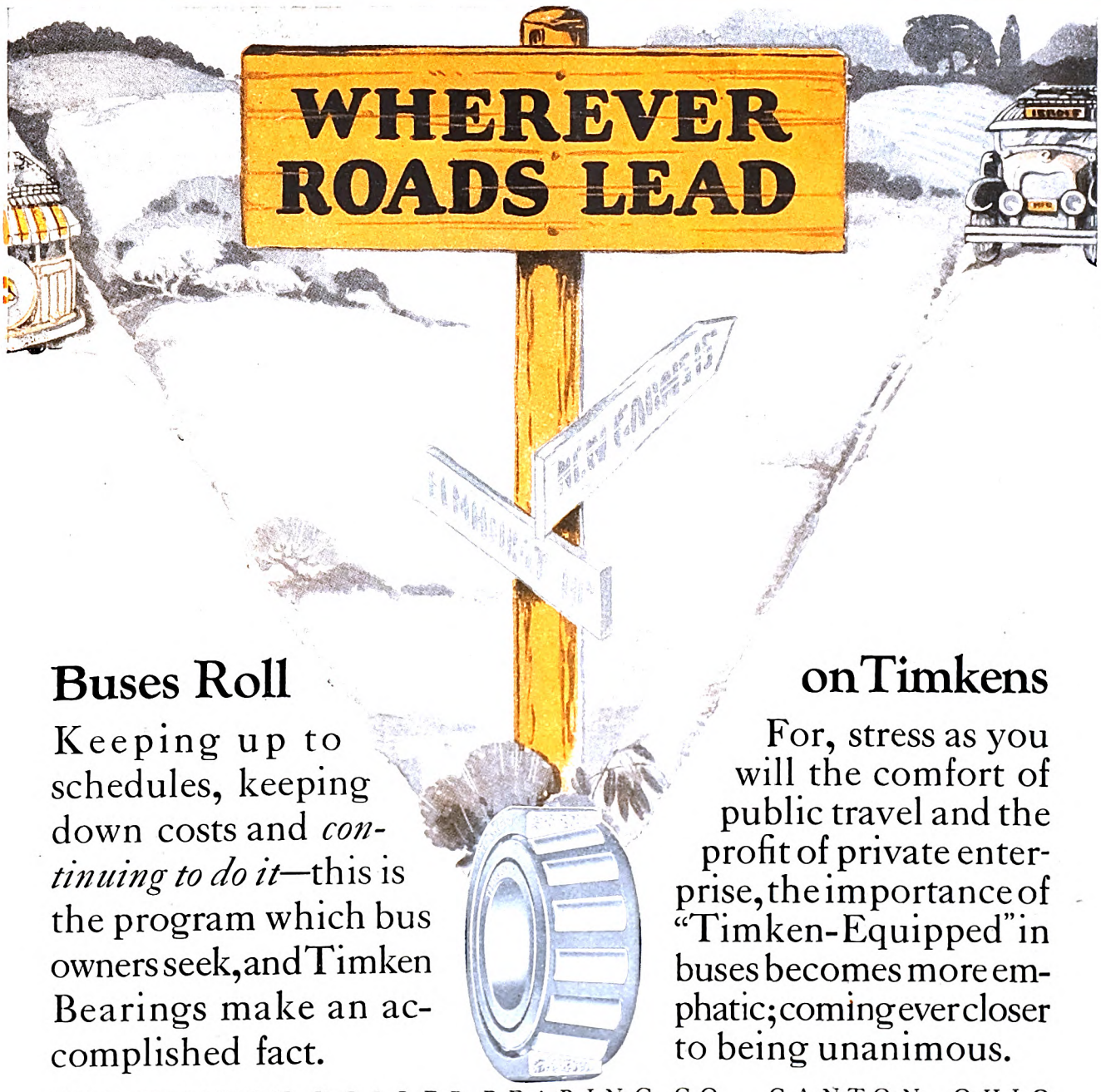
MAINTENANCE AND CONSTRUCTION ISSUE

ELECTRIC RAILWAY JOURNAL

GRAW-HILL PUBLISHING COMPANY, INC. DECEMBER 15, 1928 TWENTY CENTS PER COPY



Buses Roll on Timkens

Keeping up to schedules, keeping down costs and *continuing to do it*—this is the program which bus owners seek, and Timken Bearings make an accomplished fact.

For, stress as you will the comfort of public travel and the profit of private enterprise, the importance of "Timken-Equipped" in buses becomes more emphatic; coming ever closer to being unanimous.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN *Tapered Roller* BEARINGS

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THE BALANCE OF RESPONSIBILITY

May the New Year Bring Success to the Transportation Industry through Fulfillment of Our Mutual Resolution to Maintain That Balance of Responsibility Necessary to Success

Our New Year's Resolutions

Westinghouse Resolves

1. To use modern design and material in the manufacture of parts for old equipment.
2. To provide engineering service to the operator in the interest of economic equipment maintenance.
3. To maintain prices in accord with the value of the commodity.
4. To maintain adequate stock to assure prompt shipments.
5. To continue the use of high grade raw materials.
6. To use the most modern manufacturing practice.
7. To maintain careful inspection.
8. To provide complete ordering information.

The Operator Resolves

1. To take advantage of the opportunity to modernize equipments.
2. To maintain adequate maintenance records.
3. To use only renewal parts which give the highest "Dollar Service Value".
4. To maintain renewal parts stock for protection of service.
5. To maintain thorough equipment overhaul practice.
6. To use modern maintenance methods.
7. To maintain regular and thorough inspection of equipment.
8. To maintain complete ordering information.

The service we get from our renewal parts, and not the price we pay, determines our maintenance cost.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Sales Offices in All Principal Cities of the United States and Foreign Countries T 30233

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA

1928

Westinghouse

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Electric Railway Journal

Consolidation of
Street Railway Journal and Electric Railway Review

McGRAW-HILL PUBLISHING COMPANY, INC.
JAMES H. McGRAW, *Chairman of the Board*
MALCOLM MUIR, *President*
H. C. PARMELEE, *Editorial Director*

CHARLES GORDON, *Editor*

LOUIS F. STOLL,
Publishing Director

Volume 72 New York, Saturday, December 15, 1928 *Number 24*

Keeping the Whole Team in Step

FEW electric railways are entirely free from the difficulty resulting from the unequal influence exerted by the heads of the several departments. On one property it may be the equipment man whose influence predominates. On another possibly it is the track man who has the chief say; on a third, the auditor; on a fourth, the safety engineer; on a fifth, the superintendent of schedules—and so forth. To keep the influence of the department heads properly balanced is one of the vitally important duties of efficient management. It is a case of securing teamwork from a group of acknowledged specialists, each naturally enthusiastic for the advancement of his own department and more concerned about that perhaps than about the functioning of the transportation system as a whole.

To keep department heads pulling together for the good of all is not an easy task. There can be no favoritism in arranging budgets. The general manager must be a diplomat as well as an executive. He must be tactful without sacrificing one iota of final authority and he must be able to stand by his decisions as well as to make them.

Wanted: Maintenance Equipment

UNIQUE indeed is the commercial situation presented by the action of the American Electric Railway Engineering Association in calling attention to the need for improved electric railway maintenance equipment and machinery. To say that it is a strange condition in American industrial marketing, when potential customers for maintenance machinery take the initiative in trying to interest manufacturers in their needs, is putting the situation mildly. Furthermore, when general statements of the need for improved maintenance appliances are backed up by specific examples of what is needed, this matter warrants the serious attention of manufacturers.

Following a suggestion made by the engineering executive committee, the JOURNAL published an announcement requesting maintenance executives to outline their needs in the way of maintenance machinery and equipment. The response was almost immediate, and the first group of suggestions was published in the issue of Nov. 17. That, however, was only a beginning. In this issue there are more along the same line, and each mail brings additional letters from maintenance men adding to the list.

What have the manufacturers of such equipment to say? Obviously this demand on the part of operators represents an indictment of the commercial alertness and progressiveness of manufacturers of shop equipment. Has this class of manufacturers been overlooking the possibilities of the electric railway maintenance market? If not, what are the reasons for the unfilled demand that seems to exist? Perhaps the types of machinery needed are so highly specialized that the development costs would be expensive. Perhaps manufacturers are discouraged by other conditions or practices that exist in the electric railway field. If so, what are these conditions?

In the letters from operating men there seems to be a challenge to the alert manufacturer. The pages of the JOURNAL are open for his reply. Inquiries from manufacturers seeking additional information or letters commenting upon the suggestions being made by the operators will be published as they are received in order that this important subject of maintenance equipment may have the fullest possible discussion.

Significant Interurban News

CONFIDENCE in the earning capacity of the interurban when intensively developed is reflected in the news that application has just been made by the Cincinnati, Hamilton & Dayton Railway to the Public Service Commission of Ohio for permission to acquire the physical properties of the Indiana, Columbus & Eastern Traction Company and the Lima-Toledo Railroad, as well as all outstanding securities of the Lima Street Railway and of the Dayton & Columbus Transportation Company. The plan is fostered by the interests headed by Dr. Thomas Conway, Jr., which rehabilitated and converted the Chicago, Aurora & Elgin Railroad into an important earner, and more recently transformed the Cincinnati, Hamilton & Dayton, physically and financially.

Only the preliminary details of the new consolidation are available at this time, but there is every reason to believe that the development of the properties to be acquired will be carried out along intensive lines similar to those followed in the case of the Cincinnati, Hamilton & Dayton. Moreover, in the matter of the financial set-up it has been indicated that the same conservative course will be followed with respect to the capitalization of the much larger property as was done with the Cincinnati, Hamilton & Dayton. Bonded debt of the two properties now to be included will be scaled from $9,181,000 to $1,390,750, and annual interest charges cut from $469,050 to $83,445. This contemplates a financial set-up even more conservative with regard to the fixed obligations than anything the committee on finance of the A.E.R.A. had in mind, but no more drastic than owners feel necessary properly to re-establish the property on a satisfactory earning basis.

With the Cincinnati, Hamilton & Dayton as the nucleus, the proposed consolidation will form one of the large interurban systems of the country, a through trunk line direct and unbroken, between the gateway to the South at Cincinnati on the Ohio River, and Toledo and the great industrial centers on the shores of the Great Lakes,

This is the issue in December that is devoted essentially to maintenance and construction subjects

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together with an east and west line connecting the cities of Dayton, Springfield and Columbus. To be specific, there will be 323 miles of track in the new consolidated company, and that property with its electric railroad connections will comprise a transportation network of more than 5,000 miles of track serving the great central west. This news, taken together with the previously announced organization of the Electric Railway Freight Company, certainly is significant with respect to the outlook for the interurbans in the central territory.

Supplying Transit for Ten Million a Real Problem

NEW YORK may be said to be only at the beginning of things transit-wise. True it is that the first subway was opened 25 years ago, and that tunnels, both railway and vehicular, cross the Hudson; that passenger tunnels run under the East River to Long Island, both for railroad and rapid transit service, and that where once the architecturally impressive Brooklyn Bridge stood majestically alone over the East River, there are now three other similar structures with another contemplated over the narrows to New Jersey and still another under way across the upper Hudson to connect uptown New York with the New Jersey Palisades district.

Each of these projects has been more or less a matter of expediency. That, of course, was all wrong. It is this recognition which has led the City Club recently to declare that unless some solution of the problem is found quickly, conditions of suburban traffic probably will become, within the next five years, just as intolerable as the conditions of municipal transit are at this time. That body is, of course, cognizant of the studies made by the non-partisan Russell Sage Foundation, the New Jersey Transit Commission, and the Suburban Transit Engineering Board, composed of representatives of the North Jersey Transit Commission, the Westchester Transit Commission, the two county engineers of the counties involved in the Long Island sector, a representative of the Board of Transportation of the City of New York, a representative of the Port of New York Authority, and three representatives of all the railroads involved.

After a long study of the general problems, the City Club's committee on suburban affairs has decided that the Port of New York Authority should be authorized by proper legislative action to take charge of these suburban passenger rapid transit matters. This is an attitude that may or may not be wise in the disposition that it seeks to make of the problem, but there can be no question of the justification for the City Club's conclusion that New York's transportation problem concerns the welfare of 10,000,000 people within a radius of 45 miles from the Manhattan City Hall.

Already there has been entirely too much waste, duplication and unwise construction attributable to the failure to approach the problem in its broad aspects. Whether or not one agrees with the proposal of the City Club to lodge the matter with the Port Authority, it is certain that permanent relief demands the elimination of individual projects conceived by interested groups or sections for their own selfish interests and not for the benefit of the community at large. The extent of the vision of those likely to play a part in a unification plan such as that which the inquiries so far made would seem to indicate are essential in New York, will be measured by the willingness they show to subordinate their own pet plans to the greater one of providing a program suitable for the present and future requirements of the community as a whole. The New York transit problem is immense and intricate. But it is not an insuperable one if it is approached intelligently.

The Back Yard No Place to Keep Lions

BITING sarcasm was turned loose by none other than Mr. Mencken of the *American Mercury,* writing in the Baltimore *Sun* about the traffic problem under the heading "Crowded Streets." It is not the first time that this wizard of words has had his withering fling in the defense of common sense in the use of the public streets. Doubtless he is a street car user. Whether or not that be so, he attacks in a fine frenzy the situation presented by modern traffic jams. He even asks why private motor cars should come into downtown streets at all.

As Mr. Mencken sees it, traffic congestion caused mainly by parked cars is an unmitigated nuisance. With this as a preliminary thrust at the privileged automobile, he turns loose a verbal broadside by declaring that parked cars in heavily traveled streets accommodate only a few idiots, delay the street cars on which 75 per cent of all users of the streets travel, and generally increase the dangers to life and limb in the streets. To Mr. Mencken it seems as insane to allow parking on such thoroughfares as Charles Street in Baltimore and the narrow part of Lexington Street as it would be to permit people to keep lions in their back yard. He contends that the streets belong to the busy man—not to the lazy and luxurious few. He asks why a hundred people should be inconvenienced in going to or from their work by a woman who refuses to walk four or five blocks. He also asks why one citizen should be permitted to appropriate 50 sq.ft. of public property for an hour or two, thus forcing all other citizens to scramble around at the risk of their lives. He says it is all too preposterous.

One thing Mr. Mencken has done. He has taken the tone of timidity out of the words with which this evil has frequently been approached. It is a case in which real militancy is needed. Far too many street railway men themselves seem to find it difficult to forget the old days—the days when street railway men, as Raymond Tompkins, author of "The Troubled Trolley" published in Mr. Mencken's paper, might possibly put it were looked upon as questionable citizens, and the railway itself as the work of Beelzebub. They need to speak up more forcefully. Mr. Mencken is right. The back yard is no place to keep lions. And the street is no place to store automobiles.

Effective Organization Needed to Meet Abnormal Maintenance Demands

MOST electric railways need every available car for peak-load service. This is particularly emphasized by the increased volume of riding during the holiday season. Inspection and repairs during this period must be carried on under trying conditions. Nevertheless, it is particularly important that the work be done thoroughly to avoid troubles and interruptions to service during the peak traffic season of the year. Therefore, since every car is needed, it becomes necessary at this time of the year to devote particular attention to the organization of maintenance work, so that cars will be turned out rapidly.

More intensive specialization and division of work within the several general departments is an aid to in-

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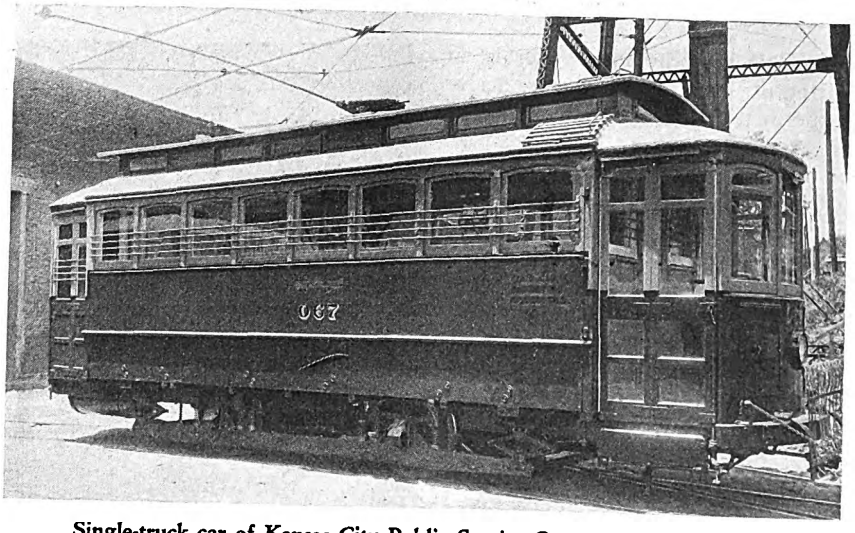


Single-truck car of Kansas City Public Service Company converted into a meter-testing laboratory

Kansas City Builds Test Car to

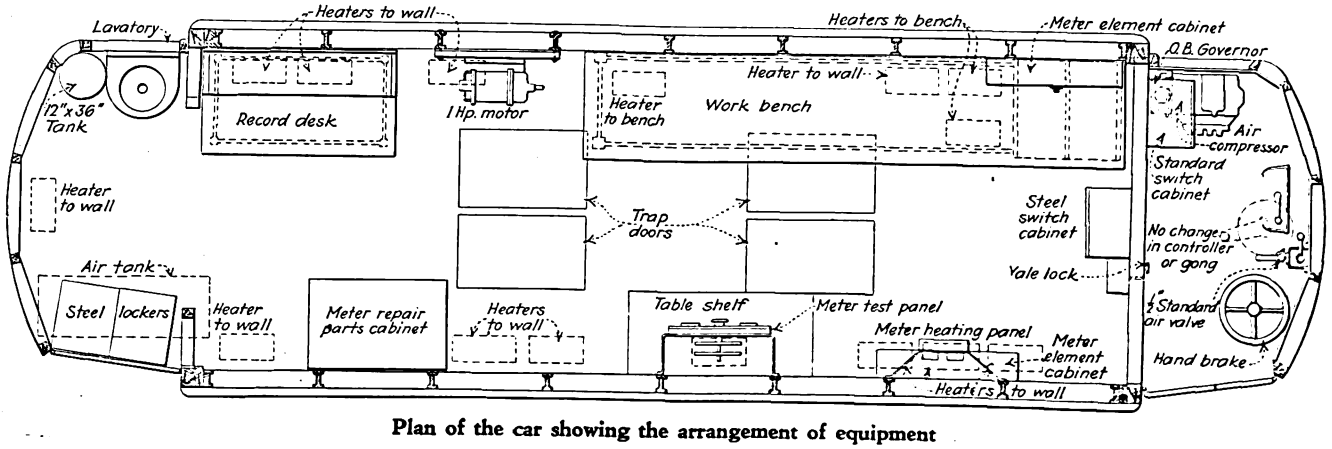
Maintain Energy Consumption Meters

Mobility of this laboratory permits testing meters at carhouses and saves time and expense of transportation to central point. All necessary equipment is provided for repairing and calibrating meters

By R. L. Reynolds
Superintendent of Traffic Kansas City Public Service Company

AT KANSAS CITY the street railway has been a user of energy-saving devices since July, 1917. During December last year 746 Economy kilowatt-hour meters were installed. The organization for handling the power conservation program through the Economy meters functions as a division of the transportation department, with a supervisor in charge. All instructions to trainmen, reports, records and maintenance of the meters, are handled through the car meter department and with the division superintendents. It is thought that by having all this work done under the supervision of the transportation head a better efficiency is secured, as closer co-operation is obtained between the car meter department and the division superintendents and trainmen than would be if the supervision of the meter operation was outside the transportation department.

With the installation of the meters came the necessity



Plan of the car showing the arrangement of equipment

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of a testing laboratory. The kilowatt-hour meter is an accurate energy measuring device, and in order to derive the benefits it affords the meter must be maintained and calibrated on regular schedule. There must also be "trouble shooting" for the meters which get out of order before their regular test period. These things are doubly necessary, for not only must a true record be kept of the periodic energy consumption of each run, line, and of the system as a whole, but the faith of the trainmen must be maintained in the ability of the meters to give them credit for their power-saving efforts; as without the trainmen's confidence, very little would be accomplished toward the end desired.

When it came to the question of the type of laboratory to be installed, the fact that one on wheels could be taken to the meters much more readily than the meters could be taken to the laboratory was self-evident, and a meter test car was built to take care of this part of the power-saving work. It was built at the Kansas City Public Service Company's Tenth and Lister Street shops from a two-motor, single-truck car taken from passenger service.

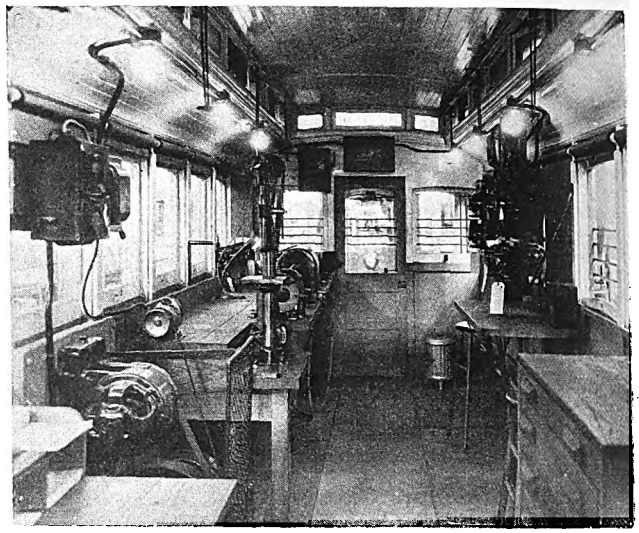
The car was one of the few on the system still operated without air brakes. As it went through the shops this feature was added. The front vestibule, of the inclosed type, is made accessible at all times for the purpose of moving the car about, but other windows are heavily guarded and the remainder of the car is kept locked when not in use, so that the apparatus inside may be protected.

The interior of the car is finished with the upper half white and the lower a Pullman gray. All wiring is done in conduit, and so arranged that circuits not necessary for moving the car can be cut off by a master switch just inside the car door. An Economy meter is used to measure the power utilized by the entire unit. This last item is in connection with the policy of attempting to account for all energy consumed on the property, and segregating it according to character of service.

The laboratory is made up of a work bench with its accessories, the meter element cabinets, the spare parts cabinet, the record desk, a generator battery unit, the element heating panel, and the meter test panel. In addition to these things there are two steel lockers and a lavatory with water storage, for the testers' use. The water storage is in a 20-gal. tank, provided with piping arranged to replenish the water supply through an outside hose connection.

Equipment Arranged for Convenience of Meter Tester

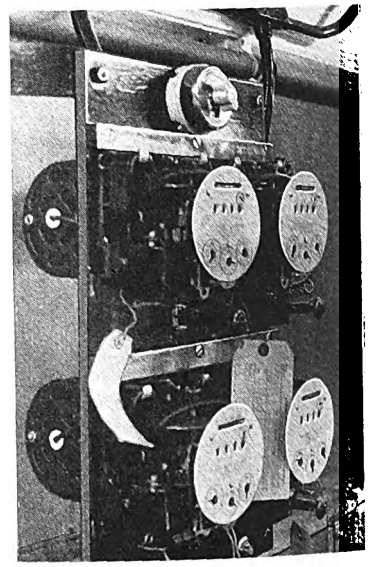
Convenience of the meter tester was considered in the locating of each piece of equipment. All work of taking down the meter, cleaning and reassembling it, is done at one end of the work bench. As the elements are brought in they are placed on an open rack at the back of the bench, and within easy reach are the cleaning lathe, the assembly chuck, a vice, air hose, and the drawers for tools, fresh mercury supply, cleaning rags, etc. Air used for blowing dust and particles from the meters is taken directly from the air-brake storage tank through a Romort air gun. The cleaning lathe is a double-end jewelers lathe with one end partly shrouded, enough opening being left, of course, to get the meter parts into the buffing brush where the mercury is cleaned from them, the mercury and foreign matter falling into a hopper under the shroud. An exhaust fan draws air through the shroud and over a set of baffle plates in the hopper which separates the dust from the mercury. The dust is exhausted outside the car while the heavy mercury draws to the bottom into a porcelain receptacle. As this mercury accumulates, it is reclaimed for further use by a nitric acid process at the company's chemical laboratory.



Inside view of the test car as seen from the rear

A small drill press and grinder placed at the opposite end of the bench are not used so frequently as the other tools, but are found to be almost indispensable at times. This end of the bench was also found to be a convenient location for the 6-volt generator. All rotating machinery is driven by line shaft from a 1-hp., 550-volt motor, with the line shaft running beneath the table.

Directly across from where the elements are cleaned is the meter heating panel. After the meters have been cleaned and assembled they are put on the heating panel to warm, as it was found that a meter tested "cold" against a "warm" standard will not show the same calibration which it would if both meters were warm, due to the fact the resistance of the voltage coil changes slightly with the change in temperature. The difference introduced is not great, but in order to overcome a known error all voltage circuits are warmed to the normal operating temperature before the calibration is made. Since the change of resistance of the current circuit is not discernible and has no effect on the current following through it, this part of the meter is not heated. The heating panel has a capacity of four meters. The meter calibrating or test panel, as well as the heating panel, is made of Transite board, the test panel being mounted above a bench with a clearance room for an element to lie on the bench top be-



View of the element heating panel where voltage coils on the elements are heated before being calibrated

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neath it. Instruments on the board include an 0–15 ammeter, an 0–750 voltmeter, an inclosed Tumbell safety switch for the 600-volt circuit, and an open knife switch for the current circuit. A 7.5-ohm rheostat for current regulation is mounted at the back, with the control knob extending through to the front. Two meters can be calibrated on the panel simultaneously. The working standard is in the lower center portion of the board with an arrangement on either side for the meters to be tested. It is not necessary, however, to calibrate two meters at the same time, as either of the side units can be cut out by shorting across the current terminals of that part, using only the other side. External resistances for the three meters are on the back of the board immediately behind the elements. Binding posts for the elements on test were designed to facilitate mounting these meters, the current contacts being clamped down with wing nuts and the voltage terminals held by spring studs. The test board is adjacent to the heating panel.

The three-meter scheme has proved quite practical for checking the master meters. Two stand-by standards are retained which are checked together with the working standard each morning. These are all stock meters kept apart for this purpose.

As the meters are calibrated they are placed in a twelve-meter cabinet just under the heating panel. A similar cabinet is located over the work bench for storing damaged meters until such time as they are repaired.

Automobile Type Generator Used for 6-Volt Circuit

Current for the test board is provided by a 6-volt generator-battery combination. A motor-generator set was specified in the original design to supply the current, but further investigation developed the fact that a 550-volt motor-generator set for a job of this kind would cost more than it was thought advisable to put into one. As a substitute, a Bosch automobile-type battery charging generator was installed, driven from the line shaft, and the substitute has proved very satisfactory. A 210-amp.-hr., heavy-duty Exide storage battery which provides the necessary reserve, is located directly under the test board in order to reduce the voltage drop to the panel. The generator, being of the automobile type, has an automatic cut-out, eliminating the possibility of the battery feeding back into the generator while it is standing idle.

Two file drawers and three stationery compartments placed at the back of a flat-topped table makes up the record desk. It is here the meter tester keeps his records of the repairs made and meters tested. The spare parts cabinet contains a chest of divided drawers with a large compartment for more bulky materials in the bottom.

The meters are cleaned and calibrated on a schedule that requires the meter tester to make the rounds once in each nine months. In doing this the car is moved to a division where it will remain until all meters at that station have been taken care of. If meters at other divisions are reported as being in bad order the tester replaces them with O.K. elements, and brings the ones replaced back to the car where they are worked over and put into condition for use. When on routine work, the program for the day is made out the evening before and handed to the car placer, who will have those cars run onto a specified track the next morning, ready for the meters to be changed. The meter tester will then replace the elements on these cars with those which he has calibrated the day before, making sure that all register readings are identical with the ones being replaced to insure a continuity of the dial readings. This being done he devotes the remainder of the day to work on these elements at the meter car.

To provide for the needs of the various weights and types of passenger equipment on the property, it was necessary to install meters of five different capacity ratings. The motor elements are all interchangeable, but the register or trains are not, as the ratio of the gear trains vary with the different values of shunts, and anyone handling the meters must take precaution to see that the trains are placed in meters of a like rating.

More Bus Items Needed to Balance Contest

BUS maintenance is not receiving the attention that it merits in the items submitted in Electric Railway Journal's Maintenance Contest. The number of buses in service on electric railway properties has increased rapidly, the problems encountered are new, and much of value can be gained by a broad discussion of them.

Whenever a group of maintenance men assemble discussion of the new bus problems is lively. Other men are experiencing the same difficulties that you are, and when you find a satisfactory solution or an economical method you can assist many other men by passing on the information. Let us have a more extended discussion of this maintenance work.

Contest items are coming in rapidly now. Jan. 15, 1929, is the closing date for the first group of material to be passed on by the judges for the first four departmental prizes of $25 each. The greatest volume of material sent in so far is from the rolling stock and shops and the way and structures departments. Men in the electrical and line and buses and garage departments have a great opportunity to make a good showing by sending in material early. Go over the rules of the contest as published in Electric Railway Journal for Oct. 27, or send for an instruction folder.

$200 for the best maintenance idea submitted.

$300 to be distributed in twelve departmental prizes of $25 each.

A company trophy to be awarded for the greatest contribution to the improvement of maintenance practices, as shown by all items submitted from any particular property.

Departmental certificates of merit to each of the four departments making the best individual showing in the contest.

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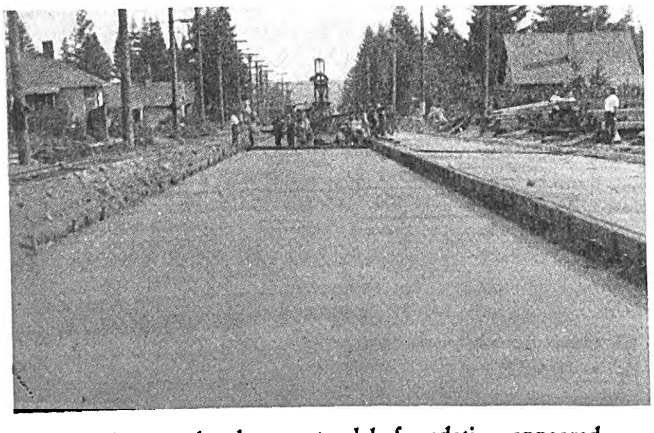
Digging the trenchway for the foundation of new track at Vancouver, Canada

After the steam shovel had finished its work. The 19-ft. trench is now ready for the concrete base

Pouring the concrete for the slab foundation



As the completed concrete slab foundation appeared

Permanent Track Laid in Vancouver

More than $390,000 being expended by British Columbia Electric Railway in constructing new track and replacing temporary rail structures with permanent track

EXTENSIVE construction work has been carried out by the British Columbia Electric Railway on its street car tracks in Vancouver during the last nine months. The work completed included relaying of permanent double tracks on Broadway West, from Granville to Trafalgar Streets, relaying of double paved tracks on Hastings Street East from Boundary Road to Renfrew Street, and construction of new tracks on Clark Drive from Hastings Street East to Venables Street. The existing track on the Hastings Extension line was also replaced to permit paving of road by the city. The approximate cost of these five projects was $290,000.

In addition to the above work, which was completed some months ago, the company's workmen have just finished replacing temporary tracks in Alma Road with permanent double tracks. This work cost approximately $13,000. Another project just completed was the relaying of tracks from Cordova to Hastings Streets on Granville Street. This job was done under traffic, and without diverting cars by another route. The rails in this section were laid in 1907 and are still good according to examination reports after removal. It was feared, however, that they would not outlast another paving which the city proposed laying, and accordingly it was decided to replace this track with heavier rail.

Construction gangs are now engaged in relaying the tracks on Pender Street West, and this job is estimated to cost $75,000. In this case also, similar conditions exist to those on Granville Street, as the track is not worn out, but is believed not to be capable of lasting out a new pavement. A great portion of the track is being laid on existing foundations.

Permanent Track Laid on New Jobs

The policy of the company for the past few years has been to lay permanent tracks on all new jobs, and to replace such temporary track as is necessary with permanent construction work. A typical example of the method followed by the company in relaying tracks, or constructing an extension line, is the work completed at Alma Road. T-rails, weighing 93 lb. to the yard and 62 ft. long were used in this construction. A steam shovel was employed in digging a trench 19 ft. wide, which was trimmed to a depth of 20½ in. Form boards were placed on each side 18 ft. apart, set up to grade and lined up ready for the concrete slab foundation. The concrete slab, when finished, was 18 ft. 6 in. wide, and 6 in. thick. Fir ties were spaced 2 ft. apart, and ⅜-in. steel tie plates were placed in position on these.

The rails used were 7 in. high and 62 ft. long to reduce joint maintenance and give long wear. Tierods were inserted 8 ft. apart. Common planing mill ends were used as shims under each end of the tie to bring the rails to grade. The shims bring the ties up to about 1 in. above the concrete foundation slab, and this space was tamped tightly with a mixture of coarse sand and cement.

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After the steel had been properly surfaced and aligned, a second concrete gang filled concrete around ties and base of the rails, covering the whole substructure of the track to a depth of about 1 in. above the ties. The mixer was provided with flanged wheels and moved on rails in advance of the work.

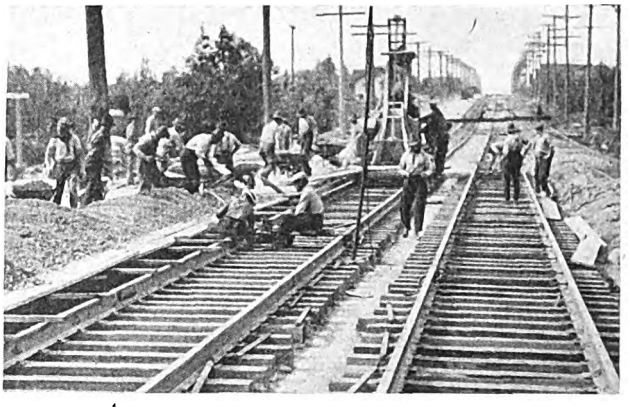
Concrete was carefully tamped to eliminate pockets under the rails, and was struck to a uniform surface of 6½ in. below street level. In Vancouver, the usual paving practice is to use stone header blocks along rails and pave with concrete or asphalt. About 2¼ tons of concrete, steel, and pavement went into each linear foot of double track and the cost to the company was approximately $20 per foot.

Manganese Steel Used Extensively

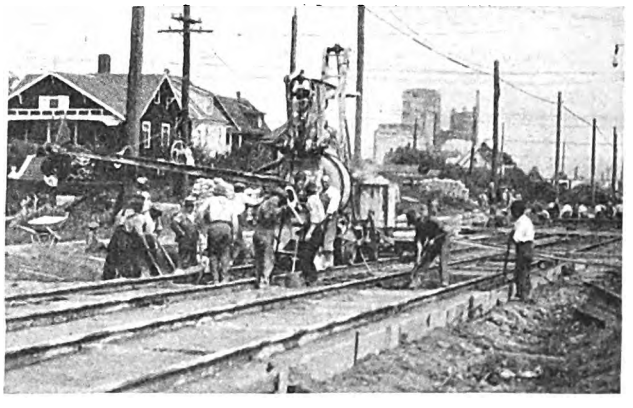
The company also has made a practice of using the specially hardened manganese steel for curves at such points where the traffic is sufficiently heavy to justify the extra expense. At one of the downtown corners in the company's system in Vancouver the curves are of open-hearth steel and wear out every three or four years, while at another corner where there is even greater traffic, manganese curves have been in service since 1912 and are not yet worn out. All switches, frogs and crossings are made of manganese steel. Owing to the growing weight of traffic, much more specially hardened steel is being used now than in the past. Though this steel costs more it is the least expensive when used over a period of years as for track.

In addition to this track laying work, the maintenance-of-way department is constructing an elaborate wye at the turning back point on the Hastings Street East line. Formerly, cars wyeing at this point had to turn up a steep hill and then back down again on to Hastings Street. This hill has now been cut away by steam shovels, and a pit made in the hill, level with Hastings Street and long enough to hold a two-car train with ease. A concrete retaining wall is being built around the sides of this pit and a paved road surface laid down between and around the tracks. Ornamental light standards will be erected on the top of the structure when completed. This work is estimated to cost around $13,000.

Tamping the sand cushion under the assembled track



The track was brought to grade by inserting shims under the ties and the rails aligned before pouring concrete



Concrete was poured around the ties and base, covering the substructure to a depth of 1-in. above the ties

Section of completed track, ready for the street paving

Strathcona Memorial Fellowships in Transportation

YALE UNIVERSITY has issued a notice calling attention to the five Strathcona memorial fellowships of $1,000 each, which are available annually for advanced work in transportation. The holder of one of these fellowships is entitled to pursue investigation in any aspect of transportation in which the university offers competent guidance and supervision, whether along engineering, economic or legal lines. There are many such courses. The holder must have obtained his first degree from an institution of high standing. In making the award, preference is given, in accordance with the will of Lord Strathcona, to such persons or to sons of such persons as have been, for at least two years, connected in some manner with the railways of the Northwest.

Applications for these fellowshps for the coming year should be addressed to the Dean of the Graduate School of Yale University, New Haven, Conn., before March 1, on blanks which may be obtained from him.

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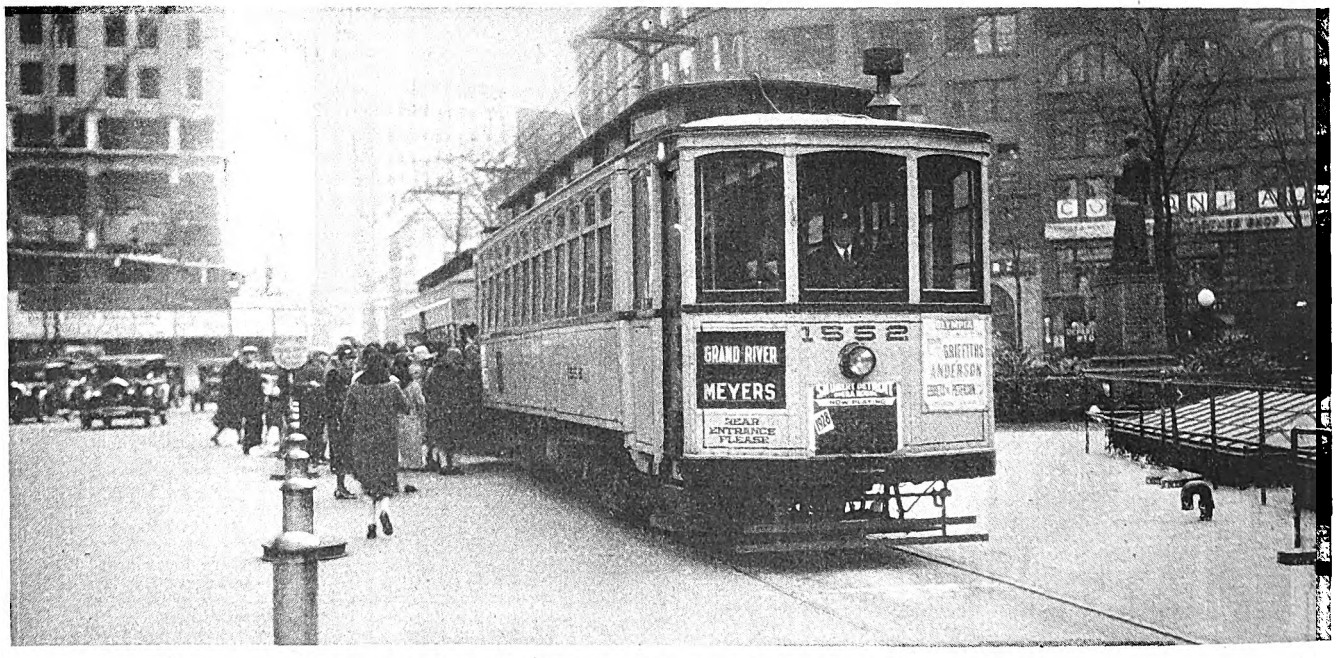
Detroit Extends Surface Rapid Transit System

Street cars now operating on express schedules on Grand River Avenue. Local buses supplement 18 m.p.h. car service. Automatic signals facilitate movement of traffic



A two-car train at the downtown terminal of the Grand River express line

WITH more than a year of experience in the operation of express street car service on the Jefferson Avenue line, the city of Detroit has now inaugurated a similar service on Grand River Avenue. This plan of express service was originally adopted on Jefferson Avenue as an experiment to increase the speed and efficiency of surface transportation on heavy traffic arteries. Cars were operated on an express schedule of 18 m.p.h., making only five stops in a distance of 4.15 miles. Buses handled the local passenger traffic, stopping at each street intersection. Free transfers between the two vehicles enabled passengers originating between express stops to board transfer coaches at the nearest street and transfer to express street cars at the first express station. Prior to the introduction of the express service the cars running on Jefferson Avenue made about six stops to the mile outside of the business district and the schedule speed on the line was less than 12 m.p.h.

This method of operation became so popular that on Aug. 19, 1928, it was extended to the Grand River Avenue route starting with the establishment of an area between Henry Street and Joy Road with express cars stopping at the six intervening streets. On Oct. 3 the express area was extended to Oakman Boulevard with only one stop between that point and Joy Road. Local buses operating in this area make stops at all intersecting streets and deliver passengers to and from the express stations.

Express Service Saves Much Time

Cars operate to the express area from Henry Street to Oakman Boulevard, a distance of 5.24 miles, in 18 minutes or at a speed of 17.47 m.p.h. In the downtown congested business districts the cars make all of the local stops. A saving of seven minutes is reflected over the entire route of the Grand River line west of Oakman Boulevard. It formerly required 32 minutes to travel on the street car from Oakman Boulevard to Capitol Park, a distance of approximately 6 miles, but under express service this run is now made in 25 minutes. In addition to providing a faster service to the traveling public, express service has materially helped to accelerate the movement of vehicular traffic by reason of the elimination of many street car stops where vehicles were formerly required to stop behind a standing street car.

Buses give local service from Trumbull Street near the downtown end of the express area to the last outbound express stop at Oakman Boulevard. The distance traveled by the local buses is 4.54 miles. The local buses pick up passengers between express stops, or carry them to local stops after they have transferred from express cars.

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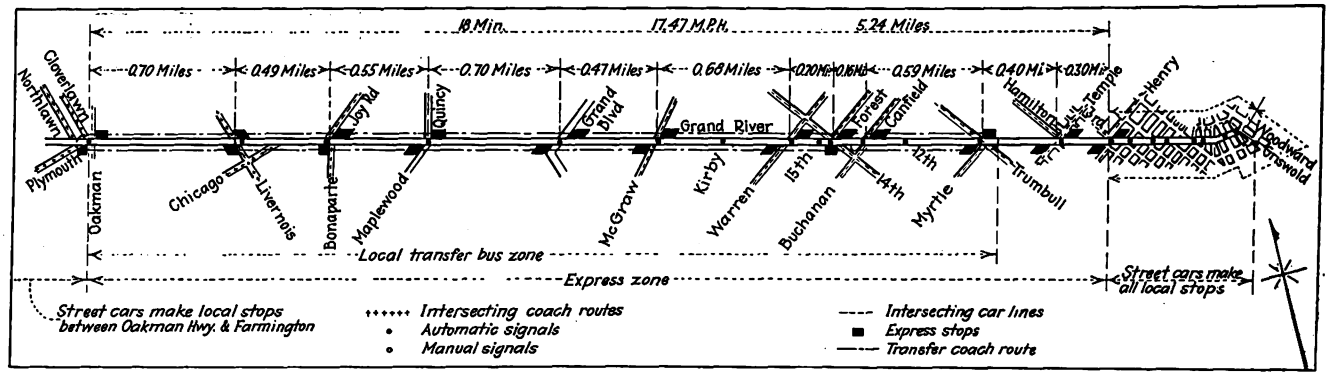

Route of Grand River Avenue express lines, showing location of stops and signals. The local buses terminate at Trumbull Street and Oakman Boulevard

Figures are now available upon which to base an accurate comparison of results of operation on Grand River Avenue before and after the inauguration of express service. An analysis of these figures reveals that during the week before express service was started on Grand River Avenue, average daily operating receipts were $3,437.48 and the average daily operating expenses were $3,038.58, thus making a daily average net of $398.90. These figures are from Aug. 13 to 17 inclusive. For the period from Oct. 8 to 12, after the express service was started, the daily average operating receipts from street cars was $3,798.82 and the expenses were $3,332.41, showing a daily net profit of $466.41, or an average daily gain of $67.51. However, during the same period the average daily receipts from the coaches were $278.65, while the coach expenses were $466.64, thus showing a daily loss of $187.99 in coach operation. The net revenue from both coach and rail operation under express service was $278.42, or $128.48 less than the daily net revenue as shown for the period just prior to express operation.

Only from 10 to 15 per cent of the passengers on the Grand River line take advantage of the transfer facilities. By far the majority take either the car alone or the coach alone. As the system is operated, free transfers are given from the transfer coach to the express trolleys, while passengers transferring to intersecting lines pay only 1 cent for their transfer. Many more passengers transfer from car to coach than vise versa. The purpose of the bus operation is to provide another facility, which is taken advantage of by most of the passengers for a complete ride. This means naturally that the bus service must be kept well within bounds or otherwise the combined operation will show a loss.

Automatic Signal Devices Helpful

Traffic on Grand River Avenue, as well as on Jefferson Avenue, is now controlled by automatic traffic signal devices which favor the movement of cars at the same time expediting the movement of all vehicles on the street. The control consists of a combination of five relays connected in the circuit between the automatic timer and the signal head of a trolley traffic signal, and controlled by two trolley contactors on each trolley wire.

The normal position of the device is such that the automatic timer of the traffic signal controls the periods of the red and green lights, and when the street car operates the so-called "on" contactor, this device holds the green light on the railway side of the traffic signal until it is again released by the street car passing the

DAILY AVERAGE FIGURES, GRAND RIVER EXPRESS SEVICE

	Cars		Coaches,	Combined Operation Car and Coach,
	Aug. 13-17	Oct. 8-12	Oct. 8-12	Oct. 8-12
Miles	9,822.64	11,202.97	1,740.40	12,943.37
Revenue	$3,437.48	$3,798.82	$278.65	$4,077.47
Expense	$3,038.58	$3,332.41	$466.64	$3,799.05
Net revenue	$398.90	$466.41	*$187.99	$278.42
Revenue passengers	56,151	61,950	4,476	66,426
Transfer passengers	21,267	23,429	1,041	24,470
Free transfers	.....	1,209	781	1,990
Total passengers	77,418	86,588	6,298	92,886

* Daily loss.

The bus drives to the left of the station while all other vehicles must pass to the right. Both car and bus wait for the interchange of passengers from one unit to the other

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"off" contactor, when the device again assumes its normal position. The principal of operation of this device is to hold the green light on the railway side of the traffic signal without in any way interfering with the operation of the automatic timer, which is electrically interconnected with all other signals on the avenues through a master timer.

Traffic Device Operated by Cars

The "on" contactor is located at a suitable distance from the traffic signal, so that when an approaching street car passes under the contactor the operation of the device will hold the green light, if it should be lighted at the time the car passes under the contactor. On the other hand, if the red light is lighted when the car passes under the contactor the normal time period of the red light is prolonged so that the signal will change to "go" at approximately the same time the car reaches the corner.

During the peak hours the headway is so short that cars would pass the traffic signal at such frequent intervals that they would cause the green light on the railway side to remain lighted continuously and thereby interfere with cross traffic. To overcome this objection one of the relays of the combination has a time element adjustable from approximately one second to 30 minutes. This time relay is so connected in the circuit that when cars pass the traffic signal in the normal green period this relay does not function. However, if the operation of the cars is such that the green signal is kept lighted continuously for a period corresponding to the setting of this time relay, it will automatically disconnect the trolley contactors from the circuit at the end of its period and allow the automatic timer of the traffic signal to change the light from green to red for one normal period, after which time the cycle may again be repeated.

By this means it is possible to increase the period of green on the railway traffic from the normal period of the timer to any desired period. On Jefferson Avenue the time has been set for two minutes and 45 seconds. This was derived after a number of experiments and was found to allow practically all of the cars to pass without being delayed, at the same time not unduly obstructing cross traffic.

EQUIPMENT REQUIRED—DETROIT EXPRESS ROUTES

	One Way Route-miles	A.M.	Base	P.M.
Grand River cars	11.0	94 (42 trailers)	35	100 (46 trailers)
Grand River buses	5.25	18	9	18
Jefferson cars	6.76	71 (15 trailers)	16	51 (9 trailers)
Jefferson buses	4.15	33	15	43

Buses only operate through express zones.
Cars operate to city limits.

Sheltered Safety Zones Erected

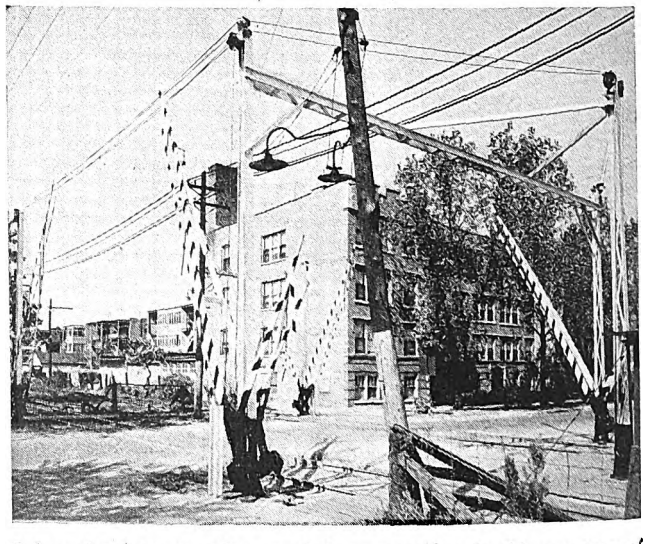
The safety zones at the express stops are the standard type used in Detroit, being 88 ft. long with upright stanchions 6½ ft. from the track and placed about 8 ft. apart. Canvas awnings over the safety zones and splash guards around the side have been erected to afford shelter for the passengers transferring between the local buses and express cars.

The buses pick up and discharge local passengers at the curb. At the express stations all vehicular traffic, with the exception of the motor buses, is compelled to drive to the right of the station. The buses run inside the safety zone, receiving and discharging passengers directly into the zone. Should a car and bus approach the station at the same time, the car is given the preference, but both the car and bus wait for the interchange of passengers from one unit to the other.

The average number of passengers carried per day by the combined operation of cars and motor coaches on the Grand River express service is 92,886, compared with 77,418 passengers per day carried by the cars before the express service was inaugurated. It is evident that the Grand River express service is meeting with the same public favor as that shown on the Jefferson Avenue line, and it is planned to extend the express area beyond its present limitations as soon as the work of constructing new tracks on Grand River Avenue is completed.

All Mechanism Above Ground in New Crossing Gate

AN IMPROVED type of overhead cable-operated safety gate for grade crossings has been developed by the Chicago Rapid Transit Company and is now being given a test at the Sacramento Avenue crossing on the Ravenswood branch of the North Side division. Constructed by one of the Rapid Transit signal engineers, this new gate eliminates all sub-surface construction work. An overhead steel frame, consisting of five upright beams 22½ ft. high and one cross-span, carries the cables connecting the gate arms with the levers in the operating shelter. The gates are of the two-cable construction. There are two levers, each controlling the gate arms on one side of the crossing.



Sub-surface construction work is unnecessary in this new type of crossing gate developed by Chicago Rapid Transit Company

The principal feature making this new gate an improvement over other manually-operated types lies in its greater operating efficiency. The gate arms can be stopped almost instantaneously at any position when being raised or lowered. Another factor that makes for greater grade crossing protection is the elimination of all danger of the cables freezing in cold weather, which frequently happens when the control apparatus is underground. Maintenance costs also are reduced by the new gate, due to its simplicity of construction, according to Rapid Transit engineers.

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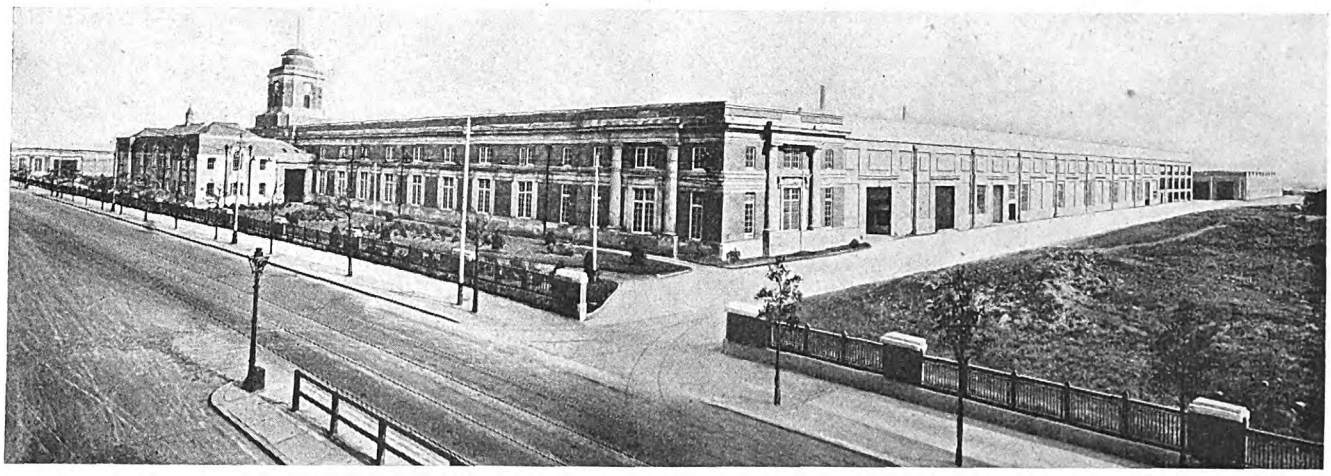
Liverpool Builds New Shops

Attractiveness of exterior and completeness of interior equipment for car repair are characteristics of the new plant of the Corporation Tramways



This building houses the new shops of the Liverpool Corporation Tramways

DESIGNED as it is in the classical renaissance style, with brick façade, stone pilasters, trim and set in a park, the attractive building pictured above might be taken by an observer, at first sight, to be a public school or State Capitol. Actually, it is a repair shop, just erected by the Liverpool Corporation Tramways for the maintenance of its cars and buses. The foundation stone was laid on May 17, 1926, and the official opening took place only on Oct. 17, 1928. The ground on which the shops are located comprises 15 acres. The building itself covers 7 acres, not including a car-house, which has been built on one side of the plot and which covers more than 1 acre.

The front of the shops, as explained, is of brick, and the side and back elevation of reinforced concrete. The interior walls are also of reinforced concrete, finished with whitewash.

The main building is set 114 ft. back from the street on which it fronts; it has a frontage of 600 ft. and extends back a similar distance. In front, at the center, is the administrative block, containing offices, drafting rooms, lecture room, etc. On the second floor are dining rooms to accommodate the 800 employees, together with kitchen, etc. In the rear of the administrative block is a glass-roofed covered passageway, giving access to the shops.

The main area of the shops is divided into bays, extending parallel to the front of the building, with a traverser or transfer table with track extending the entire length of the building in the center. The transfer table is operated by a 25-hp. motor. The carhouse roof is supported on latticed posts set 45 ft. x 44 ft. 6 in. apart. Steam heating is used and the radiators are mounted on these posts, as shown in one of the illustrations.

The roof girders are set higher than might otherwise be the case because of the need of providing for double-deck cars. The roof is braced on all sides for wind and is of the sawtooth type. Boarding and slates are used for the 30-deg. south slope, and wireglass for the north slope.

To the left and immediately inside the main entrance of the plant is the electrical shop. It has a total floor area of 23,670 sq.ft. The electrical test room is situated on a gallery of this shop.

Beyond the electrical shop is the car repair shop, having ten pits, with a total length of 1,760 ft. This shop is equipped with three overhead cranes of the three-motor slip-ring type, and with various machine tools, such as lathes, planers, millers, grinding machines, wheel tire heating apparatus, etc. To the left of these shops and running the full length of the car repair shop is the fitting shop. At the north end of the fitting shop are three electric and one acetylene welding sets. The repair and overhauling shops have an area of 87,750 sq.ft.

Directly beyond the car fitting shop is the blacksmith shop, foundry and pattern shop. The blacksmith shop is fitted with power hammers, power cutting shears, fifteen blacksmith hearths, case hardening ovens, etc. The floor is of beaten ashes. The pattern shop adjoins the brass foundry and has an area of 1,670 sq.ft. The foundry has twelve furnaces, and is equipped with coke ovens with adequate working space for molding. Behind these shops are sand and foundry bins. The blacksmiths' shop has a floor area of 9,900 sq.ft., the pattern shop of 1,670 sq.ft., and the foundry of 3,620 sq.ft.

On the right side of the main entrance is the paint shop, which is self-contained and cut off from the dust from the other shops. It includes a varnish maturing room, bus varnishing room, drying room, etc., as well as a sign painter's gallery. This shop is separately heated to keep an even temperature throughout the year. An air purifying chamber on the west side supplies washed

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and heated fresh air which is delivered from overhead. This shop has space to deal with 40 cars at any one time. It occupies an area of 32,210 sq.ft. exclusive of the sign painter's gallery, which has an additional area of 4,000 sq.ft.

Beyond the paint shop is the body repair shop, having six pits with an aggregate length of 1,042 ft. This shop has sufficient room for 30 cars, and is equipped with a special hot water supply for use in connection with the periodic washing of cars.

Adjoining the body repair shop is the body building shop. A foreman's office overlooks the body repair and body building shops and the saw mill. In the body building shop 24 cars or motor bus bodies can be dealt with at one time.

Adjoining the body repair and body building shop, but cut off from them by concrete walls and armored doors, is the saw mill. It is top and side lighted, has a wood block floor and is fitted with machines for dealing with timber from the log to the finished product. Dust and shavings are removed through a dust chamber near the outside entrance. The sawmill has an area of 12,400 sq.ft.

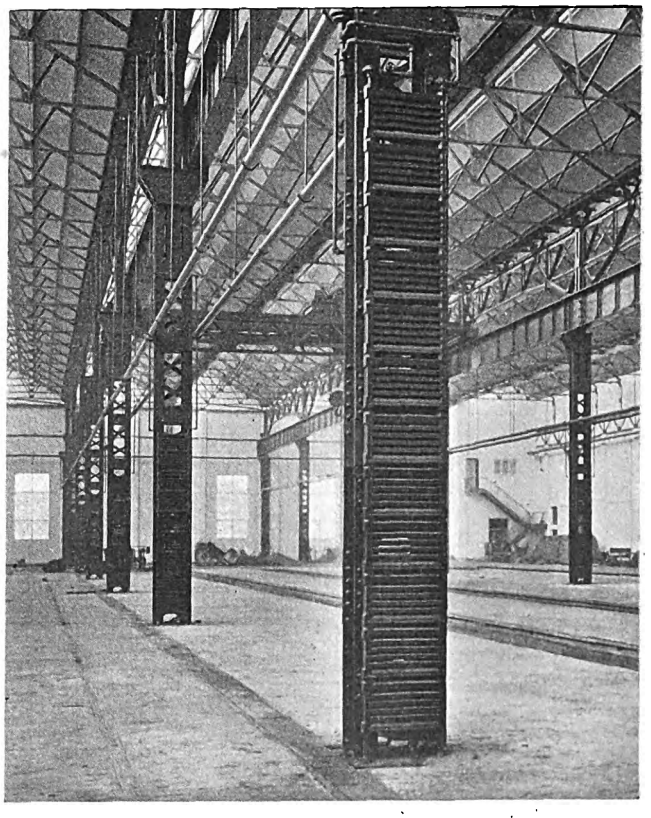
The final section on this side of the shop is the storeroom with 109 ft. of counter, and especially selected steel racks to fit the various parts of the equipment of cars and buses. Additional racks for storage on galleries provide an area of 4,500 sq.ft. besides the main area of the storeroom, which is 20,898 sq.ft. Lighting is from above. A railroad track leads up to this building.

Beyond is the store department, and in a separate building is the bus repair shop. It is entirely of reinforced concrete with steel frame and has an asphalt finished floor. It contains a series of inspection pits and is heated from the main building. Adjoining these shops on the left are the gasoline storage tanks, two in number, with a total capacity of 24,000 gal. Pumping equipment permits a delivery of 15 gal. per minute from each tank.

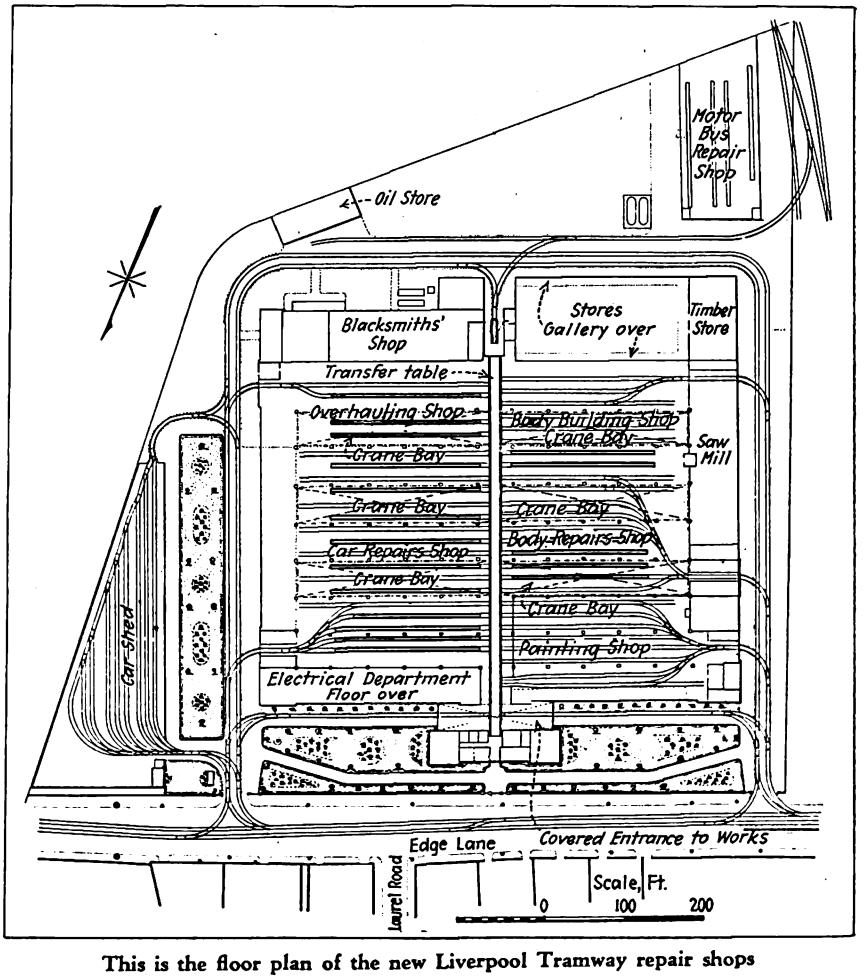
Near to the motor bus shop are the hydraulic gasoline storage tanks which are fed directly from tank cars from the railroad siding. These tanks, which are placed underground, have a capacity of 24,000 gal. The installation is divided into two distinct plants, each giving 15 gal. per minute delivery when all draw-off points are in use.

A 6-in. water main encircles the whole of the main building with a branch taken from the south end down the center of the building under the transfer table way. From these mains 4-in. branches fitted with standpipes serve the entire works, while on the 6-in. mains outside there are hydrants at essential points.

All external doorways at the sides and rear have steel roller shutters for the larger openings, and wood doors for the small openings. The internal entrance ways have steel roller shutters. The car entrances have armor-plated fireproof doors.



Radiators for the steam heat are attached to the vertical supporting posts



This is the floor plan of the new Liverpool Tramway repair shops

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Commission Orders Crossing Signs

ORDER No. 75 of the California Railroad Commission, dealing with warning devices, is one of the most extensive ever issued by a similar body as regards highway protection. The ruling not only directs that electric interurban and steam carriers shall provide wholesale additional signs and signals at crossings, but indicates the type that shall be erected or installed at specific locations. It also standardizes into four classes the type, size, shape and location that will henceforth be acceptable to the commission. A number of abandonments of former types and relocation of numerous devices were ordered in the cases of several carriers.

Briefly stated, the following are the four standards of protection, outlined in the commission's order early this year:

Standard No. 1 is the common "crossed-arms on post" with black lettering "Railroad Crossing," to be located in a conspicuous position facing highway travel, preferably at either corner of the crossing intersection on the right-hand side of the highway traffic flow and in advance of the railroad track.

Standard No. 2 is a suspended sign with a white X on a black field. This field is 24 in. square. The sign may be used at a crossing in addition to the crossing sign designated as standard No. 1, or in cases approved by the commission, may be installed in lieu thereof. It must be placed in a conspicuous location facing highway traffic and preferably be illuminated during night hours.

Standard No. 3, a wigwag, or automatic flagman, is to be located in a conspicuous position facing highway travel, preferably at either or both of the corners of the crossing intersection on the right-hand side of highway traffic flow and in advance of the railroad track. The warning aspect of the wigwag is a swinging red disk by day, in combination with a swinging red light by night. Unless omitted by special permission of the commission, the warning aspect shall be accompanied by the sounding of a bell. This wigwag is automatic, being started and stopped by trolley or rail contact devices. Installation is at curb.

Standard No. 4 is a wigwag, similar to No. 3, but installed in the center of the highway, on a heavy concrete base.

In addition to these standards, the state law prescribes advance warning signs, 300 ft. on each side of railroad crossings, to be put up by the county or city. This type of sign is circular, with a white cross on a black field, and is set on posts.

While the aggregate expenditure and number of new signs and signals to be installed by all railroads in California under this order is not available, the scope of additional protection may be seen by the manner in which the Pacific Electric Railway, operating in Southern California, is affected. On the lines of this railway, under the order, there are now 298 additional No. 1 crossing signs, 428 suspended No. 2 signs and 96 private crossing signs being erected. Four automatic flagmen are being installed and nine No. 1 crossing signs relocated.

With the exception of the new standard No. 2 the devices in the approved new standards have previously been used in California. A view is presented of this sign in use.

This new type of warning sign of a crossing is being used extensively in California. It is in addition to other warning devices

Government Provides New Form of Transportation Request

ELECTRIC railway companies are urged by the Assistant Comptroller General of the United States to familiarize themselves with the new procedure of the department in regard to the handling of transportation requests. Ticket agents and conductors on interurban lines should be advised regarding the nature and form of the identification cards and requests, so that a government employee traveling on official business would have only to fill in the necessary information and present them to any authorized agent to secure transportation to the value of $1 or more.

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—49

Emergency Stopping Device for Electric Cars*

By Albert Rivet
Carpenter Shop Foreman
Union Street Railway, New Bedford, Mass.

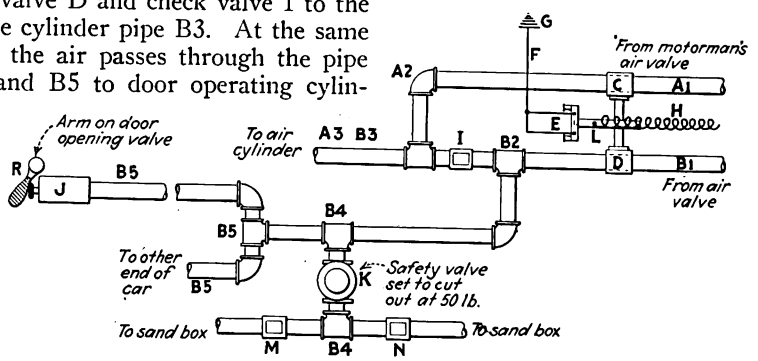
RECENTLY the Union Street Railway, New Bedford, Mass., increased the number of one-man cars in operation. Before inaugurating this service, it was necessary to equip a large number of cars with an emergency stopping device. All of these cars had manually operated doors. It was decided to place the customary pull cord in the center of the car, so that passengers might make an emergency stop. While this method is not new, the mechanical operation and the piping arrangement, was developed along somewhat original lines.

The operation may be followed by referring to the accompanying diagram. When the car is operated in the regular manner, air passes from the motorman's air valve through the pipe A1, valve C, and pipes A2 and A3 to the air cylinder.

To make an emergency stop the passenger can pull the knob G easily. This is attached to the cord F that trips the release catch E. When released the lever L is brought instantaneously into a vertical position by means of the strong spring H. This action closes valve C and opens valve D, so that the air then passes from the air tank directly through the pipe B1, valve D and check valve I to the brake cylinder pipe B3. At the same time the air passes through the pipe B2 and B5 to door operating cylinders and circuit breaker plunger J and also through the pipe B4, safety valve K and check valves M and N to the sand boxes.

When the air operates the piston of the cylinder J, it pushes against the arm R that opens the manually operated doors. The same action cuts off the power circuit.

To reset the apparatus it is necessary only to pull the lever L back down under the release Catch E.



Equipment and piping arrangement for emergency stopping device as applied to one-man cars of the Union Street Railway

Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

TRACK AND WAY DEPARTMENT—39

Auxiliary Ground Box for Track Switches*

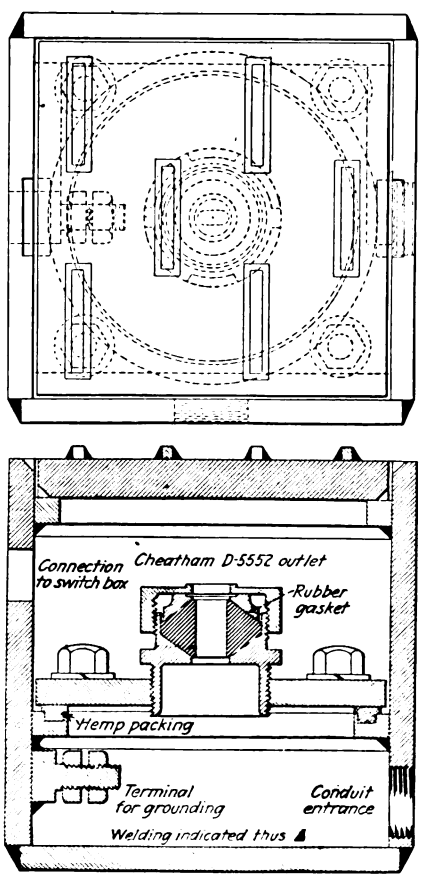
By L. H. McAdam
Electrical Department
Toronto Transportation Commission,
Toronto, Canada

DIFFICULTY has been experienced on lines of the Toronto Transportation Commission with water getting into the conduit which carries wires from poles to track boxes. This water freezes in winter, and in case of trouble on the wires it is necessary to dig up the conduit, which often results in considerable labor.

To overcome this trouble an auxiliary ground box is placed alongside the track box. This is used in making a flexible watertight connection between the circuit changer box located on the pole, and the track box cylinder of an electric track switch. The two-compartment ground box is made of $\frac{1}{2}$-in. steel plate, and is 8 in. square. All joints are welded and the lower section is waterproofed by means of a $\frac{3}{8}$-in. hemp gasket.

The underground wires are extended from the lower chamber through a D-5552 outlet by means of heavily insulated flexible twin cable which connects with the cylinder. A grounding terminal is provided in the lower compartment of the box at one side.

Since these boxes have been installed water is kept out of the conduit, and in case of trouble it is much easier to remove the underground wires. This type of installation also permits the cylinder to be removed readily and with less damage to the connections.



Auxiliary box for connections to electric track switch

Submitted in Electric Railway Journal Prize Contest.

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Electric Railway Journal Maintenance Data Sheet

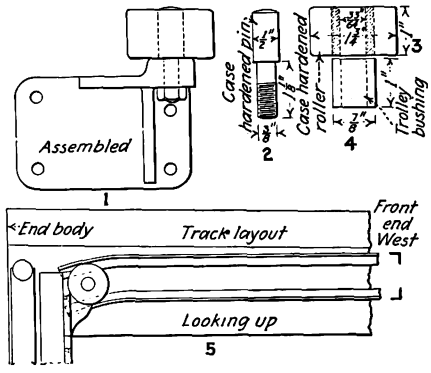
ROLLING STOCK—MISCELLANEOUS—50

Making Car Doors Operate Faster*

By F. A. Marsh
Superintendent of Equipment
Municipal Railways, St. Petersburg, Fla.

SCHEDULED speed of an electric car is dependent upon the operation of the slowest piece of equipment. On the Municipal Railways, St. Petersburg, Fla., the slowest device to function was the car doors. As these were interlocked with the controls for safety they must close before the car can start. Hesitation in door operation held up the getaway of the car and was also annoying to both operator and passengers.

To remedy this condition the old small roller in the door hanger was discarded and a case-hardened, graphite and bronze bushed roller 1 in. high by 1¾ in. in diameter, turning on a ½-in. case-hardened pin was substituted. By curving the overhead track ½ in. outward, as shown in the accompanying sketch, an additional source of trouble was eliminated, and now a car is seldom turned in or even reported for door trouble. Feist oilless hinges were installed and, together with the trolley bushings in the door roller, they remove the necessity of oiling door mechanism. This saves time and also trouble from oil on the doors.



Assembly and details of roller and track for car doors

The cost of these modifications was less than $1 per door. Many have now been in service two years and the saving in cost of pull-ins and detriment to service has already paid the cost of the changes in the mechanism. This method of door roller and track construction has been adopted as standard by the railway, and all future cars purchased will be ordered equipped in this manner.

**Submitted in* Electric Railway Journal *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

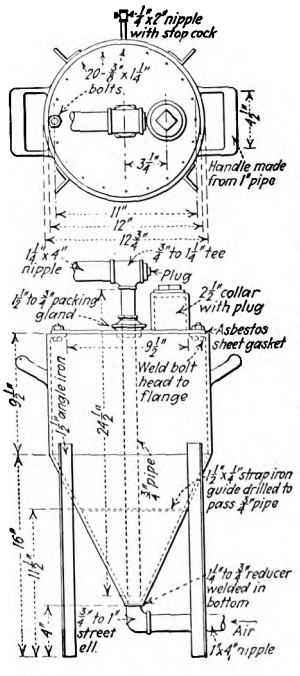
TRACK AND WAY DEPARTMENT—40

Sand Blasting Ties and Rails Before Welding*

By Louis T. Botto
Superintendent Maintenance of Way
San Antonio Public Service Company,
San Antonio, Tex.

DURING the month of October, 1928, the San Antonio Public Service Company, San Antonio, Tex., reconditioned 2,000 ft. of track with 60-lb. A.S.C.E. rail. For this work the asphalt paving and concrete was removed from both sides of the rails to the top of the steel ties. All tie-bolts and clips were removed and new bolts and clips were applied to every other tie. On the alternate ties the clips were electrically welded to the ties and no bolts were used. To provide a satisfactory welding job an air-sandblast was used thoroughly to clean the rails and ties at the point at which the welding was done.

The sandblast device consists of a funnel-shaped reservoir for the sand, and a piping arrangement so that the sand is forced by air through the opening at the bottom into a 1-in. pipe. The accompanying sketch shows the construction. Air for this sandblast device was furnished by a compressor and, in one hour, more and better work was done than was possible in eight hours previously with four laborers using chisels and wire brushes. The device is simple and inexpensive but has proved to be very efficient.



Type of sandblast machine used by San Antonio Public Service Company for sand blasting rails and ties previous to welding

**Submitted in* Electric Railway Journal *Prize Contest.*

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—51

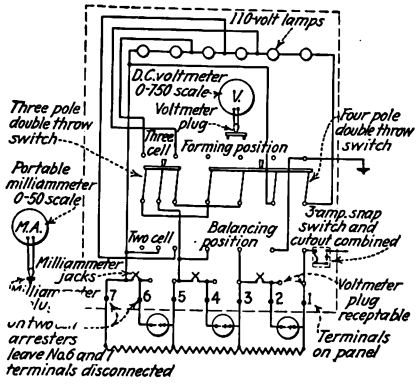
Equipment for Testing Lightning Arresters*

By H. J. Beadle

Engineer of Equipment Dallas Railway & Terminal Company
Dallas, Tex.

BELIEVING that protection against lightning is well worth the additional amount necessary to keep cell type arresters in good condition, the Dallas Railway & Terminal Company, Dallas, Tex., has arranged a special test outfit for this work. Aluminum cell lightning arresters of the two and three-cell types are used extensively by the railway on its cars. The chief advantage of the cell arrester over the gap type is the elimination of the time lag in the gap. During the past year, out of 77 four-motor cars equipped with aluminum cell arresters, not a single armature has been lost due to lightning. On the other hand, out of 200 two-motor cars protected with gap type arresters, seven armatures were lost which could be attributed as the direct result of lightning.

A two-cell aluminum arrester costs about $19 and allowing a life of five years which is conservative, the capital cost per year is $3.80. Adding to this the maintenance cost of $1.40 and the interest at 6 per cent, or $1.14, the cost per year is $6.34 not including installation, which would be about the same for any type of arrester.



Testing circuits as used for lightning arresters

The outfit for testing and building up the films cost the company about $150. The connections are shown in the accompanying illustration. It is complete for two and three-cell operation and was built in the shops of the railway. Before the arresters are put in actual service the films are built up by throwing the four pole switch in the position marked for forming. In this position the cells are placed in series with the six 110-

*Submitted in Electric Railway Journal Prize Contest.

OVER

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—52

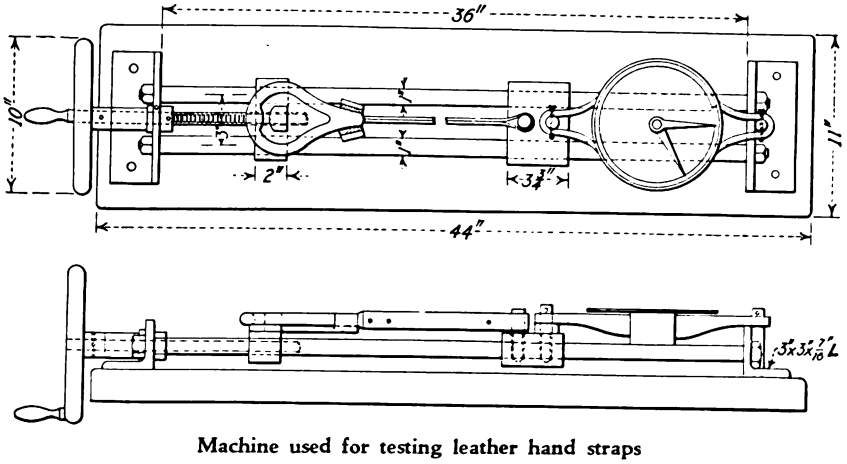
Hand Strap Leather Testing Machine*

By H. J. Coventry

Chief Draftsman United Railways & Electric Company
Baltimore, Md.

JUDGMENT of various inspectors has been relied upon by the United Railways & Electric Company, Baltimore, Md., to decide when hand straps should be removed from the cars as unfit for further use. The object of such inspections, of course, was to remove the strap and avoid actual breakage while the cars were in service. With this method it was inevitable that straps were removed for surface cracks although actually much stronger than others showing no cracks. This led to the desire for some method which would give definite knowledge as to the serviceability of a strap. A machine was accordingly constructed for submitting the strap to a tensile test under a measured load.

The machine consists of a frame tapped to receive a ¾ in. screw control work with two stud blocks free to trolled by a handwheel. A spring move on guide bars. One block is balance fastened to the other block



Machine used for testing leather hand straps

*Submitted in Electric Railway Journal Prize Contest.

OVER

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Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—51

Equipment for Testing Lightning Arresters*—Continued

volt lamps at the top of the panel. Immediately the lamps will burn bright and then become dark, showing that the film on the plate has been built up and no more current is allowed to flow in the circuit. The lamps are used merely to reduce the amount of current flowing during the formation period.

After the film has been formed the four-pole switch is thrown into the balancing position where it remains until everything abnormal has ceased and each cell has approximately the same voltage. Voltage readings are taken by inserting a voltmeter plug in the voltmeter receptacles. After the readings have been taken the voltmeter plug is removed and milliammeter jacks are inserted in the places marked in the illustration. This shows the leakage current across each cell. At first the leakage current is rather high but soon comes down to a normal value of about one milliampere. It is found that the leakage current per cell may run as high as two milliamperes and not be objectionable, before the cells under test are finally removed from the test board.

Since this equipment has been used no trouble has been experienced in balancing either the two of the three-cell type of arresters. The leakage current in either the two or the three-cell types is about the same. The test assures that arresters when installed on the cars are in first-class condition, and experience without such a test has taught the value of knowing that everything is right or else hot cells and minor troubles develop in service.

**Submitted in* ELECTRIC RAILWAY JOURNAL *Prize Contest.*

Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—MISCELLANEOUS—52

Hand Strap Leather Testing Machine*—Continued

shows the load to which the hand strap is subjected.

The strap to be tested is placed on the stud of the spring balance block at one end and the handle of the strap is placed over the lug on the tapped block. To eliminate secondary bending stresses in the handle a wooden block carved to the inner contour of the handle is placed over the lug. This mounting gives a test to the strap and handle as a whole.

When it is desired to test the leather only, a $\frac{5}{16}$ in. steel plate is placed over the lug instead of using the wooden block. The plate has two flanges or ears lined with soft wood against which the top tapered portion of the handle rests. The loop of the handle is free of any other contact with the block.

The machine has not been in use long enough to show the savings effected, but as an index, three used and "rejected" straps were picked at random and tested in both ways described. Nos. 1 and 2, whole straps, did not break when subjected to 250 lb. No. 3, a whole strap, did not break when subjected to 275 lb. The leather of No. 3 was subjected to an additional test of 550 lb. without breaking. This strap had a cracked bakelite handle when removed from service before the test.

Many other uses for the machine have been suggested. By providing suitable clips different materials may be tested, and by providing a scale and an index pointer on each block the extension of the specimen under load may be obtained by taking the difference of the two indices before and during the test.

**Submitted in* ELECTRIC RAILWAY JOURNAL *Prize Contest.*

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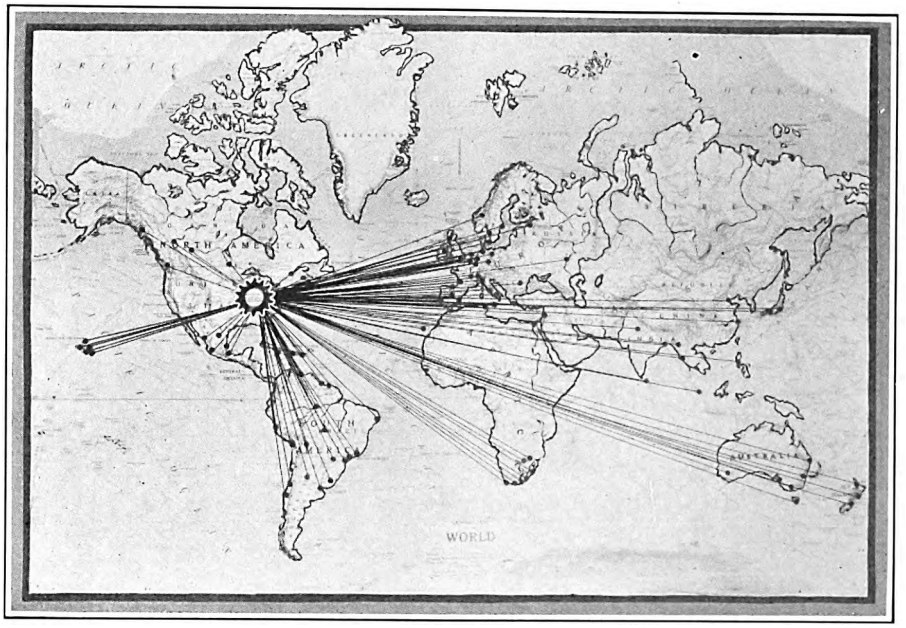

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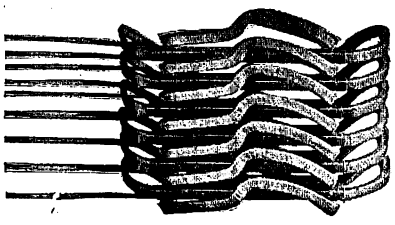

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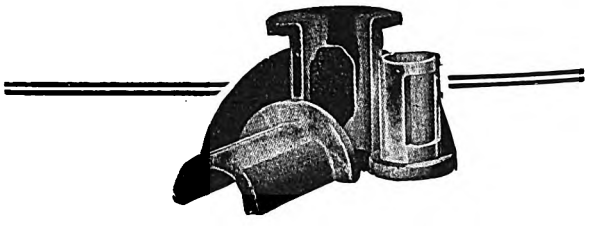

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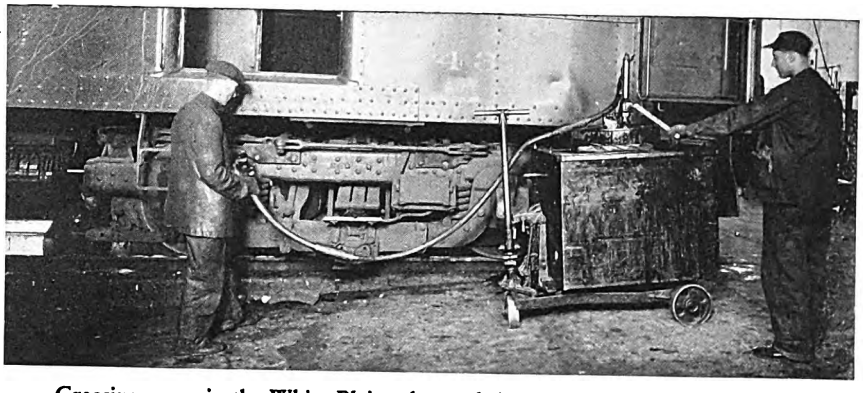
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—32

Convenient Equipment for Pumping Grease to Car Gearing*

By Harvey L. Bullock
General Foreman of Electrical Equipment
New York Central Railroad, White Plains, N. Y.

FOR greasing car gearing, a standard grease pump of the type found in many garages, is used in the White Plains shops of the New York Central Railroad. This is fitted to a special head that will fit over a standard grease drum. The drum with the grease is dropped by a crane into a galvanized iron box, lined with asbestos, which is anchored with expanded metal lath. Electric heaters are provided inside the box, so that the grease can be kept soft. Plugs and receptacles are provided so they can be connected to standard shop circuits. Current is supplied to the electric heaters for one to 1½ hours, and the grease is brought to proper consistency to pump.



Greasing gears in the White Plains shops of the New York Central Railroad by means of special equipment

Each revolution of the pump supplies 1 lb. of grease, and the man who does the greasing and carries the end of a metallic line canvas grease hose, tells the operator the number of turns required to give the desired quantity of grease. The end of the hose is provided with a molasses gate valve, so that the grease flow can be shut off with no drippage. The box into which the grease drum fits is mounted upon a ball bearing truck with a handle so that it can be pulled about the shop readily. A top fits around the drum tightly.

**Submitted in* Electric Railway Journal *Prize Contest.*

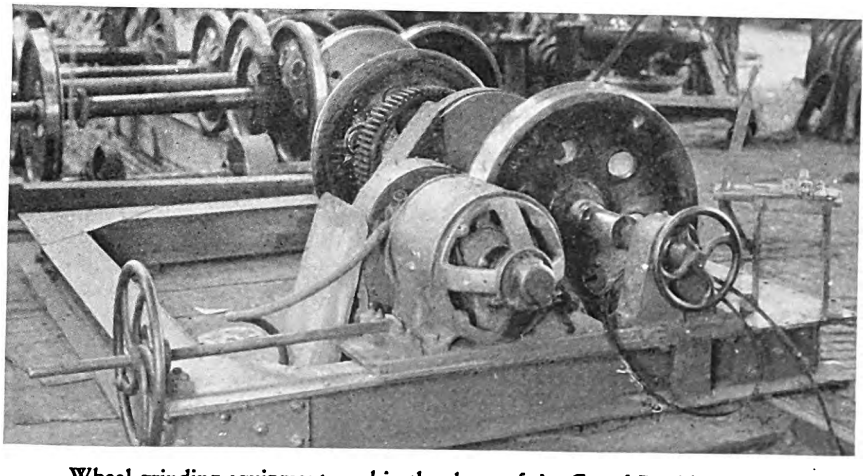
Electric Railway Journal Maintenance Data Sheet

ROLLING STOCK—TRUCKS—34

Simple Type of Wheel Grinder*

By E. M. Lunda
Superintendent of Shops & Equipment
Grand Rapids Railroad,
Grand Rapids, Mich.

FOR grinding wheels while they are mounted on axles, a simple wheel grinding equipment has been made in the shops of the Grand Rapids Railroad, Grand Rapids, Mich. A framework of I-beams is used for supporting the wheels and grinding equipment. The grinder wheel is mounted directly on the shaft of a 3-hp. motor. It is 14 in. diameter and 2½ in. thick. This is the same as the width of the wheel tread. Wheels are revolved at a speed of 65 r.p.m., and the grinder wheel runs at 1,500 r.p.m. To rotate the wheels, a split pulley is bolted to the center of the axle, and this is belted to a countershaft which runs in the pit below. The motor for grinding the wheel is mounted at an angle of 1 to 25, so as to give the proper slope to the tread. The travel of the motor in and out while grinding is regulated by a large handwheel with a screw, the base of the motor sliding back and forth.



Wheel grinding equipment used in the shops of the Grand Rapids Railroad

To keep the grinding wheel true, a hand dresser is used. This is shown at the right corner in the accompanying illustration. When the emery wheel requires dressing, the hand dresser is bolted to the frame and travels across the stone face by pulling the handle of the dresser back and forth. This provides a quick and effective means for truing.

**Submitted in* Electric Railway Journal *Prize Contest.*

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Electric Railway Journal Maintenance Data Sheet

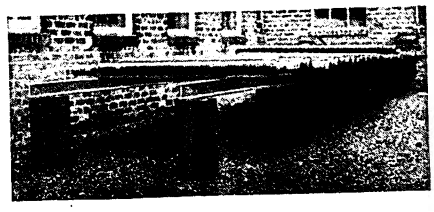
ROLLING STOCK—TRUCKS—33

Special Rack for Storage of Axles*

By C. B. Hall
Chief Clerk Mechanical Department
Virginia Electric & Power Company,
Norfolk, Va.

RESERVE axles of the Virginia Electric & Power Company, Norfolk, Va., are stored on a special rack erected by the mechanical department. Eight pieces of old cross ties were utilized, together with two sections of 100-lb. "T" rail, 30 ft. long. The cross ties are placed in the ground and extend 18 in. above it. The "T" rails are spiked to these supports.

Storage space is provided on the rails for 70 axles. A single axle can be removed without disturbing the others, and this feature is of particular advantage over the arrangement previously used where they were placed in a pile. Since the rack is in the open air all axles are painted before being subjected to exposure.



Rack for storage of spare axles

Submitted in Electric Railway Journal Prize Contest.

Electric Railway Journal Maintenance Data Sheet

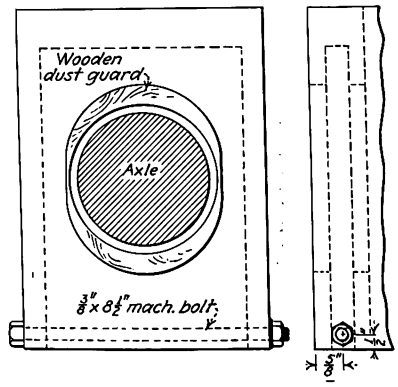
ROLLING STOCK—TRUCKS—35

Holding Dustguards in Position to Prevent Wear*

By Equipment Department
Georgia Power Company, Atlanta, Ga.

TROUBLE has been experienced from wooden dustguards in journal boxes of cars operated by the Georgia Power Company, Atlanta, Ga. The wooden dustguards rest on top of the axle and wear both the axle and the dustguard. This causes an opening at the bottom side of the axle.

To overcome this trouble a $\frac{3}{8}$x8$\frac{1}{2}$-in. machine bolt has been installed in the bottom of journal boxes. Dustguards are slotted, so as to fit over and rest on this bolt. Use of this bolt has also overcome trouble from the dustguard breaking out at the top and letting the guard drop down and extend out at the bottom of the journal box which was an annoying source of trouble.



Back view of journal box showing location of bolt to hold wooden dustguard in position

Submitted in Electric Railway Journal Prize Contest.

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Improvements Suggested for Maintenance Equipment

NUMEROUS suggestions for new tools needed for track and line maintenance were made in the Nov. 17 issue of ELECTRIC RAILWAY JOURNAL, and many more have been received since that time. Some of them are presented here. These suggestions have been made as a result of a campaign for better tools as advocated by the executive committee of the American Electric Railway Engineering Association. The industry has recognized that a higher standard of maintenance is essential, and in order to carry this out economically many improved tools are needed. Experience with present equipment has also shown that much of it is unsatisfactory in certain respects. Prominent men in the industry have recognized this need and are taking this means of calling attention of the manufacturers to needed improvements, in the hope that new equipment will be developed to meet requirements.

ELECTRIC RAILWAY JOURNAL asks that all men who have experienced difficulty in any line of maintenance work send in their suggestions concerning the kind of equipment that would be helpful to them. An outline of improvements that are needed in present equipment and new devices will prove of advantage. By co-operation of the men actually confronted by these problems, the limitations of present shop, track and line maintenance equipment can be brought forcibly to the attention of interested manufacturers. Suggestions will be published in these columns, and maintenance men and manufacturers are invited to enter the discussion. Manufacturers are urged particularly to tell why some of the much-needed tools are not available and to tell how some of these suggestions can be carried out with advantage. Letters are requested from anyone who has suggestions to make regarding needed improvements in existing equipment, or new devices that should be brought out.

Dry Concrete Material Mixer Needed

Suggestions by LOUIS T. BOTTO
Superintendent Maintenance of Way Department, San Antonio Public Service Company, San Antonio, Tex.

TWO years ago the San Antonio Portland Cement Company placed at the disposal of cement users in this section a fully equipped laboratory for free testing of concrete and of concrete-making materials. This service has been used much by our maintenance of way department, and we have found great advantages both in economy and in strength in making concrete by keeping the water content down as low as possible.

Our maintenance of way department has two Smith mixers that are used on all new trackwork where it is possible to keep the traffic off it for fifteen days. On our maintenance jobs, however, it is not always possible to keep traffic off the work and it is often necessary to use concrete with a water content much less than one of water to one of cement. In these instances it is necessary to mix and place the concrete by hand, as it is impossible for the ordinary concrete mixer to discharge this dry mix.

On three major repair jobs during this year, this dry hand-mixed concrete was used exclusively and after being tamped in place was topped with asphalt and the street opened to traffic. One great need of our maintenance of way department is for a concrete mixer designed especially to mix and discharge a concrete mix, containing only sufficient water properly to hydrate the cement in the batch.

A SMALL PAVING MIXER NEEDED FOR RAILWAY WORK

One of the greatest needs of our maintenance of way department is for an inexpensive mixer about the size of an ordinary two-sack concrete mixer, in which hot road oil of about 12 gravity, rock screenings and finely-ground asphalt or other combinations of asphalt and stone may be mixed thoroughly and from which the material can be discharged readily. For the past three years we have been mixing by hand in different combinations these materials for use in our regular paving maintenance work, and have effected a considerable saving over maintenance methods previously used to do this.

Our company has 250,000 sq.yd. of paving to look after and keep in good condition. As this paving becomes older it requires more and more attention. We do not feel that the amount of work which we have to do justifies our department in asking for an expensive paving plant, but we do believe that a suitable, inexpensive paving mixer would be very desirable and that it would pay for itself in a short time.

COME-ALONG CLAMP NEEDED FOR JOINT WELDING

Three years ago the San Antonio Public Service Company began a six-year program of seam welding and reinforcing rail joints of 60-lb. A.S.C.E. rail in gravel ballast track. The aim was to recondition from 4 to 6 miles of the 30 miles of this type of track each year until the entire work was completed. The type of joint used in this work was shown in the issue of ELECTRIC RAILWAY JOURNAL for Aug. 20, 1927. This work has gone forward as planned, and we have at this time 13.9 miles yet to be done.

In connection with the welding of these joints a new device is needed. This should provide for gripping the base or web of the rails on each side of the joint, and for pulling them together tightly while the welding is in progress.

Mr. Manufacturer

Have you any equipment that can be adopted to the needs outlined on these pages?

SEND IN YOUR COMMENTS

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The use of such a device will also permit cars to pass over the track while the welding is being done. Such a device should be of light weight, strong and arranged so that it can be applied and removed easily and quickly, and by one man. We have designed and tried out several different kinds of come-along clamps, but none has proved entirely satisfactory.

With this class of construction work tracks are opened up and new ties are put in where needed. New ties are placed on 10-ft. centers, and the tracks aligned and resurfaced. Where rails are worn badly they are renewed. While this work is in progress the welders follow the track gang and weld the joints. The great advantage of having a satisfactory come-along clamp is to have the welding crew do all of the welding work, without the necessity of calling upon the track gang to come back and make the joints tight for the welders. A suitable device of this kind would speed up the work and insure better joints.

Equipment Department Lacks Improved Fixtures

Suggestions by H. S. WILLIAMS
Assistant Superintendent of Equipment Department of Street Railways, City of Detroit, Mich.

IN THE equipment department of electric railways workmen are under a great handicap due to lack of devices for holding and clamping parts in position during machining operations. There appears to be particular need for a line of air clamping devices which will hold work in drill press operations. Inasmuch as the maintenance shop has such a large proportion of drilling operations to perform, and these must be carried out on odd-shaped pieces in small quantities, there is no possibility of speeding up production by the use of jigs and fixtures. Quick operating devices and clamps are needed badly.

UNIVERSAL LINE REAMING MACHINE SHOULD BE DEVELOPED

It has been established that greater life may be obtained from armature and axle bearings of railway motors if adequate bearing preparation is used. This work necessitates a reduction of clearances to the minimum in the original fitting, and this in turn means true shaft bearings and liners which are machined in true alignment. It is believed that a universal line reaming machine can be developed which will function to line-ream the bearings of motors and so give them proper fitting.

MANY IMPROVEMENTS NEEDED THAT WILL REDUCE CAR NOISE

As to car equipment, the needs in this line are multitudinous. A few items can be suggested of outstanding importance. In connection with assistance needed in the campaign for noise reduction, the noise reduction committee of the American Electric Railway Engineering Association last year suggested that gear cases be covered with a sound-proofing material. Tests conducted showed that by doing so a great percentage of the total car noise could be eliminated. The commercialization of this feature should be pushed forward.

There is also a need for sound insulating material to absorb sounds reflected from the pavement into the car. Manufacture of such material will be of advantage.

Gear cases which will retain the oil lubrication better than present types are urgently needed. Railway gears as manufactured are notoriously incorrect, and much improvement is needed along lines outlined by the noise reduction committee.

> New equipment must be developed to provide and to maintain the improved service and comforts that the people demand.
>
> FRANK H. MILLER
> *President American Electric Railway Engineering Association*

More Permanent Overhead Needed

Suggestions by ANGUS G. SCOTT
Assistant Superintendent of Overhead, Cleveland Railway

AT THE present time the electric railway industry does not possess a stable overhead construction but one which requires frequent tearing down and rebuilding. An ideal type would be one which would, in a sense, be permanent. Suggestions on methods, tools and devices tending to establish permanent overhead construction would be of much value.

The use of non-ferrous wire and materials is a step in this direction. However, many parts of the overhead system which are now subject to wear, such as ears and splicers, crossing facilities, etc., can be developed further into units easily replaced which would cut maintenance costs considerably.

In the overhead department there is a broad field for the further development of present maintenance devices and for the invention of new tools, new equipment and methods. Hand labor, which plays a very prominent part in every overhead plant, can be cut down through the use and development of mechanical devices, such as span wire clamps, which eliminate the necessity of serving wire by hand. The assembling of the plant, which is now largely done in the field, could be done in the shop through new methods and tools.

At present, much overhead material by no means worn out is scrapped. Through the designing and use of the proper apparatus, this material could be reclaimed at a small cost. Such items as ears and splicers are in this class.

> **Maintenance Men:**
>
> Tell us the particular problems that you meet where new equipment or improvements on present devices will be of advantage.

Clamping Trolley Ears Around Trolley Wire

Suggestion by JAMES F. NEILD
Electrical Engineer Toronto Transportation Commission

ONE of the specific needs of overhead departments of electric railways today is for a device for clamping trolley ears around the trolley wire. This can be accomplished either by pressing or rolling, so as to obtain a smooth underrun and eliminate the ridging caused by peening the ear onto the wire with a hammer. No matter how carefully an ear is peened on, ridges are left and these tend to set up vibration. The elimination of these will be a direct contribution to the industry.

Universal Boring Machine for Bearings

Suggestion by J. T. PORTER
Superintendent of Equipment Virginia Electric & Power Company, Richmond, Va.

THE Richmond shops of the Virginia Electric & Power Company are in need of a universal boring machine for boring out armature and axle bearings. The machine now in use has been in service around 35 years. While it takes care of the work after a fashion, it has become worn and cannot be depended upon to do accurate work. Repair parts for this machine are not available, and we cannot find a manufacturer who makes a boring machine which will do the work that this particular machine was designed to do.

There is an urgent need for such a machine on many electric railway properties. I have talked to several manufacturers and representatives about this condition, but as yet no one has come forward with a machine that will meet the need. It would certainly be a god-send to the industry if some manufacturer would produce a suitable bearing boring machine.

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SHORT CUTS

for the Electrical Repair Room

Peculiar Effect of Miscounting Armature Lead-Spread

IN A four-pole, series-connected, armature with 15 bars and 15 coils, it is possible to divide the commutator bars and coils into three sections insulated from each other, by miscounting the lead-spread. The proper bar to which the number 1 bar should be

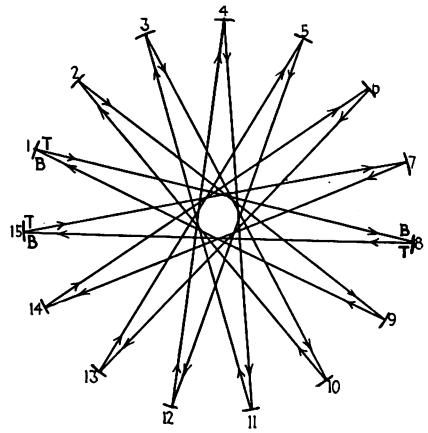

Fig. 1—Armature with 15 bars and coils, correctly connected

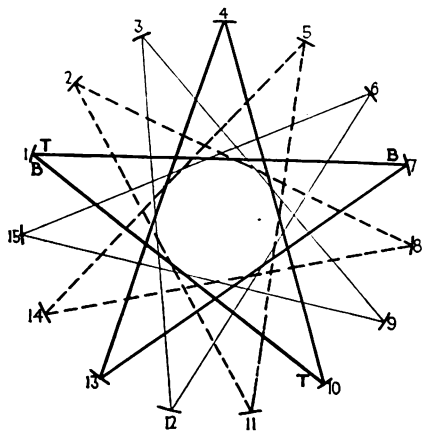

Fig. 2—Counting "one short" divides the commutator bars and coils into three sections, insulated from each other

connected is determined by a definite rule. Should the lead-spread be counted short, the three insulated sections will result.

In Fig. 1 is shown a 15 bar and 15 coil armature, correctly connected. As may be seen, each coil is connected to the one adjacent to it, through two coils in series, the bar joining these two being diametrically opposite the two adjacent bars. With the bars connected in this manner all around the armature, two parallel paths result. The correct spread of the leads of any coil is obtained by dividing the total number of bars by 2 and adding one-half or 1½, depending on the direction of rotation of the armature.

With a 15-bar armature the lead-spread would be either 8 or 9. Fig. 2 shows an armature with its first bottom lead connected to bar 7, instead of to bar 8 or 9, with the result that the bars and coils are divided into three sections insulated from each other. This mistake is called "counting one short." "Counting one over," will produce the same result.

Position of Winding Machine or Operator Affects Field Coil Polarity

FIELD coils that give reverse polarity when connected in the usual manner are said to be wound left-handed. Strictly interpreted, however, this expression is not true for it is not practicable to wind a field coil left-handed. The winding spindle would have to be turned toward the winder instead of from him, and the wire from the stock reel would have to pass under the winding form instead of over it. Also, the winder would be unable to guide the wire and wedge the turns into place unless he assumed an uncomfortable position.

It is not uncommon for winders of field coils to become confused with the method of winding when a new machine is substituted for an old one. To cite an example of this, a field coil winder had become accustomed to sit with an old machine to his right when winding coils. The operator became much confused in using a new machine, the construction and installation of which required that the winder sit at its right. The direction of rotation was the same for both machines, but this added to the delusion. All winding forms have either a hole or a slot through the flange on one side for securing the starting end of the winding. This, too, causes the winder to become confused, because he is almost certain to use the hole or slot already in the form.

To illustrate the difference, the winding *A* in Fig. 1 has been started on the right-hand side of the form, while the winding *B* has been started on the left-hand side. Viewing the starting side of the form as indicated in the diagram and conceiving current to enter the coil by way of the starting end, it will be seen that the current flow in the coil of *A* will be clockwise while that in the coil of *B* will be counter-clockwise.

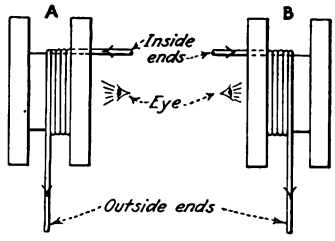

Fig. 1—Two positions of winding forms

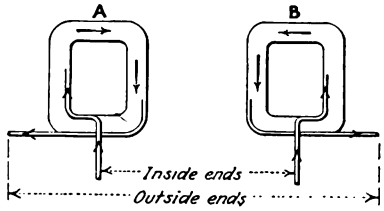

Fig. 2—Two coils removed from the winding forms showing the slight difference in appearance though wound from opposite ends

The appearance of the coils when removed from the form will be the same to the casual observer. The similarity of appearance is emphasized in Fig. 2, which shows the two coils when removed from the form. Unless trouble has been suspected, the error will not be detected and the coils will be insulated in the usual manner. When insulated, they will appear exactly the same, but this does not correct the effect of the reversed winding, namely, reversed polarity. To avoid this trouble when a machine that requires the operator to sit on the opposite side is installed, it is necessary to cut slots or holes in the opposite flanges of all winding forms.

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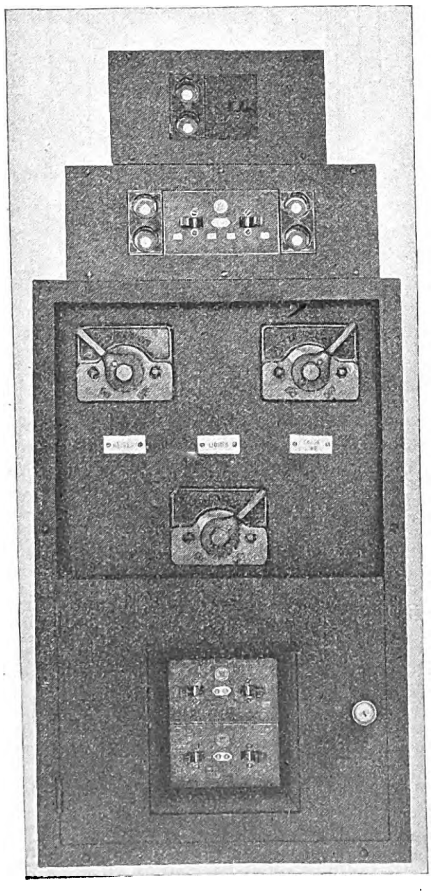
New Offerings of Useful Equipment

Safety Panelboards for Electric Cars

DURING the last year the Westinghouse Electric & Manufacturing Company has developed a new line of panelboards for controlling the lighting systems of electric and steam railroad cars. Full safety type panelboards place the entire control under the supervision of the operator, since they are so compact they can be mounted within easy access.



Panelboard for city or interurban cars

These panelboards were designed not only to provide safety for subway, elevated and steam railroad cars, but also to give the railways a lighting and power control panelboard that is flexible enough to meet all conditions. All mechanisms form individual units so that any one unit can be removed without disturbing the others. The compartments are arranged so that, where necessary, barriers are provided between all live parts.

The trims are made with two doors, one over the fuses and one over the switches. Each door requires a separate key which permits only authorized persons to gain access to the compartments. Trims are furnished in any color to match the interior finish of car.

Across-the-Line Reversing Switch

DEVELOPMENT of a new motor control switch suitable for reversing small alternating-current motors in cases where the motor can be thrown across the line is announced by the General Electric Company, Schenectady, N. Y. It consists of two triple-pole, barrier-type, magnetically-operated contactors, mechanically and electrically interlocked, and two hand-reset temperature overload relays mounted on a molded base and enclosed in a drawn-shell enclosing case.

Double-break contactors with silver contacts, operated by a high-speed solenoid, give the switch a very high interrupting capacity with minimum arcing. The new type silver contacts eliminate the need for the shunt straps and, since silver oxide is a conductor, minimize contact resistance.

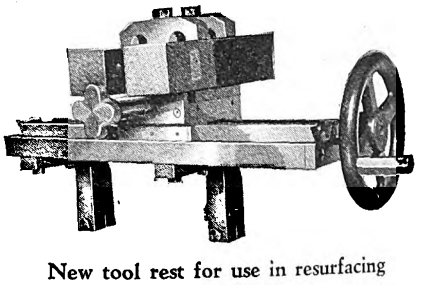
Two temperature overload relays protect the motor from overheating because of mechanical overload or single-phase operation. These relays are a fixed part of the switch, but have interchangeable heaters. To adapt this switch for use with a motor of a different rating but the same voltage, it is merely necessary to select heaters corresponding to the motor current.

The enclosing case, finished in black water Japan varnish, has rounded edges and corners which give it a neat appearance. The cover is held in place by two pins at the top, and by a screw at the bottom. Additional clips can be supplied to permit the use of a padlock.

Many applications, such as motor-operated doors and windows, valves and machine tools, require a reversing switch, a push-button and either a geared-type or track-type limit switch. The size and appearance of the new switch are such that it can be mounted readily on any machine for use with any of these applications.

Tool Rest Improves Commutator Grinding

TO INSURE a more nearly perfect job when using Ideal commutator resurfacers, the Ideal Commutator Dresser Company, Sycamore, Ill., has just placed on the market a new tool rest. This attaches to the brush arm and results in a great saving of time in commutator grinding, as it eliminates the necessity of dismantling motors and generators in order to resurface the commutators.



New tool rest for use in resurfacing commutators

Bases for the tool rests are available in lengths from 6 to 28 in., varying by 2 in. Those 14 in. or smaller have two supports while the 16 in. or longer bases have three supports. The supports are L-shaped, either 2 in. or 3 in. high, or T-shaped 3 in. high for attaching to round brush arms. Flat supports can be substituted when necessary to attach to flat brush arms. Each base has a large diameter wheel to facilitate easy operation of the cross feed, also a screw-infeed adjustment.

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News of the Industry

Ten Cents in Rochester

Cash fare on the Rochester lines of the New York State Railways will be increased to 10 cents on Jan. 1, according to an announcement of James F. Hamilton, president of the company. The present fare is 9 cents. Car tickets will be sold at the present rate of twelve for $1. Thus only the casual rider who does not purchase tickets will be affected by the raise.

Under the terms of the service-at-cost contract with the city, the railway is allowed a 6 per cent return on its investment. The surplus goes into a balancing account fund. The contract stipulates that when the balancing account reaches $500,000, the fare is to be automatically reduced and when it goes below $200,000, the fare is raised. The balancing account, $300,000, was created in 1920 when the service-at-cost contract went into effect. The balancing account now shows a deficit of $80,000. The contract expired in August, 1930. If the increase in fare brings the balancing account up to $500,000 before Aug. 1, 1930, the fare will be automatically returned to 9 cents, Mr. Hamilton pointed out.

The fare was raised from 8 to 9 cents last December and from 7 to 8 cents in January, 1926.

Cash fare is 10 cents on the other properties of the New York State Railways in Syracuse and Utica.

Five-Cent Shuttle Discontinued in Seattle

Seattle's shuttle system, that in the vernacular "ran rings" around the business district from Yesler Way to Olive Way for the benefit of short-haul shoppers, has been discontinued by the Municipal Railway, whose sponsors said it was a losing business. The fare was 5 cents with no transfers, but the route was confined to a comparatively small district. One-man cars were used. The service, started on Nov. 7, 1927, was described and illustrated in an article in the JOURNAL for Feb. 11, 1928, page 253.

Rapid Transit Survey to Start Soon in St. Louis

Rudolph E. Kelker, Jr., Chicago, who has been retained as engineer for the Rapid Transit Survey Commission of St. Louis, Mo., visited St. Louis on Nov. 30 to confer with city officials and members of the commission. He will begin active preliminary work at once, after which he will outline for the commission his complete program of procedure. Actual field work will not be undertaken for several months. He said the city should first find out what it wants to spend money for and then spend it wisely. He stressed the necessity for a reasonable fare and the assurance of continued use of rapid transit facilities after they are constructed. He pointed to the St. Louis Public Service Company as a "probable tenant." Mr. Kelker said that subways should be built only where it is absolutely imperative. His opinion is that elevated lines can be made both sightly and comparatively noiseless.

Automobile Men See Parking Need

New York merchants suggest reasonable parking restrictions with policing regulations based on experience in Central West, particularly Chicago

MAYOR WALKER of New York has before him a report of the traffic committee of the Automobile Merchants Association of New York, making fourteen concrete suggestions for the improvement of traffic in New York City as follows:

1. Secure the necessary amendments to the building code and zoning laws to permit the erection of parking garages.
2. Follow the example of the city authorities of Chicago by providing ample parking space before drastic non-parking regulations be adopted.
3. Compel all sight-seeing buses to vacate streets immediately and occupy terminals.
4. Skip-stops for all surface cars and city-type buses.
5. Require all buildings above a certain height or tenant capacity either to provide garage facilities in lower floors or core of building.
6. Progressive control light system of traffic signals throughout the city.
7. Traffic light suspended in center at street intersections.
8. Install stop-street signs wherever required.
9. Permit driving through the safety zones.
10. Compel all slow-moving vehicles to keep well to the right.
11. Issue summons to pedestrians disregarding traffic signals and make it unlawful for any pedestrian to cross a roadway other than with released traffic, wherever traffic is directed by a police officer.
12. Hasten completion of express highway and provide parking facilities thereunder.
13. Hasten alterations on Queensboro Bridge in order that the movement of traffic at that point be expedited, and rush condemnation proceedings with respect to property required at western end so that the bridge has adequate approaches.
14. We believe the Police Department is doing splended work. We recommend that our traffic courts be reorganized, using as models the Traffic Violations Bureau of Detroit, the Chicago Traffic Bureau and the Los Angeles Traffic Violations Bureau.

In its letter to Mayor Walker, the committee suggested that its report be turned over to the engineering firm of Day & Zimmermann, which has been suggested to the Board of Estimate for retention to make a traffic survey of New York City. The committee believes that "the citizens of New York are looking for some kind of traffic relief as soon as it is humanly possible to accomplish it." The committee says:

We were fortunate in meeting Dr. Miller McClintock, who was employed by the Chicago Association of Commerce to make the original traffic survey and upon whose recommendations the ordinance is predicated. Dr. McClintock stated that he was quite familiar with the New York traffic situation, but did not desire to make a survey thereof unless he were assured that the city authorities were ready and willing to proceed with a definite plan of traffic relief immediately after such survey had been completed. We believe that steps should be taken to obtain the services of Dr. McClintock in order that a satisfactory solution of our local traffic problem be achieved.

The rapid movement of traffic on main highways in Chicago was of especial interest, particularly along such main thoroughfares as Michigan Boulevard, Lake Shore Drive, Lief Ericksen Boulevard, made possible by virtue of the following:

1. Thirty-five miles per hour on boulevards and main thoroughfares.
2. Twenty-five miles per hour through the Loop district.
3. Stop streets at intersections at main thoroughfares indicated by large stop signs.
4. Right hand turns permitted.
5. Left hand turns permitted against a red light at every other block under police direction.
6. Progressive system of traffic control on intermediate traffic lanes.

In Chicago the number of arrests for traffic violations is low, even though the fines are nominal. For example, they range for minor infractions from $1, $2 and $5 for the first, second and third

20,000 New York Taxis Have $160,000,000 Income

A. Freed, president of the Paramount Cab Manufacturing Corporation, estimates that 20,000 cabs of New York's taxi fleet have a yearly income of $160,000,000. Mr. Freed pointed out that for every $1 spent on subway, elevated lines and trolley lines for fare, $1.02 is spent for taxi transportation.

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offenses respectively. General observations and conversations with police officers indicated to us that the Police Department was experiencing very little difficulty in connection with enforcement of the ordinance. Parking is permitted in the Loop after 6:30 p.m.

In conclusion, the committee believes that non-parking effective from 7:30 a.m. until 6:30 p.m. in the Loop, is a decided benefit to the city of Chicago.

Traffic Problems Discussed

Comprehensive reports on many phases of the traffic problem as it exists today were presented and discussed at the tenth annual meeting of the National Highway Traffic Association held Dec. 10-12 at the Automobile Club of America, New York City. Of particular interest to electric railway men was the report of the committee on traffic control on car tracks and adjacent to safety zones, of which E. J. McIlraith was chairman. The recommendation was made that the construction of the safety zones should provide a slightly raised area 4 ft. wide and extending a few feet more than the length of the longest car to be used in the zones, or the length required for two cars if a double-loading berth is to be used. The nearest side of the zone should be 30 to 32 in. from the gage line of the rail. The zone ends should be protected by a bumper of a type which will stop an automobile or deflect it sidewise without causing as much damage to the vehicle as would be the case if it were stopped by very heavy pipes set vertically in the pavement. The zone end should be thoroughly illuminated by floodlighting, and by two yellow flashing lights set about the height of the tail light of an automobile and pointed toward on-coming traffic. It was further recommended that alongside the curb, opposite safety zones and for a distance of at least 25 ft. beyond the end of the safety zone, parking should be prohibited.

The only object to be accomplished by prohibiting driving to the left of the safety zone, the committee pointed out, would be to avoid unnecessary interference to street cars.

Elimination of automobile parking was discussed in a report of the committee on parking regulations, of which Prof. Roger L. Morrison was chairman, and also in a talk on problems of efficient street use by vehicles and pedestrians, by Dr. Miller McClintock.

Pedestrian control was the subject of a report of a committee of which Prof. Lewis M. McIntyre is chairman. It was the consensus of opinion that pedestrian control is desirable, but it was generally admitted that enforcement is extremely difficult.

Reports were presented also on numerous subjects dealing with general phases of highway traffic, including economics, safety, insurance and terminology. A considerable number of electric railway men were present at the meeting and participated in the discussion about mass transportation.

No More Jitneys

Detroit Council passes measure that would rule them out forever. Corporation Counsel approves move

IN ANSWER to the proposal that the jitneys which were ousted from the main thoroughfares of Detroit, Mich., by the recent Supreme Court decision, be rented to the city at $1 a day each, the City Council passed an ordinance to prohibit the operation of so-called jitneys, on the streets, avenues, boulevards and public places of Detroit. This measure provides against the operation of jitneys on any city street or any thoroughfare mentioned in the original ordinance, the validity of which was finally established after six years of court action involving the jitneys and the city.

A letter from the corporation counsel, Clarence E. Wilcox, presented to the Council, cited that since the decision of the Michigan Supreme Court in the jitney litigation, 45 separate petitions were filed with the Mayor seeking permission to operate jitneys on some of the streets covered under the old ordinance. The number of individual applications involved was close to 11,000. For the most part these jitneys would all converge in the center of the city and contemplated the use of loading stations in the congested areas.

This, of course, would create a condition similar to the one found objectionable before, he pointed out. The requested routes were for the most part on streets already served by street cars or buses. He further expressed the opinion that the city should take a definite stand on these applications, and not leave to litigation the matter of how many privately-owned jitneys should operate or the streets they should use. He said the question was "whether or not further operation of jitneys is desired in the City of Detroit." He said:

> The granting of licenses or permits to a large number of independent organizations or individuals would render adequate protection to the traveling public impossible. No form of insurance protecting property or personal damage would be possible or practicable. No regulated or prescribed schedule could be enforced. Privileged tax based on mileage would be almost impossible to ascertain.

The new ordinance was presented to the Council simultaneously with Mr. Wilcox's letter, and passed its first and second readings at once. It was finally passed at the next regular meeting.

Aviation Discussed at New York Railroad Club Meeting

More than 3,000 persons attended the annual dinner of the New York Railroad Club at the Hotel Commodore, New York, on Dec. 13. It was "A Merrie Christmas" as the program and seating list said. It was particularly merry for W. G. Gove, superintendent of shops of the Brooklyn & Manhattan Transit Corporation, who was presented a watch, and for J. S. Doyle, assistant general manager of the Interborough Rapid Transit Company, who received an autographed album as a testimonial for his work in behalf of the club. But enthusiasm for this part of the program must not be permitted to becloud the fact that the addresses were all concerned with transportation of the future. President Eliot Sumner presided. George Le Boutillier, vice-president of the Pennsylvania Railroad, was the toastmaster. Between Mr. Le Boutillier and Count Ernesto Russo, who discussed "America As I Find It," the diners were certainly kept amused. When a foreigner finds America it usually is funny. Even the Indians thought so in Columbus' time. Count Russo brandished no tomahawk, but he did some verbal scalping. He preserved his disguise until the last. The hilarity of the evening was tempered with the addresses: "What the Air-Rail Business Means," by C. M. Keys, president of the Transcontinental Air Transports, Inc.; "America's Transportation of the Future," by Elisha Lee, vice-president of the Pennsylvania Railroad; "Comments on the Airship Situation," by Commander Charles E. Rosendahl, U. S. S. Dirigible Los Angeles, also naval observer on the Graf Zeppelin; "The Co-ordination of Air and Rail Transportation," by Charles M. Paulding, vice-president in charge of public relations of the New York Central Lines.

Useful Pamphlet Issued in Erie

A transportation folder of the City of Erie, Pa., is being distributed this month by the Erie Railways and Erie Coach Company. It contains schedules of street cars and coaches and other information regarding the city's transportation facilities.

New Parking Ordinance in Chicago

Automobile parking on North Michigan Avenue, between Randolph and Oak Streets, Chicago, except for 30 minute periods between 11 a.m. and 4 p.m. is prohibited under a new city ordinance which became effective on Dec. 7. No-parking restrictions have been in effect on Michigan Avenue south of Randolph Street and on streets in the "loop" district for nearly a year.

The new regulation makes possible eight full lines of moving traffic, thereby increasing by approximately 40 per cent the capacity of this important north and south boulevard. A two-day test of the new order showed a remarkable acceleration of traffic to and from the "loop" district at the southern end of the restricted zone, according to the police department. Movement of traffic on this thoroughfare had been further expedited by the recent installation of a progressive signal light system.

Witnessing the immediate relief from congestion the West Chicago Park commissioners passed an ordinance prohibiting parking on the principal west side thoroughfares, and on Oakley and Sacramento Boulevards.

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Is the Subsidy Coming?

There is no secret as to what is happening to street railways. Increasing use of automobiles has cut seriously into their revenues, while congestion of the streets, which is becoming worse and worse, presents immense obstacles to efficient and economical operation. The matter is becoming one of profound importance to the general public, involving the growth and progress and well-being of our cities. Students of the subject, not themselves interested in the business, are predicting the possibility that municipalities will be compelled to contribute to the support of street railways. The suggestion of such a policy emphasizes the gravity of the problem.—*Baltimore Sun.*

Higher Rates Effective in Illinois

The Illinois Commerce Commission on Nov. 27 vacated previous orders of suspension and announced that car and bus rates in several cities served by the Illinois Power & Light Company will be increased at once to 10 cents with three rides for a quarter, from 7 cents with four rides for a quarter. The commission had suspended the increases until May 24, but that delay is now set aside. The cities affected are: Jacksonville, Danville, Galesburg, Quincy, Bloomington, Normal and Decatur.

Mayor O. W. Smith of Decatur, Ill., has suggested that the city enter the bus transit business in order to bring about lower fares on the lines of the Illinois Power & Light Company. Mayor Smith would charge only 6 cents on the city-owned buses.

Just for Maine's School Children

The Biddeford & Saco Street Railway began operations on Dec. 7 between City Square, Biddeford, Me., and Granite District, a suburb of Biddeford. This line was abandoned several months ago after repeated attempts to put the line on a paying basis. Service is being reestablished solely for the benefit of school children and comes after an arrangement between the Biddeford Board of Education and officials of the railway. Permission was secured from the Maine Public Utilities Commission. One trip will take the children to school at 8:10 a.m. and another will bring them home at 4:05 p.m. The line is believed to be the only one in the country operated solely for school children.

T. H. Tutwiler Honored

T. H. Tutwiler, president of the Memphis Street Railway and the Memphis Power & Light Company, Memphis, Tenn., was recommended as a member of the board of directors and the executive committee of the Southwestern University. Mr. Tutwiler has consented to serve.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Jan. 4, 1929—Metropolitan Section, American Electric Railway Association, 33 W. 39th St., New York, N.Y.

Jan. 14-18—American Road Builders' Association, convention and road show, Cleveland, Ohio.

Jan. 15-16—Kentucky Association of Public Utilities, annual meeting, Brown Hotel, Louisville, Ky.

Jan. 22—New York Electric Railway Association, mid-winter meeting and dinner, Hotel Commodore, New York, N. Y.

Jan. 23-25—Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.

Jan. 24-25—Central Electric Railway Association, Claypool Hotel, Indianapolis, Ind.

Jan. 25-26—Central Electric Railway Accountants' Association, Claypool Hotel, Indianapolis, Ind.

Jan. 28-Feb. 1—American Institute of Electrical Engineers, annual convention, 33 W. 39th St., New York, N. Y.

Feb. 7-8—Midwest Electric Railway Association, Midwinter meeting, Robideaux Hotel, St. Joseph, Mo.

Feb. 14—Central Electric Railway Master Mechanics' Association, Youngstown, Ohio.

Sept. 28-Oct. 4—American Electric Railway Association, 48th annual convention and exhibit, New Public Auditorium, Atlantic City, N. J.

Ready to Serve as Mediators in Chicago

The committee of five citizens appointed by Federal Judge James H. Wilkerson, as a traction settlement committee to co-operate with city officials and railway companies in agreeing upon a new franchise for Chicago, is awaiting endorsement of the movement by the City Council. The Council has refused to suspend the rules to consider approval of the commission.

Judge Wilkerson, in whose court is pending the receivership of the Chicago Railways, representing 60 per cent of the Chicago Surface Lines, appointed the commission in the hope that it could determine on a plan for settlement and legislation necessary to obtain from the General Assembly, and get the approval of the city and companies.

Federal Judge James H. Wilkerson is expected to rule within the next few days on the request of the receivers of the Chicago Railways for permission to purchase 60 new cars. If permission of the court is obtained by the receivers for these cars, it is thought likely that the Chicago City Railway, the remainder of the Surface Lines property, will also agree to purchase 40 cars, making a total of 100 for the system. The management wants to purchase cars with front entrance and central exit seating 61 passengers.

Beside Mr. Simpson, who is chairman, the other members of the citizen's committee are: Col. A. A. Sprague, former commissioner of public works; Joseph R. Noel, a Chicago banker, John A Carroll, local real estate operator, and Charles M. Thompson, dean of the College of Commerce of the University of Illinois.

In announcing the new committee, Judge Wilkerson explained that it would not supplant the City Council's transit committee nor would it attempt to speak for the companies. Instead, the committee will probably start considering the ordinance drafted last summer by the Aldermen and upon which negotiations are now being based. It will undertake to smooth out the differences which have frequently created deadlocks in the dealings between the Aldermen and the companies' representatives, by suggesting compromise that would be fair both to the city and the security holders.

Terms of the new ordinance upon which the city and companies are not yet in agreement are the rate of return and powers of the proposed local transit commission. Another important issue which is now under discussion at the joint meetings of the transportation subcommittee and company representatives is that of surface lines extensions. The present draft of the proposed franchise carries a provision which would retain to the city the power to compel the building of extensions. The Aldermen insist that a fund of $135,000,000 should be set aside definitely to take care of extensions during the first ten years of operation under the new franchise. The companies contend that a provision of this kind is unnecessary, in view of the fact that a local transit commission would have mandatory control over the new company's operations and service.

Assistant Corporation Counsel Frederick Bangs recently said to the Aldermen that no legal referendum could be held until the next general election in November, 1929. Because of the opinion it is expected that legislation conferring this authority will be asked in the enabling bills to be presented to the General Assembly next month.

Skip Stop on Albany Line

The United Traction Company, Albany, N. Y., put into effect on Dec. 1, the alternate skip-stop system on its Broadway line. If successful on this route, it is anticipated the system will be extended by the company to other divisions.

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More One-Man Cars Authorized for Key System

Under authorization of a decision issued Nov. 30 by the California State Railroad Commission, the Key System Transit Company, Oakland, will start extension of one-man street car operation on lines throughout the east bay cities of Alameda and Contra Costa counties as quickly as is "found feasible."

The order is in direct opposition to recent action taken by the Oakland City Council. It was issued in response to an application for the installation of one-man operation made by the Key System recently. The commission's decision reads in part as follows:

It is hereby ordered that applicant be authorized and directed to operate one-man cars on all its traction division lines in the Counties of Alameda and Contra Costa, State of California, except local street cars operated upon and along each of the three following lines, which are primarily devoted to transbay service:

Piedmont Avenue line from 40th and San Pablo Avenue to 41st and Piedmont Avenue.

Berkeley line from 40th and San Pablo Avenue to Ward and Shattuck Avenue.

Sacramento Street line from 40th and San Pablo Avenue to Northbrae, subject to the following conditions:

Said one-man operation shall be installed on the respective lines of applicant as and when applicant shall be financially able to install such operation.

The commission found it to be the fact that street cars with one man can be safely operated on all of the traction division lines of the applicant; that such operation would be adequate and would fully meet the convenience and necessity of the traveling public in all of the communities served, and would result in more economical service and operation than is now being performed.

President Lundberg declared that the company had done its utmost to carry out the pledge made at the time of the 7-cent fare decision, and to meet the recommendations of the commission along the lines of introducing "every possible economy in its operation."

Explanation of Electrification Situation by Long Island

In a letter recently sent to the Glen Cove Chamber of Commerce on the matter of the electrification of the Oyster Bay Branch of the Long Island Railroad, George Le Boutillier, vice-president, states that the subject has been studied with the idea of deciding whether or not operating economies could be effected. Studies showed a discouraging prospect—an expenditure of $2,150,000 for electrical construction and $1,130,000 for equipment. This total would produce an operation saving of only 3.9 per cent, or 1.1 per cent less than the interest charges on the new capital required. It would seem unwise, he maintained, to entertain the hope that immediate growth of the territory in response to electrification would materially increase the gross earnings of the branch.

In conclusion, Mr. Le Boutillier said:

As you are undoubtedly aware, this company endeavored for several years before the regulatory bodies, without success, to secure an increase in commutation rates in order to have sufficient surplus to make just such improvements as you are requesting. In the absence of this much needed revenue, we are forced to make our expenditures along the lines before mentioned, and regret that we cannot at this time consider those improvements which might be expected to improve our service.

New Deal Proposed in Canton

Tentative contract covers operation for ten years. Ten-cent cash fare with five tokens for 35 cents suggested against present 6-cent cash fare with six tokens for 35 cents

THE Transportation Commission which has been making a study of the transportation needs in Canton, Ohio, for the last six months, with a view to preparing a franchise to be submitted to the City Council, has completed its work and drawn a tentative contract covering future transportation in Canton for a period of ten years. For convenience, and to localize the operation, it is proposed to set up a new company to be known as the Canton Railway & Transportation Company, a wholly-owned subsidiary of the Northern Ohio Power & Light Company. To this company a contract will be awarded for all mass transportation in Canton. The tentative ordinance provides:

1. A 10-cent cash fare, five tokens 35 cents, school tickets 5 cents. Free transfers.
2. A ten-year contract with arbitration periods for readjustment.
3. A transportation commission of five men with an advisory commissioner.
4. Arbitration for all disputed points.
5. Commission control of service.
6. Complete operation of all bus and rail service.
7. Modern type of cars and buses.
8. Right to operate freight, express and interurban cars.
9. Establishment of a shelter house in Public Square.
10. Company to keep paving between tracks in good condition. Paving made necessary by new construction to be done as determined by commission.
11. Provision made for purchase of property by the city.
12. Provision made for purchase by operating company of independent bus lines.
13. Penalty clause for failure to obey commission orders.
14. Name of company to be known as Canton Railway & Transportation Company.

Conferences among the commission, City Council and Mayor have begun looking toward possible revision and adoption of the proposed franchise.

One of the principal features of the proposed new franchise is the setting up of a transportation commission consisting of five members who shall be selected jointly, for the term of the ordinance, by the City Council and the company. Members of the commission shall be residential electors of the city. No member of the commission shall be an officer or employee of the city, nor shall have been within the last three years preceding his selection to the commission, and no employee, shareholder or director of the company within the same period be eligible to membership. This is to keep the commission free of all political and other influence.

The commission is empowered to regulate transportation service, including the right and power to require the company to provide additional facilities and service on existing railway and bus lines, and to establish additional bus service in territory not already served.

A Transportation Commissioner Provided

Power is conferred on the commission to select a transportation commissioner, resident of the city, who shall be the adviser of the commission in all matters of operation under the ordinance. The same safeguards are thrown around the selection of this commissioner as are placed about the appointment of members of the commission. The duty of the commissioner shall be to keep informed as to all conditions and elements affecting the costs, quality of service supplied, revenue, expenses, value of company's property, rate of fare and return yielded the company. The company shall supply offices for the commissioner and pay the expenses of the whole board, including the salary of the commissioner. The commissioner is to have access to all books and documents of the company relating to or bearing upon the operation of the company under the franchise.

If either the city or company is dissatisfied with the finding of the commission as to increase of service, extension or abandonment of lines, it shall have the right to have such finding submitted to arbitration. Notice of such action requires 30 days. One arbitrator is to be selected by the company, one by Council, and in event of failure to agree upon the third the presiding judge of the Court of Appeals is to make the selection. In arriving at their decision the arbitrators shall take into account that the company, under the franchise, is entitled to a reasonable return. The finding of the arbitration board is final.

The Transportation Commission controls paving requirements in case of new construction only. Old paving must be kept in repair by the company.

The company is to have the exclusive right under the franchise to operate street cars and buses over streets it occupies. The city agrees not to permit any one to operate buses or jitneys over these streets or in territory served by the company. Should the city fail to do this, the company has the right, at its option,

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to terminate the contract with the company.

The right of purchase upon three-months notice is reserved to the city. Should the negotiators fail to agree upon a price, arbitration is provided upon the same basis as service arbitration. The city shall pay within six months the full cost fixed by the arbitrators, if it elects to be fully bound by the decision.

All tracks not now in use shall be removed or covered with pavement. This work shall be done under the supervision of the commission. Certain tracks on Market Avenue from Second Street south to Second Street north are to be removed immediately. Certain other tracks are to be relocated. Other tracks are to be brought to grade.

Right is reserved to the company to transport freight or express and to operate interurban passenger cars on such routes and during such hours as the Transportation Commissioner may direct, but such transportation shall be commensurate with the needs of manufacturing and business interests and with full regard to the safety and convenience of the traveling public. The company shall not be required to carry city passengers on interurban cars or buses.

All buses are to be brought through the public square, and a shelter station with safety approaches and zones is to be built, the company and city jointly sharing the cost. The station is to cost $40,000. It would be lighted, heated and maintained by the city.

The franchise provides that the company shall purchase all usable and useful buses and equipment, owned and in operation by individuals engaged in transportation service in Canton, as of Nov. 1. This requirement, however, is limited to such buses as may be approved in conference as being suitable for city service under the ordinance. An arbitration board shall settle all differences as to price. The board's finding shall be final.

A penalty of $50 a day is provided in the event the company fails to live up to the franchise provisions.

The present rate of fare in Canton is 6 cents cash, six tokens for 35 cents. The proposed franchise provides for a 10-cent cash fare, five tokens for 35 cents with a 5-cent ticket fare for school children, the tickets to be handled and sold by school officials. Free transfers are provided for continuous passage. The rates of fare fixed shall be binding for five years. After that period the company may either raise fares or surrender its rights under the ordinance, but must first give the city notice in writing six months in advance. Upon its part, however, the city has a year from the expiration of the five-year period to determine whether it will authorize the increase or permit the company to withdraw. During the year the fare is to remain unchanged. The provision covering the question of fares seems to offer the only possible stumbling block to the passage of the ordinance. Some members of the Council think the initial rate too high.

Comment on Twin City Fare Proposal

Comment friendly to the Twin City Rapid Transit Company characterizes the editorials in the papers there, in discussing the plea of the company for increased rates. By this is meant that agreement is expressed with the idea that the company is entitled to a fair return, but at least one of the papers has doubt about the ability of the company to achieve this end through resort to the method it has proposed. As the Minneapolis *Journal* put it, the question is "whether another raise will not be followed by another falling off in business." This same commentator says, however, that if the company's figures are accepted, it is entitled to larger revenues. "If in Minneapolis," it adds, "the company is earning only 4.15 per cent on the actual investment, and in St. Paul only 2.56 per cent, the previously announced report of the commission that 7.5 per cent is a 'reasonable return' seems to make the railway's case unassailable." To this it adds:

> And as the commission itself fixed the fair values of the plants and equipment, and as the companies offer evidence that the average rate of street car fare in the United States is 1 cent higher than the local company's present rate, it has established a *prima facie* case.

In the course of comment in which it stresses the fact that the street car still remains an essential form of transportation, the St. Paul *Pioneer Press* says:

> A word of appreciation is due officials of the St. Paul Street Railway for the manner in which their application for a higher fare has been handled before the State Railroad & Warehouse Commission during the past six or seven months. Last spring a proposal was before the voters to relieve the company of its obligation to pave along the tracks of its property. This burden is relatively heavier in St. Paul than in Minneapolis. To equalize costs of operation between the two cities, a relief measure was indorsed by many public-spirited citizens. Because of long-standing antagonism toward the company, however, this proposal was defeated at the polls, thereby restoring the situation to the point at which it rested a year ago when the company applied for a separate increase in St. Paul. Since then the company has held its hand, and now makes its request for higher fare to apply in both St. Paul and Minneapolis.

That paper feels that one rate of fare for St. Paul and another for Minneapolis would be "illogical, absurd and unjust." It says that every consideration of common sense argues for unity of treatment of the matter in the two cities.

Would Dismiss Injunction Suit in Indianapolis

Dismissal of a suit of the Indianapolis Street Railway, which asked a permanent injunction against officers of the Amalgamated Association, was sought in a motion just filed in federal court in Indianapolis. The injunction suit was brought in connection with the strike of employees in June, 1926. A temporary restraining order was issued against John M. Parker and Robert Armstrong, organizers, at that time, but hearing on a permanent injunction was postponed after both served 90-day sentences for contempt of court.

Attorneys for the railway told Judge Baltzell that the motion for dismissal was filed because the contract which the company had alleged would be violated in event of the strike, no longer is in effect, a new contract having been arranged with the employees. The court indicated a ruling would be made when a formal motion was presented in writing.

Party for Juveniles in Akron

Free rides for the boys and girls! That is the gift of the Northern Ohio Power & Light Company, Akron, Ohio, to the youngsters who will attend the fun-fest on Dec. 22 at the Keith-Albee Palace Theater. Upon presentation of a party ticket the children will be permitted to ride free between the hours set aside preceding and immediately following the party. These tickets will not be collected by the operator, but will be retained by the children for admittance to the theater and for the return ride. The tickets will be distributed by mail.

In making the fun-fest accessible to all needy children, the company is cooperating with the *Beacon-Journal*, the Junior League and the management of the theater.

All Opinions in St. Louis Wage Issue to Be Aired

Oral arguments of both sides in the wage controversy between the St. Louis Public Service Company, St. Louis, Mo., and its union employees, which is up for arbitration by the Missouri Public Service Commission, will be held at Jefferson City on Dec. 21. Testimony in the case was completed recently.

Insurance Policies Christmas Gifts in Omaha

All of the 1,100 employees of the Omaha & Council Bluffs Street Railway operating in Omaha, Neb., and Council Bluffs, Ia., who have served a year or more will receive Christmas presents in the form of life insurance policies amounting to $500 without cost to them. Men who have completed two years of service will be insured to the extent of $750 while men whose service records date back three years or longer will be insured for the maximum amount of $1,000. The policies are being formulated by the Equitable Life Assurance Society of the United States.

According to C. D. Porter, vice-president and general manager, while it is optional with the company management to cancel any or all of these policies at any time, it is its intention to make this insurance plan permanent.

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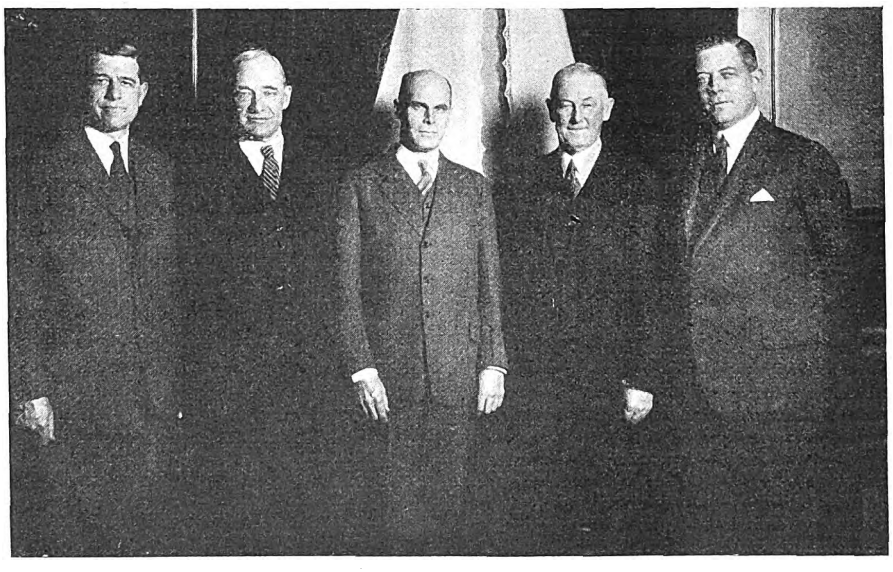
Richmond Celebrates Again

Virginia Electric & Power Company lauded in Chamber of Commerce gathering for its notable contribution to transportation development

STONE & WEBSTER, INC., and the Virginia Electric & Power Company, operated under its management and awarded the Charles A. Coffin award for distinguished transportation service in 1928, were again honored in Richmond on Dec. 1 by state, city and Chamber of Commerce officials at a buffet supper in the Chamber of Commerce club rooms. Charles A. Stone and Edwin S. Webster, heads of the firm that bears their name, were the guests of honor. The Virginia Electric & Power Company was represented by William E. Wood and other officials, while Mayor J. Fulmer Bright, of Richmond, represented the city. State Tax Commissioner C. H. Morrissette was the official representative of Virginia, in the absence of Governor Harry F. Byrd.



Left to right—C. F. Wetterer, Charles A. Stone, C. W. Kellogg, E. S. Webster and William E. Wood snapped at testimonial dinner

Stone & Webster was lauded for the efficient service offered in Richmond and elsewhere in Virginia. Heads of the company, modestly refusing to accept credit for having won the Coffin award, passed on to the officials of the Virginia Electric & Power Company the high tributes paid by each of the speakers.

President of Chamber of Commerce Welcomes Guests

E. B. Sydnor, president of the Richmond Chamber of Commerce, extended a welcome to the honor guests and the chamber members who gathered to express their appreciation for the service rendered by the Stone & Webster Company. John Stewart Bryan, publisher of the Richmond *News Leader* and twice president of the American Newspaper Publishers' Association, presided as toastmaster.

In calling attention to the fact that the award was made in part for the creation of a friendly public, Mr. Sydnor declared: "Gentlemen, this is a new day. To think that a great corporation places this as its first consideration!" In noting the rapid growth of Richmond from a city of 109,000 persons in 1908 to 200,000 in 1928, Mr. Sydnor said that the service rendered by the Virginia Electric & Power Company played an important part in this development.

Mayor Speaks for Public

Mr. Sydnor presented the toastmaster, Mr. Bryan, who, in turn, introduced Mayor Bright, who pointed out that "the award means more than the people of Richmond realize." He continued: "We realize that the welfare of the city is in direct ratio to transportation development. Our program of improvement this year has resulted in 9 miles of paved streets." Some of this work, he explained, had been done upon streets upon which street cars operated.

Mr. Stone, the senior member of the firm of Stone & Webster, referred to the gathering as one unusual in his business experience.

Virginia's development, even as far back as the first permanent English settlement at Jamestown, was due largely to the transportation available, he said. He recalled that Virginia was the first state to have a complete system of canals and declared that he was pleased to find that Virginians still realized the importance of transportation. He expressed his appreciation to city officials and citizens of Richmond for the cooperation accorded the efforts of his company in their program of development.

Mr. Webster made a brief address, thanking the Chamber of Commerce and city officials for the recognition of his company's service and lauding Mr. Wood and other officials of the Virginia Electric & Power Company for their work in this city.

C. W. Kellogg, president of the Engineers' Public Service Company, and C. F. Wetterer, referred briefly to the work of the Virginia Electric & Power Company and the co-operation under whose management it is operated.

"Richmond, the new Richmond," said President Sydnor, of the Richmond Chamber of Commerce, in his talk, "was born in 1910. By that I mean the industrial Richmond, the city that now has a population of 200,000 persons." During that period, he said, the postal receipts had increased from $539,000 to $2,252,000 annually; the value of the city's manufactured products from $76,000,000 to $250,000,000, and its bank deposits from $31,000,000 to $136,000,000. Pointing to the state as a whole, Mr. Sydnor declared that during the past five years $150,000,000 in outside capital had been invested in Virginia. This, he said, amounted to more than had been invested during a 25-year period prior to 1923.

Mr. Morrissette, speaking for Governor Byrd, expressed regrets that the state's chief executive was unable to attend the function. He took advantage of the opportunity to review, briefly, the tax reforms of the state, and declared that Virginia's rapid development in recent years was due largely to such improvements.

Mr. Herrman Also Honored

Among officials of the Virginia Electric & Power Company in attendance were Mr. Wood, president; T. Justin Moore, vice-president and general counsel; Thomas P. Walker, vice-president; J. M. Penick, manager of the railway division; T. Norman Jones, general manager of the Norfolk division; J. B. Hayes, manager of the Norfolk railway division; G. B. Williams, comptroller; R. J. Throckmorton, manager of the Richmond light and power department, and R. C. Foreman, of the personnel department.

Prior to the dinner on Dec. 1 A. H. Herrman, director of publicity and of public relations of the Virginia Electric & Power Company, Richmond, Va., was the honor guest of the Richmond Advertising Club on Thanksgiving Eve. He was lauded for his work in connection with the Charles A. Coffin award for 1928. William E. Wood, president of the Virginia Electric & Power Company, also was present.

Hydro Asked to Cut Fares

Representatives of municipalities served by the Hydro-Electric Railways, Toronto, Ont., adopted a resolution recently, calling on the management to introduce a new and lower rate of fare. The joint transportation committee consented to a continuation of the 7-cent cash fare but called on the Hydro-Electric Commission to fix a ticket rate of nine for 50 cents, at once and retain it for a six-months' trial period.

Permission has been granted by the Indiana Public Service Commission to the Terre Haute, Indianapolis & Eastern Traction Company to cancel its bus operating certificate in Richmond, Ind.

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Recent Bus Developments

East Penn Traction Would Buy Bus Company

The East Penn Traction Company, Pottsville, Pa., applied to the Public Service Commission on Dec. 12 for permission to acquire the controlling interest in the East Penn Transportation Company, which conducts a bus service in Schuylkill and Carbon counties. In the application it was said the bus company was incorporated in the interests of the traction company, and that stockholders of the East Penn Transportation would be reimbursed for their payments on subscriptions of stock.

Akron Company Reacts Favorably to Petition

Upon request of a large number of Goodyear employees living adjacent to Copley Road and Maple Street in the western limits of Akron, Ohio, the Northern Ohio Power & Light Company has begun a new express bus line from the west side of the city to the Goodyear plants at the extreme eastern side of the city.

Extension by San Jose Road

A certificate of public convenience and necessity has been granted by the Railroad Commission to San Jose railroads, San Jose, Cal., to operate auto stage service between Minnesota and Lincoln Avenues in the city of Willow Glenn, and Curtner and Lincoln Avenues in the County of Santa Clara.

Boston to Maine Buses to Connect With Street Cars

The Boston & Maine Transportation Company, which operates the Boston & Maine bus and truck service, has obtained a permit from the Massachusetts Department of Public Utilities to run its buses into Boston. The Fitchburg-Cambridge line will be permitted to carry passengers to Park Square, which it has never been allowed to do before. Two restrictions are attached to the certificate, as follows:

That this certificate is issued upon the condition that vehicle operated hereunder shall not, when bound toward Boston, take on or admit passengers in Cambridge or Boston nor, when bound in the opposite direction, receive passengers to be discharged, nor stop to discharge passengers, in Boston or Cambridge.

That this certificate is issued upon the condition that the applicant shall with its vehicles make such connections with such railroads or street railways at such points as the department may from time to time order, and shall, in connection with said railroads or street railways, provide such through transportation upon its vehicles and upon such railroads or street railways and such joint rates therefore, as the department may from time to time order.

Pittsburgh Buses No Bonanza

A. W. Robertson, president of the Pittsburgh Motor Coach Company, Pittsburgh, Pa., says that, contrary to some opinions, it is a difficult problem at best to make even a reasonable profit from the operation of that company. He cites the fact that the three months ended September, 1928, were probably the worst the company has experienced. One reason is that routes recently started have proved unprofitable.

STATEMENT OF PITTSBURGH MOTOR COACH COMPANY FOR JULY, AUGUST AND SEPTEMBER, 1928

Total bus revenues (Fares and all other income)	$173,629
Total expenses, taxes and licenses. (Paid out for wages, gasoline, oil, tires, etc.)	$184,667
Loss from operations	$11,037
Interest paid on borrowed money	$5,213
Total loss for three months	$16,251

In slightly more than three years of operation the Pittsburgh Motor Coach Company shows on its books a surplus of only $72,363, a profit of 1½ cents per passenger carried. No dividends have been paid.

The total bus investment on Sept. 30, 1928, was $594,952. The amount earned for the twelve months ended Sept. 30, on this investment was $45,176, or 7.6 per cent. Mr. Robertson explains that, unfortunately, bus companies have more passengers than they can carry for a short time in the morning and evening and more buses than necessary at other times.

In the expenses for July, August and September is included an item of $31,665 for renewals and replacements. This establishes a fund to replace wornout buses and other equipment of the company. The money accumulated is used from time to time to buy new buses and other equipment. In this connection the president says:

If too much is set aside, the company would be able to buy more buses than were worn out. That would not be fair to the public. On the other hand, if not enough is set aside, the company cannot buy as many buses as are worn out. This would not be fair to the public or to the company.

The average useful life of the buses is estimated to be four years. None of the older buses have been run this long. We think the allowance is about right for the present ones. This money does not go out of the treasury of the company, so that no injustice is done, even though the amount for a given month is too high or too low, as the sum set aside can always be corrected by actual experience.

Rehearing on Independent's Operation in Amsterdam

A rehearsing is scheduled before the Public Service Commission on Dec. 19, on the petition of the Fonda, Johnstown & Gloversville Railroad relating to the commission's order of Oct. 18, granting a certificate to Charles Vollmer for the operation of a bus line over certain streets in Amsterdam, N. Y. The railway alleges that since the granting of the certificate the trolley has suffered a material decrease in receipts on certain lines. It is further alleged that Mr. Vollmer is carrying passengers in parts of Amsterdam where he is prohibited under the terms of the certificate granted.

Awaiting Bus Debut in Geneva

After 43 years of service the Geneva, Seneca Falls & Auburn Railroad has gone practically into the discard. It is continuing to operate with two large cars and one small car as the only rolling stock, in addition to the snow-plow, sweeper and repair car. Other cars are being dismantled.

Although the Geneva Railway Bus Lines, successor to the trolley line, holds franchises to operate buses between and through Geneva, Waterloo, and Seneca Falls, no move has been made to place machines in operation. A fleet of buses is on the way and any day may see the trolley line abandoned and a bus schedule substituted.

Colonial Coach Lines, Inc., with headquarters in Watertown, will take over the local franchises and property of the Geneva Railway Bus Lines, as indicated when franchises were sought.

Brooklyn Routes Under Discussion

The New York Transit Commission has announced no decision will be made until Dec. 19, although the 30-day period allowed the Equitable Coach Company for negotiations with Brooklyn-Manhattan Transit Company over Brooklyn bus routes expires on Dec. 15, indicating material progress is being made toward an agreement between the Equitable and the B.-M. T. in connection with bus operation in Brooklyn. It is reported the Brooklyn company will virtually take over the Equitable's franchise through purchase of a controlling interest in the company. As the franchise now stands, the Equitable must operate 55 per cent of the routes authorized by the Transit Commission.

Temporary Suspension on St. Louis Line

The St. Louis Public Service Company, St. Louis, Mo., has discontinued its Sunday and holiday bus service on De Baliviere Avenue from Delmar Boulevard to the Jefferson Memorial Building in Forest Park. Service will be resumed next spring.

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Financial and Corporate

332-Mile Merger

Cincinnati, Hamilton & Dayton to be nucleus for one of largest interurban systems in the United States

THE Ohio Public Utilities Commission, on Dec. 10, authorized a merger of interurban railway and bus properties, serving Columbus, Springfield, Dayton, Lima and Toledo, with the Cincinnati, Hamilton & Dayton Railway into one system comprising 332 miles of track.

Involved in the deal, but not included in the consolidation, is the Lima Street Railway, ownership of which also passes to the Cincinnati, Hamilton & Dayton, but to be operated independently under present management.

Properties to be merged with the Cincinnati, Hamilton & Dayton are the Indiana, Columbus & Eastern Traction Company, operating between Columbus, Springfield and Dayton and between Springfield and Lima; the Lima & Toledo Railway, operating between those cities, and the Dayton & Columbus Transportation Company, operating buses from Dayton via Springfield to Columbus, and between Springfield and Lima.

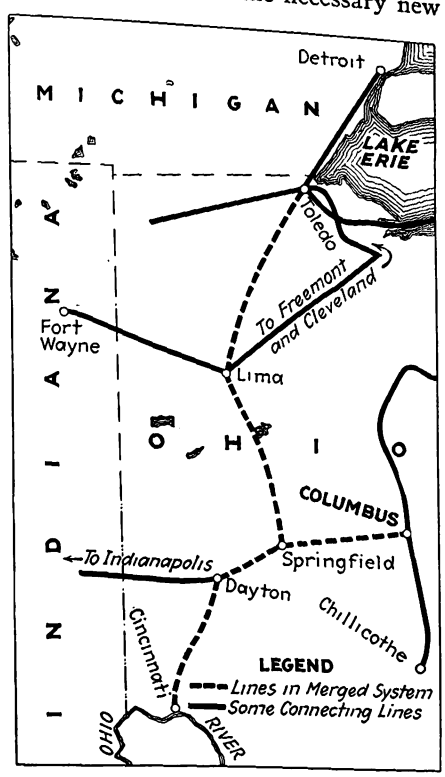
The merged system, including the parent company, which operates between Cincinnati, Hamilton and Dayton, will connect the Great Lakes at Toledo with the Ohio River at Cincinnati and extend as far eastward as Columbus.

System Will Quicken Freight Deliveries

The control of the Cincinnati, Hamilton & Dayton after the consolidation will remain, as heretofore, in the hands of the Cincinnati, Hamilton & Dayton Corporation—a holding company organized some three years ago by the present management of the Cincinnati, Hamilton & Dayton.

The new consolidation is prompted by a purpose to supply up-to-date transportation for the people of Ohio. The capitalization of the Cincinnati, Hamilton & Dayton has been most conservative and will be continued on a like basis, its bonded debt representing, dollar for dollar, new capital invested during the past three years in the modernization of its property. A similar conservative course will be followed in capitalizing the much larger property. The bonded debt of the Indiana, Columbus & Eastern and the Lima-Toledo properties will be scaled from $9,181,000 to $1,390,750 and annual interest charges cut from $469,050 to $83,445. In brief, the Cincinnati, Hamilton & Dayton contemplates an extension of its methods and policies over a much wider territory. To this end it will seek to enlist co-operation on the part of the public, the municipalities, and the operating personnel.

It is expected that consolidation will markedly quicken freight deliveries and will make possible the provision of additional freight equipment, the extension of sidings, the enlargement of freight stations, and other facilities required. By creating a situation of economic stability, in place of the highly unstable situation now existing, and backed by its record of achievement, the Cincinnati, Hamilton & Dayton will be in a position to command the necessary new capital which the properties about to be taken over cannot themselves raise.



Between "The Gateway to the South" and the Inland Lakes

On the operating side it is expected substantial economies will be made possible, among them the elimination of many overhead expenses; the rearrangement of schedules, achieving in full measure the advantages of unified operation; the concentration of major repairs in the Cincinnati, Hamilton & Dayton's new carhouse and the reduction in freight loss and damage claims, in consequence of the elimination of much rehandling of freight, now required. The consolidation will remove many of the obstacles which heretofore have largely paralyzed the efforts of the officers of the properties lying to the east and north of Dayton, and will bring about not only a physical merger but a unification of effort and purpose which should galvanize the entire personnel to render ever better service to the public.

In this connection sight should not be lost of the fact that the physical and financial transformation of the Cincinnati, Hamilton & Dayton is one of the outstanding achievements of the last three years in the electric railway industry. Its passengers now ride over what is probably the finest interurban track in the State of Ohio. Its new all-steel passenger equipment embodies the latest developments in the car builders' art and affords the maximum degree of comfort and safety to the traveling public. Its passenger stations have been thoroughly rehabilitated. Eight new sub-stations supply adequate power at all points for the propulsion of its trains and have extensively reduced this very important element of operating costs. The Cincinnati, Hamilton & Dayton's new carhouse, situated at Moraine, Ohio, is equipped with every device necessary in connection with the maintenance of cars. In short, the Cincinnati, Hamilton & Dayton has been transformed, by the investment of more than $2,000,000 of new capital, from an obsolete, decrepit, interurban property to one of the most modern of electric railroad properties. It is the recognition of this willingness to work shoulder to shoulder in the solution of new problems along lines dictated by efficiency and the requirements of good service, that has enlivened public interest in the possibilities ahead of the roads to be taken over.

Negotiations Begun for Sale of Omaha Bridge

President Shannahan of the Omaha & Council Bluffs Street Railway, Omaha, Neb., has begun negotiations with the committees named by the Councils of the two cities for the sale of the bridge connecting them. He is urging as the preliminary step that a price be agreed upon for the bridge first, after which the value of the lease may be taken up. The bridge company owns the bridge and the Council Bluffs lines, but is paid a net rental of $60,000 a year in excess of all interest charges by the railway on a ninety-nine year lease. The profits from the bridge are about $200,000 a year. The lease provides that if the Omaha & Council Bluffs Railway & Bridge Company cannot renew its franchise in Council Bluffs in 1947, the lease could then be terminated.

The Omaha & Council Bluffs Street Railway naturally attaches considerable value to its lease because of its profitable character. Moreover, the bridge company recently refunded a $2,000,000 bond issue. The Omaha company has a second lien for $893,000 for improvements, payable at termination of the lease. These are merely some of the angles to the matter. President Shannahan admits the difficulties are great, but feels they are not insuperable.

Tacoma-Seattle Line to Cease Dec. 30

Formal notice has been filed with the State Department of Public Works at Olympia, Wash., by Scott Z. Henderson, receiver, calling for termination of operations of the Puget Sound Electric

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Company's interurban line from Tacoma to Seattle on Dec. 30. The action is in compliance with an order issued by Federal Judge E. E. Cushman. The interurban has been in operation for 25 years, and has been steadily losing money in the last few years.

Sale of the property was recently postponed.

Eighth Report on Rochester Operations

Review of service-at-cost contract between city and New York State Railways shows continued trend of decreased riding

ROCHESTER lines, New York State Railways, failed by $329 to make the 6 per cent return on operation during the year ended July 31, 1928, guaranteed under the service-at-cost contract with the city of Rochester, N. Y., according to the report of Railways Commissioner Charles R. Barnes to Mayor Joseph C. Wilson and the Council. This deficit is considerably less than the $60,128 deficit of the preceding year. However, the report points out, the accumulated deficit under the service-at-cost contract as of July 31, 1928, was $341,791. The contract between the railways and the city is for a ten-year period, expiring in August, 1930.

The deficit is mainly due to bus operation, which shows a loss of $60,105. Subway operation which began Jan. 1, 1928, shows an $8,123 deficit while the surface trolley lines returned a surplus of $67,898. Despite the deficit in the bus and trackless trolley operation, Commissioner Barnes declares that the service has justified itself through giving increased flexibility to the trolley system, opening new sections of the city and increasing the value of property. The losses are held "more apparent than real due to acceptance of street car transfers on the buses."

The report reveals a decrease in passengers over the previous year of 5,180,000 or 7.7 per cent. A table accompanying the report shows a steady decline each year since the inception of the contract system. This is blamed largely on the increased use of private automobiles.

The base valuation of the Rochester properties is shown to have increased to $20,314,905.

Relief from the "unjust burden" of street paving costs is urged in the report, which also recommends the increased use of one-man cars. The commissioner points out that of the fourteen lines in the city, on only two are one-man cars being operated. Extension of the use of this type to other lines, with increased headway in non-rush hours, is recommended.

A substantial part of the report is devoted to a résumé of the results of operating the new subway railroad, built by the city and run by the railways.

PASSENGERS CARRIED BY NEW YORK STATE RAILWAYS ROCHESTER LINES

Year	Revenue Passengers	Total Passengers
1920–1921	75,317,829	100,160,130
1921–1922	73,749,709	98,976,180
1922–1923	75,924,153	101,503,258
1923–1924	74,039,667	98,611,044
1924–1925	72,441,331	96,212,154
1925–1926	70,338,834	93,592,481
1926–1927	67,200,690	89,210,869
1927–1928	62,020,118	82,516,175

SUMMARY OF PASSENGERS CARRIED ON SUBWAY LINES

Lines	Revenue	Transfer	Total	Passenger Revenues
Local	380,321	107,504	487,825	$33,343
Rochester & Eastern	342,962	67,562	410,524	23,389
Rochester, Lockport & Buffalo	112,723	34,333	147,056	7,084
Rochester & Syracuse	50,839	9,764	60,603	4,382
Totals	886,845	219,163	1,106,008	$68,200

RESULTS FROM OPERATION OF ROCHESTER RAILWAYS CO-ORDINATED BUS LINES, INC., FOR THE YEAR ENDED JULY 31, 1928

Revenues	Gasoline Buses	Trolley Buses	Total
Passenger revenues	$62,627	$66,845	$129,473
Other transportation revenues	215	.....	215
Miscellaneous operating revenues	109	45	154
Total operating revenue	$62,951	$66,891	$129,843
Operating Expenses			
Maintenance of plant and equipment	$19,392	$23,569	$42,961
Operating garage expenses	34,563	16,374	50,938
Transportation expenses	24,247	19,510	43,758
Administration and general expenses	8,179	6,980	15,159
Renewals and depreciation	12,224	7,870	20,095
Total operating expenses	$98,608	$74,306	$172,914
Operating deficit	$35,656	$7,414	$43,070
Taxes assignable to operation	1,199	921	2,121
Gross deficit	$36,855	$8,336	$45,191
Return on investment	7,053	7,860	14,913
Bus operating deficit	$43,909	$16,196	$60,105

ACCUMULATED DEFICIT AS OF JULY 31, 1928

Surplus from surface lines year ended July 31, 1928	$67,898
Deficit from subway lines eight months ended July 31, 1928	8,123
Deficit from bus lines year ended July 31, 1928	60,105
Service-at-cost deficit year ended July 31, 1928	329
Accumulated deficit as of July 31, 1928	$341,791

ROCHESTER LINES, NEW YORK STATE RAILWAYS FOR YEAR ENDED JULY 31, 1928

	Surface Lines	Subways**	Total
Revenue from Transportation			
Passenger revenues	$5,069,579	$56,733	$5,126,312
Chartered car revenues	2,122	.....	2,122
Mail revenues	87	.....	87
Switching revenues	.....	5,545	5,545
Miscellaneous transportation revenues	1,395	101	1,496
Total revenue from transportation	$5,073,184	$62,380	$5,135,564
Revenue from Other Railway Operations			
Station and car privileges	$61,644	$317	$61,961
Rent from tracks and facilities	25,100	2,409	27,510
Rent from buildings and other property	39,604	.....	39,604
Parcel room receipts	.....	348	348
Total revenue from other railway operations	$126,349	$3,075	$129,424
Total Railway Operating Revenues	$5,199,533	$65,455	$5,264,988
Railway Operating Expenses			
Maintenance of ways and structures	$500,985	$5,558	$506,543
Maintenance of equipment	368,299	7,479	375,779
Power	278,821	9,875	288,697
Conducting transportation	1,613,402	33,418	1,646,820
Traffic expenses	13,242	831	14,073
General and miscellaneous expenses	568,137	13,299	581,437
Renewals and depreciation	300,000	.....	300,000
Total railway operating expenses	$3,642,889	$70,462	$3,713,351
Net Operating Revenue	$1,556,644	*$5,007	$1,551,636
Auxiliary operating revenues	$1,080	.....	$1,080
Auxiliary operating expenses	2,322	.....	2,322
Auxiliary operating deficit	$1,241	.....	$1,241
Net operating revenues	$1,555,402	*$5,007	$1,550,395
Taxes assignable to operation	308,785	327	309,112
Operating income	$1,246,617	*$5,334	$1,241,282
Non-operating income	8,385	.....	8,385
Gross income	$1,255,002	*$5,334	$1,249,667
Return on investment	1,187,103	2,788	1,189,892
Railway Operating Surplus	$67,898	*$8,123	$59,775

*Denotes deficit. **Figures on subway operation are for a period of eight months.

Would Shorten One Line in Rome

The New York State Railways applied, on Dec. 4, to the Public Service Commission for approval of a declaration of abandonment of a part of its line in Rome, a distance of 3095 feet. It is alleged that this part of its road is no longer necessary for adequate and successful operation or for the convenience of the public.

Rate of Return Reduced in California Case

The Railroad Commission of California has found unanimously that a rate of return of 7 per cent per annum on the capital invested, in the case of a stable and established utility like Southern Counties Gas Company is reasonable, instead of allowing a return of 7½ or 8 per cent, as heretofore. This action was taken in fixing the rates for service of natural gas in Ventura City and County by that utility.

The decision marks a precedent in favor of 7 per cent rate of return on the capital invested by a public utility, in view of the "marked decline in the cost of money" during the last few years. The commission held that with the lower rate of return it would be

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possible for the utility to obtain the needed capital to function properly.

The commission fixed rates upon a basis estimated to result in a total reduction of approximately $50,000 a year to consumers throughout the area served. However, certain of the so-called convenience users of gas will have their bills increased slightly, due to the establishment of a service charge.

The commission found that a rate base of $1,350,950 would be reasonable for the company, or approximately $68,000 less than the amount claimed by the company.

Another Move Made Against Philadelphia Underliers

The Council of Philadelphia has sent to the committee on transportation and public utilities the resolution on proposed city condemnation of the P.R.T. underliers. The measure would authorize the City Solicitor to ask Common Pleas Court whether such city debts as may arise from purchase of the underliers will not constitute a burden against municipal borrowing power. Prior to introduction of the Mayor's resolution, communications from the Public Service Commission and President R. T. Senter, of the P.R.T., were read. The commission indicated that it would approve a purchase agreement based on the underlier valuation of $139,000,000, plus the $10,000,000 mortgage on the Market Street subway. Mr. Senter offered assurance that the P.R.T. will continue to pay the city the rentals that are now paid to underliers if the city buys the franchises.

Kansas Sale Indefinitely Off

Owing to a better situation in local business in Pittsburg, Kan., the sale of the Joplin & Pittsburg Railway has been indefinitely postponed. It had been announced by John F. Layng, general manager for M. H. McLean, receiver, that all the properties of this company would be offered for sale on Dec. 1. The sale was to be made on orders from the federal court for the Western District of Missouri.

$16,800,000 Intercompany Transaction in Brooklyn

The board of directors of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., on Dec. 7 authorized the sale to the Chase Securities Corporation, Hayden, Stone & Company and J. & W. Seligman & Company of $16,800,000 principal amount of the New York Rapid Transit Corporation's refunding mortgage 6 per cent sinking fund gold bonds, series B. They were authorized some time ago by the transit commission to be issued by the New York Rapid Transit Corporation because of extensive purchases of new cars and other capital betterments, and to be sold to the Brooklyn-Manhattan Transit Corporation.

Personal Items

V. S. Shinkle Resigns

Vincent G. Shinkle, secretary and treasurer of the Spokane United Railways, Spokane, Wash., resigned on Dec. 1. In announcing his resignation Mr. Shinkle said he wanted to gratify his life-long ambition to travel. He plans to visit California shortly and then Europe.

Mr. Shinkle entered the employ of the Washington Water Power Company on July 1, 1907, as storekeeper. Two years later he became purchasing agent and on June 1, 1918, he was made secretary-treasurer. When the Spokane United Railways was formed on July 1, 1922, he was named secretary and treasurer of that company.

I.C.C. Nominees Go to Senate

The nomination of Patrick J. Farrell of Vermont and the District of Columbia to be a member of the Interstates Commerce Commission was sent to the Senate on Dec. 6 by President Coolidge. Mr. Farrell is to succeed Commissioner John J. Esch.

Nominations of Claude R. Porter of Iowa and Clyde B. Aitchison of Oregon to be members of the commission also were sent to the Senate. The last two are reappointments.

Transit Counsel C. M. Lewis Resigns

Clarence M. Lewis, counsel for the New York Transit Commission since July 1, 1926, resigned on Dec. 3 for "private and personal" reasons.

His first step after his appointment was a complete reorganization of the commission's law department. Prior to his appointment to the commission he was a member of the Home Rule Commission and was at one time chairman of the legislative committee of the Citizens' Union and chief counsel to the State Housing Commission. He is the author of several law books.

Walter Burke Praised for His Work in Southwest

Fitting tribute is paid by *Cactus Points*, published by the El Paso Electric Company, to Walter H. Burke, district manager for Stone & Webster in the Southwestern district, since April, 1927, who was recently transferred to the company's Boston office. The El Paso paper says that Mr. Burke "represents the type of keen official whose youth and vigor is in keeping with the electrical industry."

Fifteen years ago he was a student engineer in the Boston office, later being made clerk to the manager at Dallas. At that time the light, power and transportation company at Dallas was operated under the executive management of Stone & Webster, Inc. Following the change here, Mr. Burke went back to the Boston office and for seven years was assistant to the division manager in charge of the Southwestern district.

In this position he gained valuable experience and was made manager at Keokuk, Iowa. Subsequently he became manager at Houghton, Mich., going to Texas from the North. Mr. Burke was made manager of the Northern Texas Traction Company at Fort Worth in July, 1925, and in April, 1927, became manager of the Southwestern district, with headquarters in Houston.

While in office as manager of the district, he made many friends among the personnel of the various companies. *Cactus Points* says that in leaving the Southwest district Mr. Burke has the best wishes of the officials and employees of the El Paso Electric Company.

A. W. Koehler with Safety Body

A. W. Koehler was recenty appointed secretary of the National Conference on Street and Highway Safety. Mr. Koehler has a record of effective service in organization and accident prevention work.

At Purdue University Mr. Koehler specialized in industrial engineering, and after he was graduated in 1916 he saw service for several years in accident prevention and industrial relations work with the Commonwealth Steel Company, Granite City, Ill., and the Atlantic Steel Company, Atlanta, Ga. During the World War he went into the Naval Service, received an officer's commission and was assigned to engineering duty. Since the war he has served as executive secretary of the Safety Council of the Rochester Chamber of Commerce, and subsequently as head of the accident prevention work of the railway systems of Rochester, N. Y., and Milwaukee, Wis.

In making the announcement, Col. A. B. Barber, director of the conference, pointed out that the appointment is an indication of the increased activities which the National Conference on Street and Highway Safety is undertaking as an outgrowth of the completion of the Uniform Vehicle Code, the Model Municipal Traffic Ordinance and other measures for promoting nation-wide uniformity of traffic regulations and assistance in dealing with the problems of street and highway traffic.

J. L. CAMPBELL was appointed chief engineer of the Northwestern Pacific Railroad, San Francisco, Cal., effective Nov. 1, 1928.

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Edward Jones Pearson

President of New Haven had confidence in company's electric railways and approved program providing for their rehabilitation. Was quick to appraise bus

EDWARD JONES PEARSON, who retired recently as president of the New York, New Haven & Hartford Railroad, died suddenly on Dec. 7 at the Johns Hopkins Hospital in Baltimore.

It was in April, 1916, that he went to the New York New, Haven & Hartford Railroad, and after serving for thirteen months as vice-president, he succeeded the late Howard Elliott as president of the road.

At that time the work of rehabilitation of the New Haven was only just beginning to get well under way. In 1913 the dividends on common stock had been suspended, the morale of the personnel was at ebb and the system was pretty generally discredited with the public in the communities which it served.

Into this situation, first as vice-president and then as president, Mr. Pearson threw himself with the full vigor characteristic of the man, with the result that his entire term of office was one of progress. Separate operation had been arranged for the lines of the Connecticut Company, but when the matter of the possible disposition of the local railways in Springfield and Worcester came up for settlement, Mr. Pearson, through Vice-President Buckland, announced the confidence of the New Haven management in the local railway situation there by pledging the railroad to the expenditure of several million dollars for rehabilitation, in order that these properties might be converted into the earners he visualized them rightly to be.

Not only that, but in the midst of the general program of reclamation of the entire system came the bus with its threat of competition. One would think that Mr. Pearson's experience in knitting together the loose ends of the transportation empire embracing steam lines, trolleys and steamships, which had gone almost completely to smash, would have made him hesitate in his attitude toward the newcomer. He did, but not for long. Then he entered upon the program under which the bus has been converted into an ally to an extent that makes the New England Transportation Company, the New Haven's bus operating subsidiary, with its 400 vehicles, certainly the biggest operator in that respect, if not in actual route miles, among the steam railroads. It was not diversity of activity that had brought the New Haven to the brink of ruin, but lack of co-ordination that had helped to invite disaster. That Mr. Pearson and his associates were convinced of this, appears to be attested beyond a doubt by the evidence in both of these cases.

One of Mr. Pearson's greatest achievements was in inducing the business men and bankers of New England to raise money among themselves to prevent foreclosure. After five years of uphill fighting, the private offering of $23,000,000 of 6 per cent bonds to refund the issue maturing April 1, 1925, was over-subscribed. Mr. Pearson saw in this novel experiment in railroad financing the beginning of a new era of co-operation between the industries of the section and the railroad.

And the record of the man is all the more remarkable, since of the arts by which popularity is commonly secured he had not a trace, but he had as friends those who were doing their work in the spirit with which he did his—for the sake of the thing to be accomplished and not for personal remuneration. It was well said of him by his associate on the New Haven board, Arthur T. Hadley, president emeritus of Yale, that in every part of the country, north, south, east and west, the name of Mr. Pearson is gratefully remembered by his fellow-workers from chief engineer down to trainman. Mr. Hadley said:

> Two years ago we saw that he was beginning to wear himself out, and besought him to take a well-earned rest, but he was not the man to rest while his work for others was undone. Only when he saw light ahead, saw that the heaviest part of his work was done and that he might safely confide the future to others, was he willing to think of rest, and then it was too late for him to enjoy the fruition of his hopes and plans, not too late for him to have received that profoundest enjoyment which comes from the confidence and loyalty of those who have worked with him and under him.

Mr. Buckland said:

> It is not easy at a time like this to say what one feels regarding the loss of a leader and a friend. Mr. Pearson was more than leader and friend; he was a comrade—loyal, inspiring and generous. Mr. Pearson's administration was a striving against and mastering of overwhelming odds. We, who were associated in his service, are proud to have served under him; we shall cherish in our memories his years of service and comradeship.

Edward Jones Pearson was born in Rockville, Ill., on Oct. 4, 1863. He received his early education in the West and came to Cornell University for his technical training, obtaining in 1881 the degree of Bachelor of Science in civil engineering. In the year of his graduation Mr. Pearson got a job as a rodman with the Missouri Pacific and began a career of railroad building.

He then became chief engineer of the Pacific Coast Extension of the Chicago, Milwaukee & St. Paul, remaining until June 1, 1911, when he became first vice-president of the Missouri Pacific and the St. Louis, Iron Mountain & Southern railways, in which capacity he served until April, 1915. For one year following he was first vice-president of the Texas & Pacific.

On Nov. 27 when the New Haven was returned to a regular dividend basis, President Pearson offered his resignation because of the state of his health. His resignation was accepted, but no successor was named.

J. J. Sullivan

Jeremiah J. Sullivan, at one time a leader of railway interests in Philadelphia, Pa., and other parts of the country, died in Philadelphia on Dec. 11. For many years before his death he had been president of the Union Traction Company, Philadelphia, and also of the Frankford & Southwark Philadelphia City Passenger Railroad of which he was president for twenty-eight years. In 1890 he bought the Lehigh Avenue Passenger Railway and later participated in the formation of new companies and the mergers of others.

In addition to his local railway interests, Mr. Sullivan at the time of his death was president of the Scranton Railway, the Altoona & Logan Valley Railroad and the Bridgeton & Millville Traction Company. Not long ago he resigned from the presidency of the Chicago & Joliet Electric Company. Besides his street railway affiliations he was one of the founders of the Philadelphia Electric Company and had been a member of the board of directors from its beginning.

Mr. Sullivan was born in County Cork, Ireland, ninety years ago. He completed a business course at Crittenden College, later going into the wholesale dry goods business with his brother and forming the firm of Sullivan & Brother in 1860. A few years later he became interested in the promotion of various street railways which obtained long-term operating rights to the city streets, but are now included in the system of the Philadelphia Rapid Transit Company, which runs them under lease.

HENRY INNES ROGERS, the head of the firm of Brecknell, Munro & Rogers, well-known British manufacturers of electric tramway fittings, died recently. In his earlier years he installed electricity on a number of tramways for various firms. Later he became chairman of Brecknell, Munro & Rogers, pioneers in their business. In recognition of his services in the production of munitions during the war, he was made a member of the Order of the British Empire.

DANIEL J. MCDONALD, night depot master at Flatbush depot of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., for more than thirteen years, died recently. He was appointed a motorman on Feb. 13, 1896, at the Flatbush depot. On Dec. 3, 1909, he was promoted to line inspector.

VICK N. FLOWERREE, former assistant general manager of the Kansas City, Leavenworth & Western Railway, Kansas City, Mo., died on Nov. 13 in Los Angeles. He was for many years connected with the old Metropolitan Street Railway, Kansas City.

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Additional Equipment Orders Planned

Chicago Railways plans purchase of 100 new cars. Track construction projected in Seattle. Brooklyn subway construction program expedited

COINCIDENT with the beginning of the winter months, the volume of orders for material and supplies continues to decrease, according to reports received from a number of electric railways. At the same time, however, additional improvement programs continue to be made.

Permission to purchase 100 new street cars at an estimated cost of $1,725,000 has been asked in a petition filed recently in the Federal District Court of Chicago, by Henry A. Blair and Frederick H. Rawson, receivers for the Chicago Railways Company. The hearing on the application will be held on Dec. 20. The petition recommends a front-entrance, center-exit type of car, designed to seat 61 passengers, as compared with a capacity of 51 passengers in the most recent type of equipment placed in service by the Chicago Railways. The cost of the new cars, it is proposed, shall be met out of the special equipment fund of the Chicago Surface Lines, established by order of the Illinois Commerce Commission in 1920. The average cost of the 496 cars previously purchased was $15,289, as compared with an estimate of $17,250 for each of the new units.

Chicago Railways, which operates on the north and west side surface lines in Chicago, has been in receivership under the jurisdiction of Federal Judge James H. Wilkerson since January, 1927. In their petition, the receivers point out that no new passenger equipment has been acquired by the railroad since 1926 and the number of revenue riders in that time has increased about 17,000,000 annually.

Seattle Construction Planned

Immediate appropriations to finance new construction necessary for the rerouting of West Seattle street cars into the business district over First Avenue South, and possibly for building a new line on Fourth Avenue from Spokane Street to Dearborn Street, was asked by the Seattle Municipal Street Railway, Seattle, Wash. It is estimated that it will cost approximately $99,000 to do away with the so-called Whatcom Street elevated, and switch the West Seattle cars to First Avenue. Approximately $80,400 must be spent for replacing rail and incidental paving on this avenue, between Spokane and Stacey Streets. These figures are part of the $244,000 worth of reconstruction and repair work contemplated by the railway at once.

Against the recommendation of Superintendent Avery, the Seattle City Council has voted unanimously to order the construction of a single-track extension of the Beacon Hill street car line. This has been petitioned for repeatedly by the residents of that district. A single-track line extension to Columbian Way which was ordered at this time, will cost $23,210 and to Graham Street, $42,250. Another step in the proposed city-wide improvement program for the street railway system, which will give a closer transportation service to a thickly settled area of more than a square mile in the northwestern part of the city, is the construction of a new street car line to be built along Eighth Avenue, northwest from Leary Avenue to the north city limit at West 85th Street. This work will cost $100,000 and is to begin early in the coming year.

Brooklyn Subway Project

The chairman of the New York Board of Transportation announced recently at a public hearing on the form of contracts to be let for the construction of the proposed Fulton Street subway in Brooklyn, between Lafayette and Alabama Avenues, that work on the line, in all probability, will be under way by the middle of next year. The section of the line to be started first extends about 1½ miles from Lafayette Avenue to Nostrand Avenue. The program calls for the beginning of work beyond Nostrand Avenue to Alabama Avenue as soon as designers can be released from work on the first section.

This construction will be made by the cut and cover method, and an effort will be made to avoid disturbances of sidewalks and highways as much as possible. Surface car operation in the street will be maintained during construction and the Fulton Street elevated structure will be supported as were such structures in Manhattan during similar operations. The stations will be among the largest on the new city-owned subways and will be built with entrances at street corners at each end, and will be equipped with automatic turnstiles. The subway as planned will have four tracks, providing for express service.

Milwaukee Subway Started

Excavation work has been started on the rapid transit and subway project to cost $4,000,000 in the west section of greater Milwaukee by the Milwaukee Electric Railway & Light Company. The operation marks the first step in the actual construction of the new line, which will extend along the north side of the Menomonee Valley on a private right-of-way to Eighth Street and St. Paul Avenue, where the subway starts. The new route covers a distance of 2.8 miles.

The grading work will be pushed as rapidly as possible to 30th Street, and eastward from there as soon as the necessary land is acquired. It is estimated that the overground part of the line can be finished in about eighteen months, and a year will be required for the subway. Double tracks will be laid as the grading progresses and provision will be made for the laying of an additional pair of tracks in the future.

In taking over the Windsor, Essex & Lake Shore Railway, Kingsville, Ontario, the Ontario Hydro-Electric Power Commission has undertaken to provide the new management with $100,000 working capital, and also to place $700,000 to the credit of the management in the bank so it will be available for road improvements. As soon as these undertakings are carried out, the Ontario Hydro Commission will take over the management of the road.

All rapid transit lines through the city of Evanston, Ill., are now operated on the temporary elevated structure which has been completed by the Chicago Rapid Transit Company, Chicago, Ill. This new structure eliminates twelve grade crossings and clears the way for construction of the permanent structure which has already been started with the grading of crossings at Ridge Avenue and Lincoln Street. These streets are to be open under the elevated structure. Crossings at these locations were formerly elevated over the surface tracks of the railway.

Line Materials in Demand

Pittsburgh Railways, Pittsburgh, Pa., contemplate the purchase of 40 miles of No. 00 round copper trolley wire, 160 30-ft. creosoted yellow pine poles, and eighteen 45-ft. creosoted pine poles. Among line materials ordered by this company, are 100,000 ft. of No. 8 weatherproof copper wire, 2,500 16-in. No. 0000 rail bonds, 1,500 ft. of $\frac{7}{16}$-in. copper weld span wire, 9,000 ft. of $\frac{5}{16}$-in. copper weld span wire, 45,000 ft. of $\frac{1}{4}$-in. copper weld span wire, and 85 No. 8 cone anchors. The miscellaneous line material ordered by this company includes six electric track switches with T-3 ground box and circuit changers, 40 universal frogs, 30 No. 00 solid crossings, 250 midget train insulators, 600-500,000 circ.mil. straight line insulators, 300 1,000,000 circ.mil. corner insulators, 150 No. 00 cam tip approaches, 100 No. 00 renewable approaches, 50 double curve suspensions, 50 molded insulators, five type C friction insulators, and seventeen type LCD floodlight projectors.

Line materials ordered by the Chicago Surface Lines, Chicago, Ill., include 500

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No. 0000 9-in. bonds, 500 No. 000 left-hand, and 300 right-hand malleable switches with 6-in. approaches, and 200 No. 000 90-deg. rigid galvanized malleable iron crossovers complete with 6-in. brass renewable tips. Track and construction material ordered by this company includes 400 7-in. fishplates, 200 Arrow sledgehammers, 500 concrete points, 100 Toledo bombshell torches, 300 African bass push brooms, 400 16x2¾x1¾-in. grinding wheels, and 400 Dietz lanterns with ruby globes.

Track Equipment Ordered

Track material ordered by Pittsburgh Railways include 10,000 white oak ties, 15,000 creosoted ties, 155 tanks of oxygen, 50 tanks of acetylene, 30 kegs of boat spikes, 45 kegs of track bolts, 20 pair of 18-ft. switch points, 20 pair of 7-in. joint plates, 30 drums of Tarmac, one carload of molding sand, 20 sewer drops, six carloads of lumber, namely 2-in., 3-in., 4-in. white oak, and 4x6-in. stringers, and two cars of ½-in. screening.

This company has ordered one set of rewinding material for an 1,800-kw. 600-volt, six-phase rotary converter and one set of armature coils for a direct-current generator of 1,000-kw. 550-volt capacity. Among some equipment ordered are two Blecker blacksmith hammers. Seven 4,300 type low-floor, center-entrance cars, are being remodeled for one-man operation.

New revolving chairs have been ordered for installation in the parlor observation cars of the Chicago South Shore & South Bend Railroad, Michigan City, Ind. The chairs will be of the latest type, set at a convenient angle and free to be completely revolved at the passenger's will. Installation of these chairs in the parlor cars is expected to be completed shortly after the first of the year.

Pittsburgh Railways has ordered two 29-passenger Yellow coaches and three 21-passenger Yellow coaches. The Illinois Power & Light Corporation, Decatur, Ill., will replace five of its old buses with new ones costing approximately $8,000 a piece. The old buses will be remodeled for trucking purposes.

The Boston Elevated Railway plans a repair shop 85 ft. x 150 ft. to cost approximately $100,000 with equipment and boiler house.

Detroit Car Order Signed

The contract for the purchase by the Detroit Street Railway of 100 street cars from the Perley A. Thomas Car Works, High Point, N. C., has been formally signed. While Commissioner of Purchases Joseph E. Mills, appearing before the council, informed that body that deliveries would be speeded up, the contract does not alter in any way the original bid of the company. The Thomas company was the low bidder, but it was contended that its offer did not conform with specifications. The case is now before the Michigan Supreme Court.

1928 Improvement of Union Traction

Indicative of the improvement program of the Union Traction Company of Indiana, Anderson, Ind. are the purchases made during the year 1928 by this company. Track materials ordered during the year include ten carloads of rail, 70,000 Northern white cedar ties, 30,000 creosoted ties, one carload of tie plates, one carload of joint plates, three carloads of spikes and one carload of bonds. Track construction and maintenance equipment purchased include two hand cars, one gasoline car, a rail drill, an electric welder and similar maintenance equipment. Overhead line material ordered include three carloads of trolley wire, one carload of hard drawn bare wire, one carload of insulated wire, 2,000 poles, two carloads of insulators, overhead frogs and crossovers and line department equipment sufficient for regular maintenance.

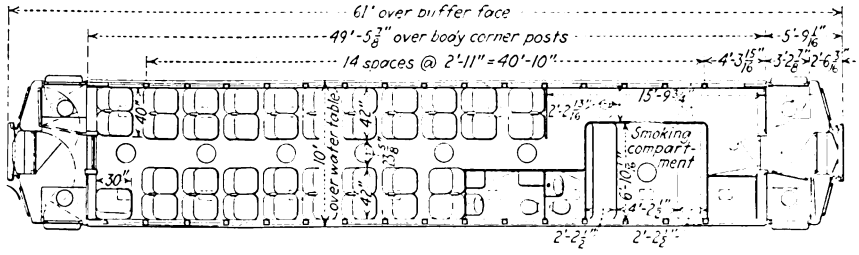
All interurban and city cars were repainted and fifteen cars were remodeled and rebuilt. It is contemplated to purchase from ten to twenty one-man cars in high grade used condition for several short lines on the road. This company purchased nine used White buses which were remodeled and rebuilt in first-class operating condition. All buses of the system were thoroughly overhauled, repainted and placed in good condition. Ten rebuilt freight cars and approximately ten flat bottom gravel cars were purchased.

Shop and garage equipment purchased included three battery charging outfits, two air pumps and small supplies of equipment necessary for the operation of three bus garages. All buildings were remodeled with the addition of new roofs, floors, etc.

Specifications on Cars for South Shore Line

Chicago, South Shore & South Bend Railroad, Michigan City, Ind., has ordered ten more steel passenger cars, as mentioned in Electric Railway Journal of Nov. 10. Five of these cars are motor equipped and five are of the trailer type. They are similar to the former order of cars and are being built by the Standard Steel Car Company, Hammond, Ind. They are the double-end, double-truck type designed for operation by two men in interurban passenger service. Each car is 61 ft. long, 10 ft. 1¼ in. wide, and weighs 133,600 lb. fully equipped. The bodies are of all-steel construction with arch roofs and swinging end doors, and seat 48 passengers. They are finished in orange and maroon lacquer, the interior finish being mahogany. The seats are attractively finished in plush with leather trim. Brass sash ventilators are installed in the lower rail and each car is equipped with a Pullman style smoker.

The trucks are equipped with two inside-hung motors and 36-in. rolled steel wheels. Both the armature and journal bearings are of plain type. Further details of the motor cars are given in the accompanying specifications. The trailer cars are similar in construction.



A Pullman type smoking compartment is included in the new cars being built for the Chicago, South Shore & South Bend Railroad

Weights:	
Car body	67,500 lb.
Trucks	33,400 lb.
Equipment	12,700 lb.
Motors	20,000 lb.
Total	133,600 lb.
Bolster centers	38 ft.
Length over all	61 ft.
Length over body posts	49 ft. 6¼ in.
Truck wheelbase	7 ft.
Width over all	10 ft. 1¼ in.
Height, rail to trolley base	13 ft. 1 in.
Date of order	Oct. 1, 1928
Date of delivery	March, 1929
Window post spacing	35 in.
Body	All steel
Roof	Arch
Doors	Swinging end
Air brakes	Westinghouse AMU
Armature bearings	Plain
Axles	Heat-treated steel 5½x10 in.
Car signal system	Electric Service Supply Company 32 volts
Compressors	Westinghouse D-3-F
Conduit	Metal
Control	Westinghouse HBF 1,500 volts
Couplers	Tomlinson form 23
Curtain fixtures	Railway Curtain Supply Company
Curtain material	Pantasote
Destination signs	Hunter
Energy saving device	Sangamo kwh meters
Finish	Sherwin Williams lacquer
Floor covering	Linoleum and rubber tile
Gears and pinions	Westinghouse grade BP
Glass	Plate
Hand brakes	Peacock Staffless
Heat insulating material	Balsom wool
Heaters	Railway Utility, electric
Headlights	Golden Glow, portable
Headlining	Aluminum
Interior trim	Mahogany
Journal bearings	Plain
Journal boxes	Symington
Lamp fixtures	Adams & Westlake
Motors	Four Westinghouse 567C, inside hung
Painting scheme	Orange and maroon
Roof material	Canvas covered poplar
Safety car devices	Deadman control-Westinghouse
Sash fixtures	O. M. Edwards
Seats	Hale and Kilburn No. 900
Seat spacing	35 in.
Seating material	L. C. Chase Byzantine plush, leather trim
Slack adjusters	Westinghouse form "J"
Steps	Stationary
Step treads	Saf-Kar treads
Trucks	Bladwin
Ventilators	Railway Utility Company
Wheels, type	Rolled steel, diameter 36 in.
Wheelguards or fenders	Steel pilot

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ELECTRIC RAILWAY MATERIAL PRICES—DEC. 11, 1928

Metals—New York

Copper, electrolytic, cents per lb	15.775
Lead, cents per lb	6.5
Nickel, cents per lb., ingot	35.00
Zinc, cents per lb	6.7
Tin, Straits, cents per lb	49.5
Aluminum, 98 or 99 per cent, cents per lb.	23.90
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	53.00
General service	31.50

Bituminous Coal

Smokeless Mine Run, f.o.b. vessel, Hampton Roads, gross tons	4.375
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.8
Franklin, Ill., screenings, Chicago	1.425
Central, Ill., screenings, Chicago	1 15
Kansas screenings, Kansas City	1.625

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, $\frac{5}{16}$ in. and larger, cents per lb	2.80
Tie plates (flat type), cents per lb	2.15
Angle bars, cents per lb	2.75
Rail bolts and nuts, cents per lb	3.90
Steel bars, cents per lb	1.95
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.40

Hardware—Pittsburgh

Wire nails, base per keg	2.55
Sheet iron (24 gage), cents per lb	2.8
Sheet iron, galvanized (24 gage), cents per lb.	3.55
Galvanized barbed wire, cents per lb	3.20
Galvanized wire, ordinary, cents per lb	3.00

Waste—New York

Waste, wool, cents per lb	18.
Waste, cotton (100 lb. bale), cents per lb.:	
White	17.25
Colored	13.5

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb	10.4
White lead in oil (100 lb. keg), cents per lb.	13.25
Turpentine (bbl. lots), per gal	$0.65
Putty, 100 lb. tins, cents per lb	5.725

Wire—New York

Copper wire, cents per lb	17.875
Rubber-covered wire, No. 14, per 1,000 ft.	5.3
Weatherproof wire base, cents per lb	17.125

Paving Materials

Paving stone, granite, 5 in., f.o.b. New York—Grade 1, per thousand	$150
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd., f.o.b.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	51.00
Paving brick 3x8½x4, N. Y., per 1,000 in carload lots, f.o.b.	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd., delivered	3.375
Cement, Chicago consumers' net prices, without bags, f.o.b.	2.05
Gravel, ¾-in., cu.yd., delivered	3.375
Sand, cu.yd., delivered	2.125

Old Metals—New York and Chicago

Heavy copper, cents per lb	13.375
Light copper, cents per lb	11.625
Heavy yellow brass, cents per lb	7.875
Zinc, old scrap, cents per lb	3.375
Lead, cents per lb. (heavy)	5 125
Steel car axles, Chicago, net ton	$15.75
Cast iron car wheels, Chicago, gross ton	14.50
Rails (short), Chicago, gross ton	17.50
Rails (relaying), Chicago, gross ton (65 lb. and heavier)	28.50
Machine turnings, Chicago, gross ton	8.25

Encouraging Business Outlook

In the general business situation there is ample evidence to support the expectation of continued prosperity, according to the Guaranty Trust Company, New York City.

This evidence is not found in the mere fact of great industrial activity; for such a condition, while it certainly implies a large volume of aggregate purchasing power, may only be contributing to an unsound position in commodity markets, if the purchasing power is flowing into the wrong channels. The significant fact is that the high wage scales and the widely distributed income of the last few years apparently continue to operate as strongly as ever, so that active industrial operations are balanced by a ready movement of goods into the hands of consumers. The situation has been improved this year by further agricultural recovery, by a stronger position in certain industries that have been facing special difficulties, by a decline in unemployment, and by a continuance of economic progress in foreign countries.

General Electric Dividends

The regular dividends of the General Electric Company were declared at a meeting of the board of directors of the company on Dec. 7, 1928, amounting to $1 per share on the common stock and 15 cents per share on the special stock, payable Jan. 25, 1929, to stockholders of record as of Dec. 19, 1928. In addition an extra dividened of $1 per share, payable on the same date, was declared on the common stock from the surplus of the company accumulated from the financing of time installment sales, which surplus had been set aside as a reserve as stated in the 1926 annual report and which amounted to upward of $5,000,000, and from the increase during the present year in income from investment and sources other than regular sales.

English Electric Companies Merger

At recent meetings of the British Thomson-Houston Company and the Metropolitan-Vickers Electrical Company, it was stated that steps were being taken by these companies together with the Edison-Swan Electric Company and the Ferguson-Pailin Company which would lead to close co-operation, the elimination of unnecessary duplication of effort and expenditure, and the effecting of economies generally. The arrangements foreshadowed are now reported to be completed.

The Metropolitan-Vickers Company has acquired a large majority of the ordinary shares of the British Thomson-Houston, Edison-Swan, and Ferguson-Pailin Companies, and also a large majority of the preference shares of the last mentioned company. It is proposed to change the name of the Metropolitan-Vickers Company to make the title more comprehensive and the number of directors will be increased to include representatives of the various financial interests in the enterprise. H. C. Levis will be chairman and Sir Philip Nash managing director.

The majority of the shares will be owned by British holders. It is not intended that the activities of any of the four companies should be curtailed, but that they should actively co-operate under the general guidance of a central board. The business of the Metropolitan-Vickers Company will continue to be carried out by an existing subsidiary company, called the Metro-Vick Electrical Products.

TRADE NOTES

MAX RUBENSTEIN has been transferred from the Philadelphia sales office of the Standard Underground Cable Company, Division of General Cable Corporation, to the general offices of the company in Pittsburgh where he will devote his time to the sales promotion of cable accessories.

CUTLER-HAMMER MANUFACTURING COMPANY, Milwaukee, Wis., has moved its Atlanta office into new quarters at 150 Peters Street, S.W., Atlanta, Ga. In addition to sales and engineering service on motor control apparatus and wiring devices, the new location provides warehouse facilities where many types of standard devices will be carried in stock for direct shipment to customers in that territory. A. C. Gibson is manager in charge of the Atlanta office.

BOTFIELD REFRACTORIES COMPANY, Philadelphia, Pa., announces that McCarthy-Jones & Allen Company, 111 First Avenue South, Nashville, Tenn., has been appointed distributor.

ADVERTISING LITERATURE

ARMCO CULVERT MANUFACTURERS' ASSOCIATION, Middletown, Ohio, has issued bulletin No. H-34, entitled "Selecting Culverts and Drains on the Basis of Cost per Year." This bulletin includes comprehensive information on the purchase price, transportation from factory to site, cost of installation, maintenance and repairs in service, depreciation or cost of retirement, annual cost, and effect of durability on annual cost. The subjects discussed in this bulletin are supplemented with illustrations, drawings, detail tables and charts.

RUSSELL T. GRAY, Chicago, Ill., has issued bulletins Nos. 2 and 3 descriptive of Master equipment. Bulletin No. 2 is devoted mostly to various types of pliers. Bulletin No. 3 includes an illustrated description of a new method of handling high-voltage line maintenance and a complete description of Master tools and line equipment.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has issued bulletin No. 249A, descriptive of GE-258 railway motor bearings; 61B, constant speed direct-current motors, type C.D.; 844A, across the line type of magnetic reversing switch for single-phase, two-phase and three-phase motors; 518A, type K-75 low, light-weight railway controller; and 746B, describing hinged type fingers for railway and industrial haulage controllers.

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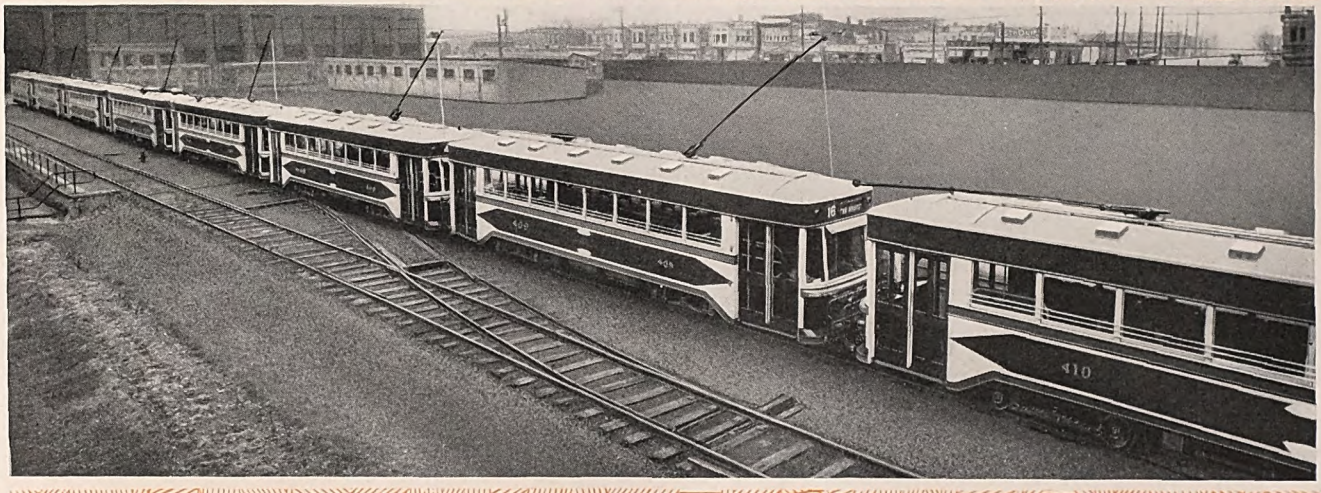

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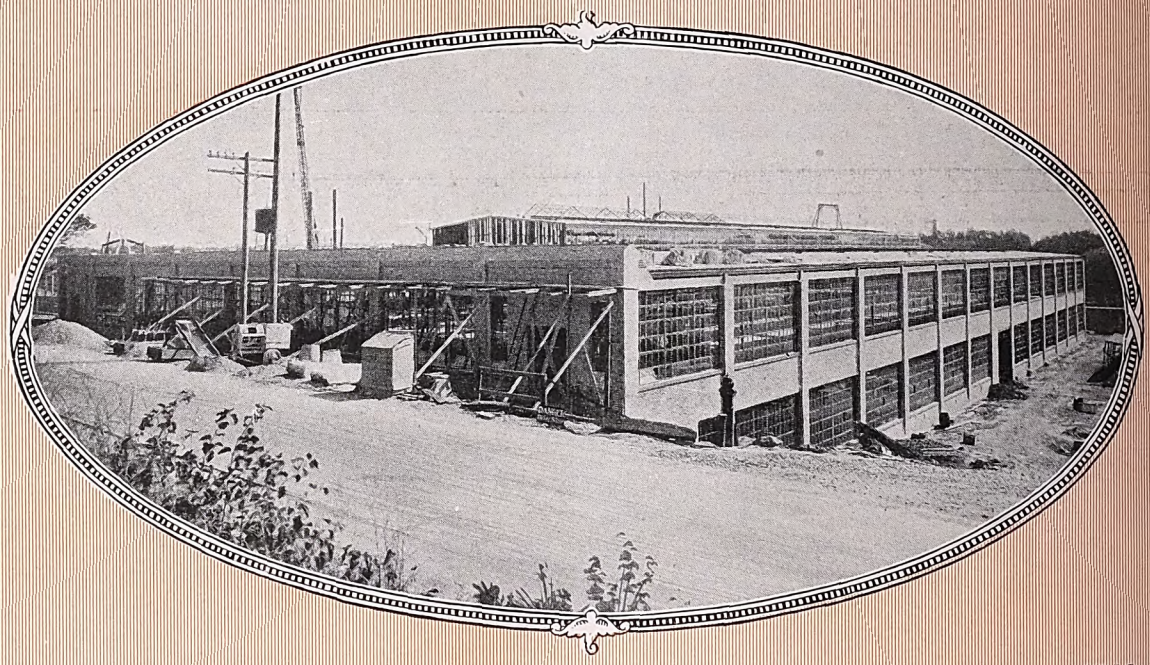

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ELECTRIC RAILWAY JOURNAL

raw-Hill Publishing Company, Inc. DECEMBER 22, 1928 Twenty Cents Per Copy

The Electric Railway Car has carried more Christmas shoppers to stores, more children to see Santa Claus, more packages to homes than any other vehicle.

To the members of this industry which has contributed so much to the spirit of this holiday we wish a very

MERRY CHRISTMAS

BARRON G. COLLIER, INC.

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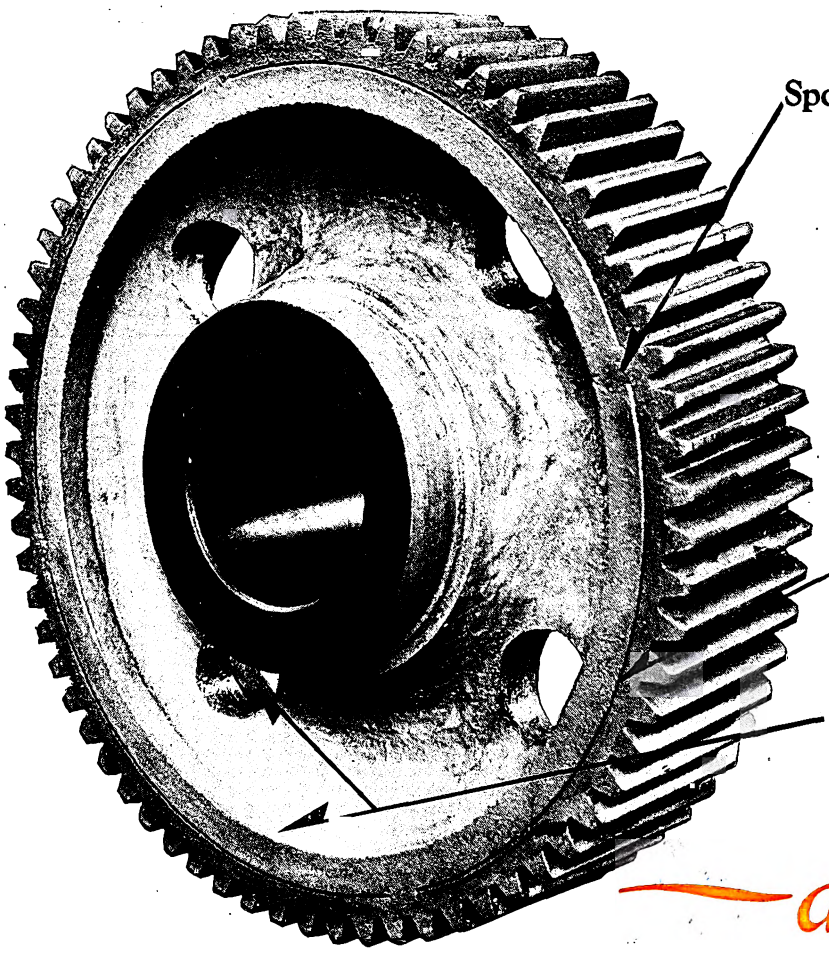

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Electric Railway Journal

Consolidation of
Street Railway Journal and Electric Railway Review

McGraw-Hill Publishing Company, Inc.
James H. McGraw, *Chairman of the Board*
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H. C. Parmelee, *Editorial Director*

CHARLES GORDON, *Editor*

Louis F. Stoll,
Publishing Director

Volume 72 New York, Saturday, December 22, 1928 *Number 25*

Paracelsus, Wherever He Gazed, Beheld a Star

IT HAS truly been said that ideals rule the world, even while the world cynically derides them. Ideals lift men above the commonplace and the material. They are frequently hidden and guarded behind the human masks that are worn to meet a hard work-a-day materialism. Only for brief moments are the masks themselves thrown aside. And only then does mankind, in every walk of life, reveal its ruling spirit. At this season of the year we call it the Christmas spirit.

It is lack of imagination that makes life's Scrooges what they are and that blinds them to the many manifestations of this Christmas spirit in our daily work and play. When the employees of the Louisville Railway sat in a great banquet to celebrate their own devotion to duty and to the saving of human life and suffering, the Christmas spirit walked among them to bless their contribution to human happiness. When the entire city of Richmond rose up to honor a public service management which had won national honors for the "Old Dominion" through its accomplishment in rehabilitating a vital community transportation service, it was a shining demonstration of the practical application of this same spirit. Something transcending monetary award motivates men who face driving storm and howling blizzard to insure the safety and comfort of their fellows.

This Spirit of Christmas is, after all, a very practical thing. We see it reflected on every hand, wherever men work or play. In our work we call it the spirit of service. In our play we name it good sportsmanship. A great nation-wide association of business men have adopted as their motto: "He who serves best profits most." The Christmas spirit is a state of mind that raises men above the level of a mere struggle for existence. At this season we cast aside that struggle, for a moment, to rejoice at the coming of the simple Man of Galilee and open wide our hearts.

Electrification After 124 Years

A WELL-KNOWN adage declares "Happy the country which has no history." If this is true also of railways, a line in Swansea, Wales, must have had a joyful time for the 124 years that it has been in existence. At least it has been spared growing pains. Though continuously in operation, it has remained the same length —6 miles—that it was when horses drew the first car from Swansea to Oystermouth. Like the one-horse shay celebrated by Oliver Wendell Holmes, it has kept serenely at its work while empires have risen and fallen.

For more than 70 years, horses continued to haul cars over this modest Welsh railway. Then, in 1877, a great step forward was taken. A few steam locomotives were purchased, but the cars continued to be of the street railway type. Finally, in this eventful year of 1928, when some pessimists are saying that electric cars are becoming obsolete, the directors decided to adopt electric power. This momentous event in the history of a 124-year-old road is chronicled in this issue.

Managers elsewhere, harassed by many problems of street congestion, automobile and bus competition, demands for extension and talk about abandonment, will extend congratulations to their British compeer. They will express the hope that it may have another 124 years of continued life and success with no further change in motive power.

Community Welfare the Proper Basis for Traffic Regulation

BRANDING as obsolete the theory that streets are designed for moving vehicles, the Fifth Avenue Association of New York City has come out flatly in favor of parking on that important thoroughfare. Whatever may be said concerning the theory, the practice of moving vehicles is practically obsolete there. Traffic moves at a snail's pace now and complete stagnation appears to be not far away.

Despite the present serious congestion, a large majority of the Fifth Avenue merchants are reported to believe that liberal parking regulations are vital to the successful conduct of their business. They "estimate" that 30 per cent of their customers come by private automobile and they seek therefore to maintain Fifth Avenue as a garage for their customers rather than to allow it to function as a real traffic artery.

The weakness of this position lies in the fact that Fifth Avenue belongs not to the particular stores located there but to the whole city. If no one but the customers themselves suffered from the present traffic congestion the public might well regard it with indifference. But many people other than customers use this important street, and they, too, suffer from the congestion. Moreover, one need not be a mathematician to calculate that the curb space on Fifth Avenue is insufficient to accommodate the number of customers claimed to come by automobile. The fact is that many of these automobiles are parked on other streets besides Fifth Avenue itself. In other words, the aristocratic avenue trade is usurping a large amount of curb space on the humble side streets. This is one of the most serious causes of traffic congestion in mid-town Manhattan. Undoubtedly the public as a whole would be better off if Fifth Avenue and the adjacent streets were used for traffic instead of garage purposes.

In pleasing contrast to the selfish and parochial attitude of the Fifth Avenue Association is that of the

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Citizens Traffic Committee recently organized under the auspices of the Board of Trade. Many leaders in business and civic affairs are included in this group. As one of the speakers at the organization meeting pointed out, there has been too much talk about individual traffic problems and too little planning for the city as a whole. It is thought by the committee that a means may be found to make better use of existing facilities and thus bring speedy relief. There is sound common sense in this proposal, and the wide variety of interests represented on the committee affords ground for hope that this body is headed toward a city-wide plan of improvements. Only by considering the welfare of the entire community can a real solution of the traffic problem be found.

Detroit Substitutes Buses for Jitneys

HISTORY was made in Detroit on Nov. 25 when the Department of Street Railways inaugurated service on the first of its de luxe bus routes, established to accommodate the former patrons of the ousted jitneys. Whether the decision to provide this service will prove to be a wise one or not remains to be seen, as actual operating experience is the only measure by which a venture of this kind can be judged. However, it is an unusual step, a very significant one, and it will bear close watching by all transportation men.

De luxe service has been given in other cities, notably Pittsburgh, Toronto, Washington and Newark, but the Detroit installation is very much different from any of these. Not only is the character of service somewhat different, but also it was instituted for a much different reason than any of the others. In Washington, some of the lines were developed as sightseeing lines. In Pittsburgh, the lines were started to develop an entirely new class of patronage, those who were accustomed to driving to the city in their own automobiles. The de luxe service in Detroit, however, was started after the city passed an ordinance demanding all jitneys to cease operation, and was instituted entirely to serve the former patrons of the jitneys. This is a somewhat different set of conditions than experienced in any other city and the very nature of the installation and the size of the proposed system make it an outstanding venture.

Much criticism has been leveled against the new system. A great deal of this, of course, has come from the owners of the jitneys that were ousted, and other chronic kickers. The argument has been presented that the D.S.R. should have purchased more large capacity buses and street cars to increase the service on its mass transportation lines rather than to set up an entire system of small capacity, high-speed buses. In support of this, proponents of the plan for more mass transportation vehicles point out that service is inadequate on practically all of the lines and that the proper move would have been to add more vehicles to relieve this condition. They claim also that the former jitney patrons, numbering about 80,000, could have been accommodated with a much smaller number of larger buses or street cars and that the company would have assumed less risk of losing on the installation. The opposite stand is that the majority of the former jitney patrons would not use mass transportation vehicles, even if more were provided, but rather that they would use their own or their neighbors' automobiles.

The Department of Street Railways also has been criticized for ordering as many as 160 parlor coaches and definitely deciding upon several routes, in view of the system being in every sense of the word an experiment. The chief reason for the company instituting so many lines was to take care of as many of the former jitney patrons as possible. The city was responsible for ousting these vehicles and felt a responsibility to give the people a comparable service.

A few commentators have gone so far as to claim that the company decided to use buses of too small a capacity. In this respect, the company was very wise, for only with small vehicles can a service be given comparable to that of the jitneys. Whether or not such a service can pay on 10, 15 and 20-cent fares remains to be seen. These buses are to give what may be called correctly a convenience service and not a necessity. It really accommodates a class of patrons that is willing to pay higher fares, and as such should be considered from the angle of opening up a new field for organized public transportation. Should the Detroit venture prove successful, no doubt other cities will take steps to install similar systems. The developing of higher classes of service by buses, with correspondingly higher fares, has been advocated for some time, and it is encouraging to see a step in this direction so important as that in Detroit.

Intricacies of the Negligence Law

THE usual rule that a person must bear the consequences of his own carelessness is by no means universally applied in law. Its principal exception is that if one careless person injures another, and the latter would not have been hurt if he himself had not been careless, the contributory negligence of the second person may save the first from paying damages. Still another exception arises when the person injured is engaged in unlawful business, where this business contributed to, or as it is termed, was "causable" to the accident.

In a number of recent street railway cases this principle has been applied, and the courts have gone to considerable trouble to define the circumstances in which violations of the law by the person injured have been, or have not been, contributory to the accident. Thus, it has been held in Massachusetts (Bacon *vs.* B.E.R. Co., 152 N.E., 35) that an improperly registered automobile is a nuisance on the highway, and consequently if it is injured in a collision with a street car the railway company is not responsible. This case is especially interesting because the automobile was licensed, but the owner, a woman who had been married for two years, had registered it under her maiden name.

A case involving a somewhat similar principle was decided the other way in New York State in Klinkenstein *vs.* Third Avenue Railway, 168 N.E., 886, where a car collided with a bus which was operating under a permit from the Department of Plant and Structures but was violating the law because it had not also obtained a certificate of convenience and necessity from the Public Service Commission. In this case the court held the railway responsible on the ground that the illegal act was not that the bus was on the street but that it was carrying passengers for hire. Hence, the violation of the statute had no direct connection with the injury which was suffered from the collision. Moreover, the statutes covering the licensing of common carriers provided penalties for failure to comply with them, and the court thought it should not add other penalties.

So important do courts consider the question involved that the whole subject has just been reviewed in a lengthy

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decision by the Supreme Court of New Hampshire (Johnson vs. Boston & Maine R.R., 143 A., 516). In this case an automobile driver was injured by a train at a grade crossing and lost his claim for damages because it was discovered that he had not taken out a state driver's license. The court pointed out that although the law required the driver to have his license with him, it made a difference whether he had simply left it home by carelessness or whether he had never applied for one. It pointed out that the purpose of the law was to exclude incompetent drivers from the roads, and this could best be done by requiring all drivers to be licensed. Had the driver simply left his license at home the court intimated the decision might have been in his favor.

In expanding this idea, the court cited the case of an injury to a boy who was violating the law by working when he should have been in school, but here the violation made no difference because the law was designed to promote education and for no other purpose. Violation of the Sunday law comes under the same rule, the court pointed out, as does driving on the wrong side of the road, unless that contributes to the accident.

These decisions are of particular interest in that they have a bearing upon several important phases of negligence cases.

Are the Earnings Recorded in Red or Black?

RED or black? That was the question asked, not in Monte Carlo, but on a certain small electric railway system where a decision was being made whether certain lines should have improved rolling stock, new track and overhead renewals, or should be abandoned. In other words, it was a process of separating the sheep from the goats. The engineering office of the holding company in a remote city called "Red." The superintendent of the local railway department answered "Black." The engineers showed that the line in question had failed by a good many thousand dollars to meet its operating expenses, while the superintendent's analysis indicated an operating surplus about equal in amount to the deficit shown by the engineers.

When the reason for the discrepancy was sought, it was found that the engineers had obtained their results by allocating expenses on an arbitrary basis of the ton-mile, the car-mile or the car-hour, without considering the relation of these elements to the particular section of the property. The superintendent had apportioned each item according to what he knew were the peculiar physical and operating characteristics of the route in comparison with the rest of the property.

Going further into the explanation, the superintendent was able to prove that "Black" was the correct answer. Here is how he did it.

Energy was determined from actual watt-hour meter records for the type of car and mileage operated. Maintenance of track and roadway, signal and interlocking equipment was taken from direct expenditures on different lines as far as possible, the rest being prorated according to the ton-miles operated per line. Maintenance of paving was divided in proportion to the ton-miles operated on each line in the paved districts. Maintenance of electric lines was proportioned by route-miles. Maintenance of buildings and fixtures was prorated according to the car-miles on each line. To distribute these, the items equipment cost and wages of carhouse employees were studied specially, the number of car defect reports and pull-ins being taken, with a pull-in counted as three defects. Miscellaneous car service expenses were divided in proportion to the car-miles operated on each line. The transportation expense was proportioned according to the platform hours on each line. The ratio of all other operating expenses, exclusive of traffic, general and miscellaneous expenses and taxes were determined for these lines as compared with the total for all lines of the system, and then traffic, general and miscellaneous expenses and taxes were apportioned to each line in the same ratio.

Some of this allocation may be debatable, and some of the assumptions made may be questioned. But the method used of determining individually from known distributions each of the principal items of expense and the result obtained give a striking illustration of the need for careful analysis before the decision is made to abandon investments worth thousands of dollars.

Overlooking the Asset of Safety

AGAIN the committee designated by the American Museum of Safety has met to select the winners of the Anthony N. Brady Memorial Medals, the names to be announced at a meeting of the Metropolitan section of the A.E.R.A. in New York on Jan. 4, 1929. Again the number of participants has been disappointingly small, and the choice of the committee was of necessity limited to the all too few excellent briefs submitted.

The apathy of the industry toward this very meritorious contest is difficult to explain. Surely, there is no lack of interest in safety and accident prevention. One of the most acute problems before the transportation industry today is that of reducing the appalling wastage—for it is nothing else—involved in the settlement of damage claims. To fall into the vernacular, it would appear as though those companies which fail to participate in this contest are overlooking a bet. Intrinsically, of course, the award is not great. But the moral and psychological value of these medals can, if properly capitalized, be made far-reaching in its consequences.

Winner of the Brady Award for Safety! This is an asset and an honor not to be overlooked. Consider the effect upon the personnel, upon the safety habits of the community. Here, indeed, public opinion will say, is a mark at which to shoot. Our street railway is distinguished above all others for its safety of operation. The trainmen on our cars have contributed to make our community an unusually safe place to live in. Why cannot the rest of us be equally distinguished? Our truck drivers, our autoists—are they doing equally well? Will they co-operate to the end that we may maintain civic leadership in this respect?

Consider the effect in accident litigation wherein the trolley company is involved. Will not opinion unconsciously lean toward a company noted for its safety record? Will not witnesses be inclined to favor such a company? Small factors, all, perhaps, but looming large in the general scheme of things and sure to be reflected in ultimate damage cost experience. Congratulations to the winners of this year's awards, whoever they may be! But the industry needs to wake up on the possibilities of this contest. Safety of its service is one of the greatest of the assets which the electric railway can claim in its struggle with the competition of the individual automobile. There should be scores of entries for next year's awards instead of the mere handful who have during the past two years had the vision and the will-to-win spirit to enter this important competition.

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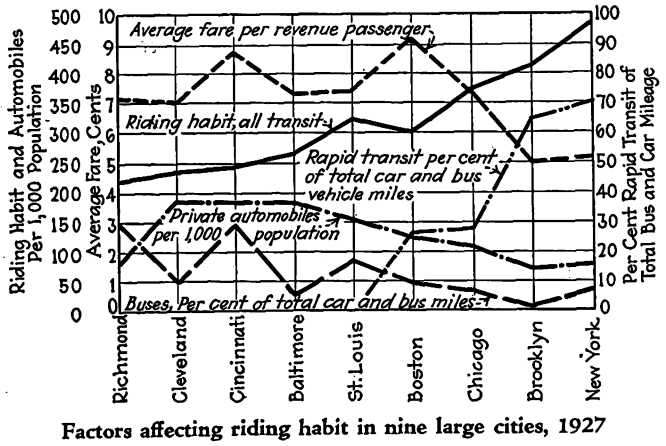
Analysis Made of

Factors Affecting Riding Habit in Large Cities

Study by Beeler Organization indicates that the influence of rapid transit lines is to increase street car riding, while the tendency of bus operation is to decrease it. Failure to provide rapid transit encourages automobile competition

AN EXTENDED analysis of the various factors affecting the riding habits in large cities has recently been made by the Beeler Organization of New York for the Brooklyn-Manhattan Transit Company and the Brooklyn City Railroad. The analysis, in the form of a report, has been submitted to the Public Service Commission by counsel for these companies. It is expected to assist the commission in deciding the question of additional bus franchises in Brooklyn. The report considers the influence on car riding of such factors as rate of fare, use of buses, development of rapid transit lines, and employment of private automobiles. Owing



Factors affecting riding habit in nine large cities, 1927

to the general interest in the nature of this subject, an abstract of this study has been prepared for these columns. The general discussion appears in this issue. A subsequent article will give details of the individual cities.

The results show that the cities employing rapid transit are in a class by themselves. Because of its superior time-saving qualities, great changes in the distribution of population and in the location of its business and industrial sections are occasioned by the introduction of rapid transit. In such cities, the surface lines are not generally patronized for long haul rides, but by the short haul rider to rapid transit stations and to business, theater and shopping districts. Hence, the total car riding per inhabitant is noticeably larger than before the introduction of rapid transit. Indeed, the construction of a rapid transit line often brings an increase in passengers carried by the surface lines only, though the riding changes from long haul to short haul.

In large and medium sized cities, where rapid transit facilities do not exist, the automobile is employed extensively to provide rapid transportation from point to point and the taxicab comes into greatly enlarged use, to the detriment of the slower moving service, and car riding falls off. Rapid transit lines serve to create short haul riding on surface lines because many rapid transit riders use a surface line at one or both ends of the trip, but the use of the automobile does not have this effect. Another element assisting to the decline of the riding habit, in cities without rapid transit, is the growth of community business, shopping, banking and amusement centers in outlying districts. To some extent increase in rates of fare has had its effect. In this connection it may be noted that the bus fare is generally higher than the street car fare.

Fares and Riding Habits

Today there are two general schools of thought on the subject of fares. One is that the increased fare has brought about a decrease in riding. The other is that the decrease in riding has made the increase in fare necessary, especially in later years after the first fare increases were made to adjust fares to the new level of wages and cost of materials. This suggests a third probability: i.e., that in later years the buses, being largely competitive, have caused a decrease in car riding which in turn has made an increased fare necessary.

Table I gives rides per inhabitant and average fare, in each of five cities without rapid transit, yearly from 1918 to date. While the figures show a decrease in riding with an increase in fare, they do not indicate a definite relation between the riding habits and rate of fare that holds true in every case. For example in Cleveland, with a 58 per cent increase in fare, there has been a 29 per cent drop in riding habit, while in Cincinnati, although the fare has increased 74 per cent the riding habit has dropped but 5 per cent. In fact, Cleveland has the lowest and Cincinnati the highest rate of fare in these five cities. One outstanding fact brought out by this table, however, is that the riding habit in these cities begins to fall at about the point where fares increased 30 per cent above the 1918 level. Furthermore, it may be noted, that coincident with the marked increase in bus operations in the past three years, the total surface riding habit, including that on the bus, on the average has continued to decline. These data do not indicate that the

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TABLE I—FARES AND RIDING HABIT IN FIVE CITIES SERVED BY STREET CARS AND BUSES ONLY

Year	Cleveland: Rev. Rides per Inhabitant Per Cent of 1918	Cleveland: Average Fare In Cents	Cleveland: Average Fare Per Cent of 1918	St. Louis: Rev. Rides per Inhabitant Per Cent of 1918	St. Louis: Average Fare In Cents	St. Louis: Average Fare Per Cent of 1918
1918	100	4.44	100	100	5.50	100
1919	103	5.22	117	106	6.25	114
1920	112	5.21	117	114	7.00	127
1921	95	6.04	136	111	6.89	125
1922	91	5.81	131	111	6.89	125
1923	92	5.36	121	113	6.92	126
1924	83	6.09	137	110	7.03	128
1925	79	6.14	138	111	7.17	130
1926	77	6.43	145	109	7.19	131
1927	71	7.01	158	103	7.45	136

Year	Baltimore: Rev. Rides per Inhabitant Per Cent of 1918	Baltimore: Average Fare In Cents	Baltimore: Average Fare Per Cent of 1918	Cincinnati: Rev. Rides per Inhabitant Per Cent of 1918	Cincinnati: Average Fare In cents	Cincinnati: Average Fare Per Cent of 1918
1918	100	5.13	100	100	4.99	100
1919	105	6.02	117	104	6.28	126
1920	107	6.75	132	104	7.44	149
1921	100	6.78	132	93	8.18	164
1922	98	6.83	133	93	7.52	150
1923	99	6.85	133	94	7.64	153
1924	94	7.15	139	86	9.15	183
1925	93	7.36	143	82	9.62	193
1926	92	7.36	143	91	8.73	175
1927	89	7.34	143	95	8.70	174

Year	Richmond: Rev. Rides per Inhabitant Per Cent of 1918	Richmond: Average Fare In Cents	Richmond: Average Fare Per Cent of 1918	Average Five Cities: Rev. Rides per Inhabitant Per Cent of 1918	Average Five Cities: Average Fare In Cents	Average Five Cities: Average Fare Per Cent of 1918
1918	100	4.35	100	100	4.97	100
1919	107	4.71	118	104	5.81	117
1920	108	5.33	123	110	6.35	128
1921	97	5.91	136	100	6.71	135
1922	79	5.88	135	98	6.58	133
1923	93	5.88	135	100	6.46	130
1924	90	5.87	135	94	6.96	140
1925	89	6.26	144	92	7.13	144
1926	91	7.03	162	92	7.18	145
1927	87	7.12	164	88	7.44	150

TABLE II—FARES AND RIDING HABIT OF STREET CARS AND BUSES COMBINED IN FOUR CITIES WITH RAPID TRANSIT SERVICE

Year	Brooklyn: Rev. Rides per Inhabitant Per Cent of 1918	Brooklyn: Average Fare In Cents	Brooklyn: Average Fare Per Cent of 1918	*New York: Rev. Rides per Inhabitant Per Cent of 1918	*New York: Average Fare In Cents	*New York: Average Fare Per Cent of 1918
1918	100	4.78	100	100	4.94	100
1919	98	4.92	103	100	5.02	102
1920	115	5.07	106	107	5.17	105
1921	107	5.01	105	108	5.21	105
1922	120	5.01	105	121	5.18	105
1923	123	5.01	105	121	5.19	105
1924	123	5.00	105	121	5.22	106
1925	123	5.00	105	118	5.29	107
1926	122	4.99	105	116	5.29	107
1927	122	4.99	105	116	5.38	109

Year	Chicago: Rev. Rides per Inhabitant Per Cent of 1918	Chicago: Average Fare In Cents	Chicago: Average Fare Per Cent of 1918	Boston (a): Rev. Rides per Inhabitant Per Cent of 1918	Boston (a): Average Fare In Cents	Boston (a): Average Fare Per Cent of 1918
1918	100	5.02	100	100	5.84	100
1919	106	5.87	117	92	8.86	152
1920	108	7.14	142	94	9.87	169
1921	104	7.98	159	93	9.56	164
1922	103	7.31	146	97	8.93	153
1923	111	6.99	139	103	8.71	149
1924	114	7.07	141	102	8.73	150
1925	114	7.09	141	96	9.26	159
1926	116	7.08	141	97	9.27	159
1927	115	7.10	141	95	9.27	159

*Includes entire city of five boroughs. (a) Rapid transit included.

introduction of buses increases the total number of riders. Rather, they show that by large increases in service each year, the bus has taken more and more passengers from the street cars.

Table II presents similar figures to those in Table I but in four communities with rapid transit, i.e., Brooklyn, New York City as a whole, Chicago and Boston, a very different tendency is shown to prevail. These cities are all served by rapid transit lines which have stimulated development in outlying districts and increased local surface car riding. In Boston, where the rapid transit and surface lines are completely unified, and a 10-cent fare pays for a ride on both surface and rapid transit lines, even though more than two buses or cars may be used in making a trip, an apparent decrease in the riding habits is shown. This situation is not comparable to the other rapid transit cities, because in the latter, where a passenger may take two or three rides today to complete his journey, he is counted each time, whereas in Boston he is counted only once. Recent checks indicate that each revenue passenger in Boston actually averages 2.16 rides to complete his journey.

In Brooklyn, where the greatest progress in rapid transit development has been made recently, the surface riding habit has maintained a new high level for the past five years, being 22 per cent higher than in 1918.

Automobiles and Riding Habit

The automobile, with its high degree of mobility and convenient individual service, has stimulated the demand for speed in transportation. While it is a more expensive means of transit than traction or bus service, it saves time and is not subject to the delay caused by frequent passenger stops. Of course, the delays caused by traffic lights, traffic regulations, cross town traffic and general street congestion are encountered. These limitations and the difficulty of finding parking space in congested centers reduce the possible use of the automobile, particularly in the larger cities, where traffic congestion extends over greater areas and the proportion of street parking space is generally less than in the small cities, thereby stimulating the demand for the taxicab.

The riding habit during 1927, in the nine cities discussed, is shown in Table III, and in parallel columns some of the factors affecting riding habit are recorded. These include automobiles per 1,000 population, average fare per revenue passenger and per cent of total car or bus-miles operated by rapid transit, street car and bus. The data recorded are also shown in the chart on page 1070.

These data show that rapid transit is the predominating factor in stimulating riding, for the riding habit in the cities so served exceeds that in the other cities. New York, with the highest riding habit (485) has the highest percentage of rapid transit service, or 70 per cent. Brooklyn, with the second highest riding habit (412) has the second highest percentage of rapid transit service, or 64.4 per cent. Similarly, Chicago comes third and Boston fourth in both riding habit and percentage of rapid transit service.

Table III and the chart on page 1070 also show that the rapid transit cities with the highest riding habit and highest percentage of rapid transit service make the least use of the automobile. New York and Brooklyn, with the highest riding habit and percentage of rapid transit service, have the lowest automobile registration, with Chicago next and Boston fourth.

The only rapid transit city in this country besides the four mentioned in Table II, is Philadelphia, where, as in Boston, the operation of all transit facilities is co-ordinated under one management. Unlike the other cities, however, a large proportion of the taxicab service is co-ordinated with the other transit facilities. Philadelphia has not been included in these tables, because the data required for use in such an analysis of its transportation activities are not available. From published records for the year 1926, however, it is found that the total rides per inhabitant per year on all transit facilities except taxicabs in Philadelphia were 343, and the average fare per revenue passenger was 7.36. The division of total mileage between rapid transit, street car and bus

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TABLE III—FACTORS AFFECTING RIDING HABIT IN NINE LARGE CITIES. 1927

	Riding Habit All Transit	Private Automobiles per 1,000 Population	Aver. Fare per Rev. Passenger in Cents	Per Cent of Total Vehicle-Miles		
				Rapid Transit	Street Car	Bus
Brooklyn	412	71.8	4.99	64.4	34.1	1.5
New York	485	77.7	5.15	70.0	23.6	6.4
Chicago	376	106.4	7.33	28.0	65.0	7.0
Boston	301	125.0	9.27	26.8	63.4	9.8
Cleveland	236	187.6	7.01	....	91.0	9.0
St. Louis	324	154.9	7.45	....	83.2	16.8
Baltimore	265	184.7	7.34	....	95.0	5.0
Cincinnati	244	185.8	8.70	....	70.3	29.7
Richmond	221	78.1	7.12	....	70.4	29.6

TABLE IV—TOTAL MILES OF SERVICE AFTER ENLARGED USE OF BUSES

	Revenue Miles Operated—Three Years, 1922–3–4 Before	Revenue Miles Operated—Three Years, 1925–6–7 After
Five Cities:		
Street cars	429,905,139	418,778,526
Buses	7,300,282	61,610,430
Total	437,205,421	480,388,956

TABLE V—REVENUE RIDES PER INHABITANT IN FIVE SURFACE TRANSIT CITIES BEFORE AND AFTER EXTENSIVE INTRODUCTION OF BUSES

	Before (1922–3–4) By Street Cars	Before (1922–3–4) By Buses	Before (1922–3–4) Total	After (1925–6–7) By Street Cars	After (1925–6–7) By Buses	After (1925–6–7) Total
Cleveland	295	0	295	245	7	252
St. Louis	343	6	349	306	31	337
Baltimore	286	3	289	264	8	272
Cincinnati	235	0	235	200	30	230
Richmond*	236	0	236	195	31	226
Average of above	293	3	296	256	18	274

*For Richmond, 1921 was used instead of 1922, because street cars were not operated for part of the year on account of a strike.

service is not known. However, the foregoing would indicate that the results in Philadelphia appear to be in line with those in the other rapid transit cities.

As already explained, the increased use of automobiles has undoubtedly caused a reduction of the riding habit on the established local service transportation system throughout the country. It is equivalent to the addition of a competing transportation system in the community. Since it is unorganized, however, only fragmentary statistics covering its operation are available, and it is impossible to measure its effect on the business of the established transportation system. The known facts, however, point to certain conclusions regarding the effect of automobiles on riding habit, and particularly that the riding habit in rapid transit cities has increased in the past decade while in the cities not served by rapid transit, it has decreased.

The present trend throughout the country is toward bus and street railway operation within each city. In the cities already listed, the bus service is being operated by the company providing the street railway service in Chicago, Boston, Cleveland, St. Louis, Baltimore, Cincinnati and Richmond. In Boston, Cleveland and Richmond all service has been co-ordinated and is run by one operating company. This method applies to a considerable extent in Baltimore and Cincinnati, and to a lesser degree in St. Louis and Chicago.

Such co-ordination of bus and street railway service is most desirable from the standpoint of both the public and the operating company, since it eliminates or minimizes any cause for the operation of duplicate service, and thus enables the company to develop new territory and serve the public in the most economical manner.

The charts and tables already presented give the general trend in street railway travel during the ten years ending 1927. A special study has been made to determine the effect, if any, on surface car riding of the employment of buses. To do so, the extent of the car

TABLE VI—SHOWING RIDING IN RAPID TRANSIT CITIES

	Revenue Rides per Inhabitant Three Years, 1922–3–4 Before	Revenue Rides per Inhabitant Three Years, 1925–6–7 After
Brooklyn:		
Street cars	213	208
Buses	1	7
Total surface	214	215
Rapid transit	166	192
Grand total	380	407
New York City (all boroughs):		
Street cars	181	167
Buses	19	25
Total surface	200	192
Rapid transit	258	286
Grand total	458	478
Chicago:		
Street cars	279	284
Buses	9	19
Total surface	288	303
Rapid transit	69	73
Grand total	357	376
Boston:		
Street cars and rapid transit*	319	290
Buses	2	15
Grand total	321	305

*No segregation available.

TABLE VII—REVENUE PASSENGERS PER BUS-MILE AND CAR-MILE

City	Average Revenue Passengers per Car and Bus-Mile for Combined Years 1925, 1926, 1927 Street Car	Bus
Brooklyn	9.3	8.9
New York	9.9	6.1
Chicago	6.5	4.1
Boston	6.6*	4.3
Cleveland	7.3	2.8
St. Louis	6.3	3.1
Baltimore	6.3	4.2
Cincinnati	5.1	2.2
Richmond	4.4	3.0
Weighted average	7.3	4.6

*Street car and rapid transit combined.

riding just before and just after the introduction of buses has been compared in the cities whose traffic has been studied in this report.

In Cleveland, Cincinnati and Richmond, bus operation began in 1925. In St. Louis and Baltimore, there was some bus operation prior to 1925, but the period of rapid expansion began in that year. Therefore, a comparison of the three-year period beginning in 1925, when bus service was developing rapidly, with the three previous years when it was inconsequential, should be of importance in ascertaining the effect of the use of the bus on surface transportation. The years comprising these two three-year periods are all normal with no peak, such as occurred in 1920, and no slump as in 1921. The total miles of service rendered during each of the three-year periods in the foregoing group of cities, before and after the enlarged use of the bus, are given in Table IV.

The total service rendered by street cars and buses increased from 437,205,421 miles to 480,388,956 miles. Coincident with this large increase in service, the total riding actually dropped from 2,894,034,734 to 2,826,252,975, or 67,781,759. Although the new bus service reached into many districts considered as inadequately served by street cars, much of it was competitive.

The Cities With Rapid Transit Compared

A comparison of the annual rides per inhabitant, showing the average of the three-year period ending in 1924 with the three-year period ending in 1927 for the rapid transit cities before and after enlarged use of the bus, is given in Table V and one chart on page 1073.

Table VI shows that in the Borough of Brooklyn and in the City of New York as a whole, where rapid transit

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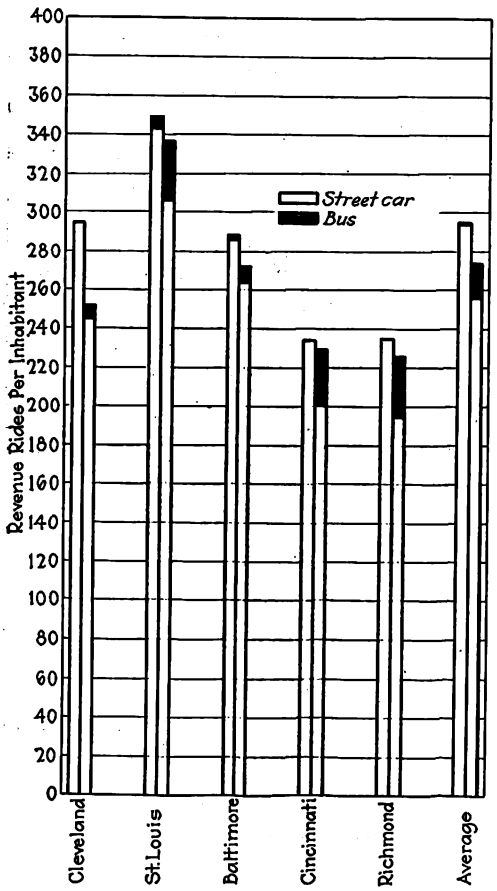
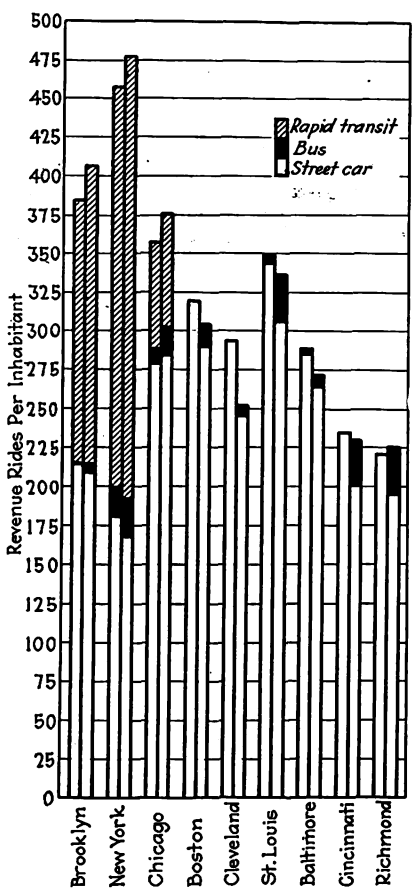
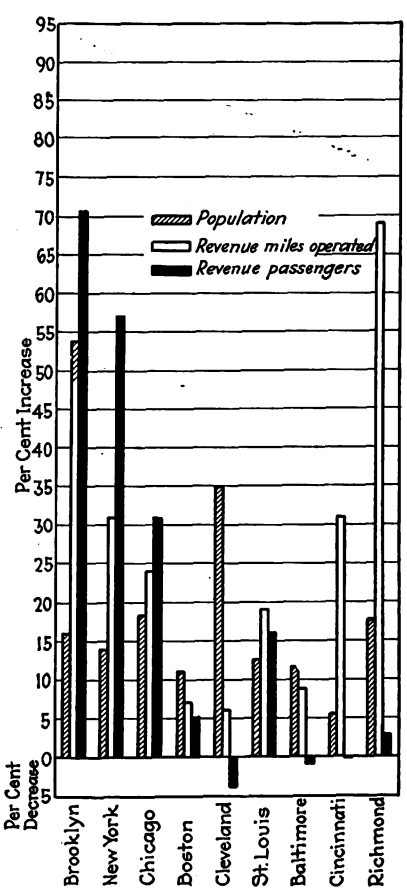


Annual street car and bus rides per inhabitant, three years ended with 1924 (first column) and three years ended with 1927 (second column)



Annual street car, bus and rapid transit rides per inhabitant, three years ended with 1924 (first column) and three years ended with 1927 (second column)



Per cent increase in population, miles operated and revenue-passengers for ten-year period in nine cities

facilities are the greatest and this method of transit is expanding rapidly, not only does the riding habit continue to grow but it is much higher there than elsewhere.

Chicago, with its more limited system of rapid transit service, follows Brooklyn closely in total riding habit, and like Brooklyn and New York the total riding habit of the second period shows a substantial increase over the riding habit for the first period, in direct contrast with all the cities served by surface lines only, in which the second period, with its enlarged use of the bus, shows a decrease.

Boston, the fourth rapid transit city, apparently indicates the lowest total riding habit of any of the rapid transit cities. One reason for this, as has been already shown, is that the rapid transit and surface lines are completely unified into one fully co-ordinated system where one 10-cent fare entitles the passenger to a free transfer between all classes of service. Joint prepayment inclosures admit patrons to both surface and rapid transit cars and this prevents the segregation of street car from rapid transit passengers. Bus passengers, however, are a matter of record and are indicated.

The average number of revenue passengers carried for the three years, 1925, 1926, and 1927, for each car and bus-mile operated in the cities indicated, are set forth in Table VII.

Conclusions

From an analysis of data compiled, the following conclusions may be drawn:

1. That urban transportation should be separated into two classes; rapid transit and surface. Rapid transit is a fast service for the long distance rider on an unobstructed right of way, while the street surface lines, whether street car or bus, render a slower service.

2. Cities having the largest proportion of rapid transit service have the highest riding habit and the lowest registration of automobiles per thousand population.

3. The building of rapid transit facilities changes the function of the surface line where affected, from long haul carriers to local or feeder lines.

4. Expansion of rapid transit facilities may change the character of the riding so much that the local and feeder service riding exceeds the surface line loss in long haul passengers.

5. The total revenue rides per inhabitant are increasing faster in cities with rapid transit facilities. This is due not entirely to the fact that people are taking additional journeys but also because they will use both rapid transit and surface facilities in completing a trip where the combination saves time.

6. Buses perform a function similar to the street cars in that they operate on the street surface and at a similar speed.

7. Where the territory is already served by street cars, the addition of bus service does not stimulate any considerable amount of new business.

8. The increases in the average fare per revenue passenger, in the cities served by rapid transit, have had a minor effect on the riding habit for the riding habit has continued to increase. In the cities served by surface lines only, the riding habit has on the average held up until the fares increased about 30 per cent above the 1918 level. With further increases in fare, however, the riding habit has generally decreased.

9. In all the cities served by rapid transit except Boston, which for reasons already stated is not strictly comparable with the other cities, the riding habit has increased faster than the service given, whereas in every case where cities are served with street cars and buses only, the riding has not kept pace with the service offered.

10. In the cities served by surface transit only, the demand for rapid transit service has been met by the use of the automobile and the riding habit of the surface lines reduced thereby, for, while rapid transit lines serve to create short haul riding on surface lines, automobiles do not.

11. In cities depending only on surface transportation, when buses have augmented the street car, the result has been that the former riding has been divided between the two types, with little, if any, addition to the total.

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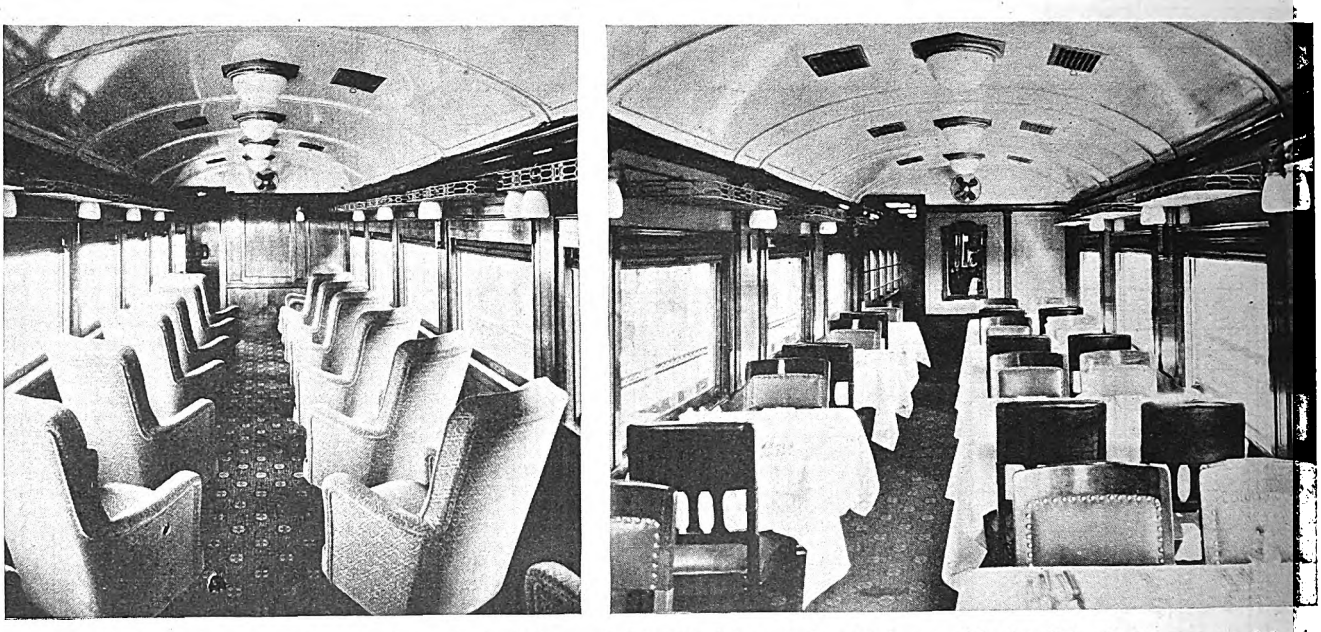

The easy chairs in the new parlor car, shown at the left, are finished in blue plush. Richness with simplicity is the note struck by the North Shore line in the new diners, shown at the right

More New Cars for North Shore Line

TWO additional dining cars and one parlor-observation car, ordered by the Chicago, North Shore & Milwaukee Railroad from the Pullman Car & Manufacturing Corporation, have been delivered and are now in regular service between Chicago and Milwaukee. Altogether, eighteen new all-steel cars have been placed in high-speed passenger service by the North Shore on its main line this year. Besides the three cars just mentioned, fifteen passenger motor cars embracing the latest devices for the comfort and safety of the passengers, including the new easy chair type seats upholstered in gray Byzantine plush, were delivered by the same company recently.

The three cars just placed in service are the last word in travel luxury. The diners, seating 24 persons each, are finished in buff inside with walnut panels and have ornamental sidelights. Their elegance of finish is emphasized by the absence of decorations, a beveled mirror on the wall adjoining the kitchen being the only embellishment.

The parlor-observation car has seventeen of the latest type revolving easy chairs finished in light blue frieze plush. The interior is finished entirely in walnut. The carpeting in both the parlor-observation car and the diners is in black and gold, with felt padding underneath.

New equipment costing over $900,000 has been placed in service by the North Shore line during 1928.

Wheeling Traction Company Spreads Holiday Spirit

WITH the view of aiding merchants and post office employees by inducing the public to shop and mail early, as well as to spread the spirit of the holiday season, the Wheeling Traction Company, Wheeling, W. Va., has placed a "Christmas Car" in operation over the various lines in the city. Painted in the traditional Christmas colors, red and green, brilliantly illuminated at night, and with the slogans "Shop Early," "Mail Early" and "Ride the Trolleys" displayed in gold lettering along the sides, the car presents a very attractive appearance, and has been the object of much favorable comment. Blazoned along the letterboard at the top of the car is the legend "Merry Christmas and Happy New Year." The front dash carries the suggestion that "Early Buyers Get the Best." The rear dash carries the injunction, "Mail Early, Direct with Care." In addition to being operated in Wheeling the car will make appearances in Moundsville and Bellaire, which are also served by the Wheeling Traction Company.

"Christmas Car" of the Wheeling Traction Company

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The smaller motor coaches are well adapted for operation in the heavy downtown traffic of Detroit

De Luxe Bus Lines

Now Serve Detroit

Four of six routes have been started and 160 parlor-type coaches ordered to render service replacing that formerly offered by the jitneys

UNUSUAL, indeed, was the step taken by the Department of Street Railways of Detroit, when it decided to establish several de luxe bus routes to serve the residents who previously had used jitneys. The railway has decided not only to serve the four principal routes over which the jitneys formerly operated, but also to extend other routes into new sections of the city. A total of 160 small-capacity parlor coaches have been ordered for use in this service. Of this number, 120 are Grahams and 40 are Yellows. Aside from the magnitude of this venture into a new field, the program is of importance from a co-ordination standpoint. The jitneys proved to be serious competitors of the Department of Street Railways, and their removal from the streets and the substitution of a similar service by the electric railway should eliminate several difficulties. While most of the de luxe buses will travel over streets also served by street cars and buses, they will give essentially a different class of ride and will have as customers the former patrons of the jitneys.

Public Willing to Pay Extra Fare

The Department of Street Railways on Nov. 25 inaugurated the first of the lines which have been definitely decided upon. This first line extends over Woodward Avenue from Palmer Woods, its outer terminus, to the downtown section of Detroit, operating part of the way over Cass and Second Avenues. The fares charged are comparable to those of the former jitneys: 10 cents from downtown to Grand Boulevard, 15 cents from down-

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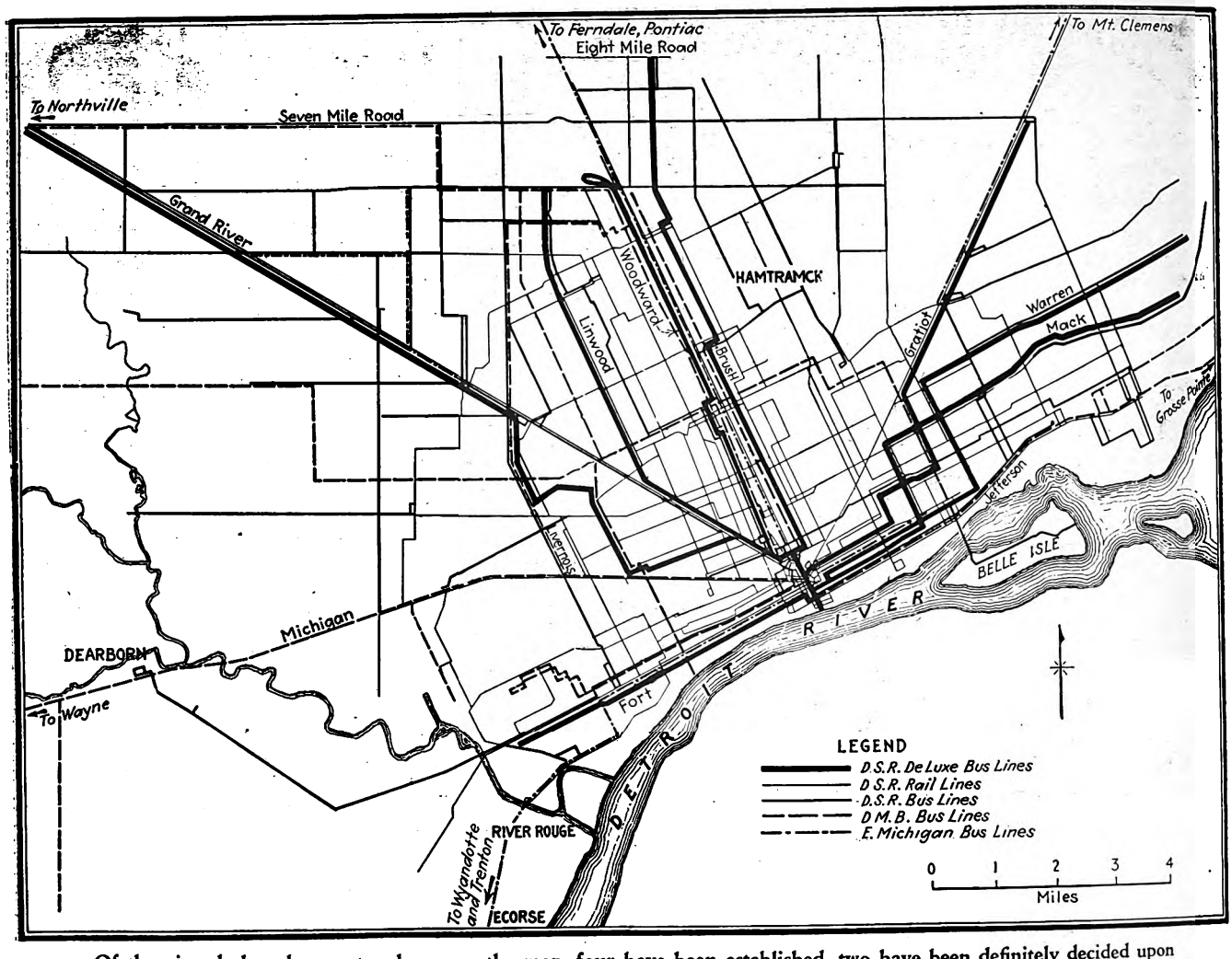

Of the nine de luxe bus routes shown on the map, four have been established, two have been definitely decided upon and three have merely been proposed

town to Highland Park, and 20 cents from downtown to the Six Mile Road. According to General Manager Del A. Smith, the line is meeting with favorable and immediate response from the public, proving conclusively that they are willing to pay the graduated fares of 10, 15 and 20 cents for this type of service. Because the service proved so popular on Woodward Avenue, the original eighteen coaches placed in service could not carry the full load and the company had to increase the number of buses on this route.

On Dec. 1 operation was started on the Grand River line, the second of the six routes. The number of buses was increased as they were delivered from the manufacturers. This particular line leaves the downtown section by way of Grand River Avenue, but branches for part of the route passing over Ash Street, West Grand Boulevard, Milford, Beechwood and Woodside Avenues, again joining Grand River Avenue at a point south of Livernois Avenue. This increases the distance by ¾ mile, but it is believed that better time is possible because of the lighter traffic encountered.

Since the starting of the Woodward Avenue and Grand River Avenue lines, two others have been established, one on Jefferson Avenue and another on Mack Avenue. The outer extremity of the Jefferson line is at Wayburn Avenue. The Mack Avenue route leaves the downtown section by way of Congress Street, goes north on Elliott Avenue and then out Mack Avenue. In addition to the four routes established, two others have been definitely decided upon, making a total of six routes. These two are the Fort Street and Linwood Avenue lines. The Fort Street line will terminate at Woodmere Cemetery. The Linwood Avenue line will leave the downtown section by way of Grand River Avenue and extend out Linwood Avenue to the Six Mile Road.

Three other routes have been proposed but no decision has been made on them as yet. The three routes are: Out Brush Street and Oakland Avenue to the Eight Mile Road; from Gratiot Avenue and the Seven Mile Road to Gratiot and East Grand Boulevard, thence downtown via the Boulevard, Verner Highway, McDougall Avenue and Macomb Street; out Lafayette Avenue East, Van Dyke Avenue and Warren Avenue. A line to Windsor, Ontario, may be considered later.

Due to the zoning arrangement, inbound buses will use the pay-as-you-enter system and the outbound vehicles the pay-as-you-leave. No interchange of transfers is permitted, either between the various de luxe lines or between the de luxe lines and the street cars or regular buses of the municipal system. Officials of the Department of Street Railways are considering the issuance of pass cards to be purchased by patrons and to be good for a certain number of rides, the card to be punched by the bus operator for each ride. Printed schedules will be distributed to the patrons as soon as the de luxe lines are completely established.

The buses ordered include 120 six-cylinder, 15-passenger Grahams and 40 eight-cylinder, 17-passenger,

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model W Yellow parlor cars. The added equipment will be paid for on a rental basis, the rate being 20 cents a mile for the first four months, and 11½ cents a mile thereafter. The Department of Street Railways guarantees a minimum of 100 miles a day and has the option of returning the vehicles at the end of four months. At the end of this period, payment can be completed either on the rental basis or it can be paid in full at any time.

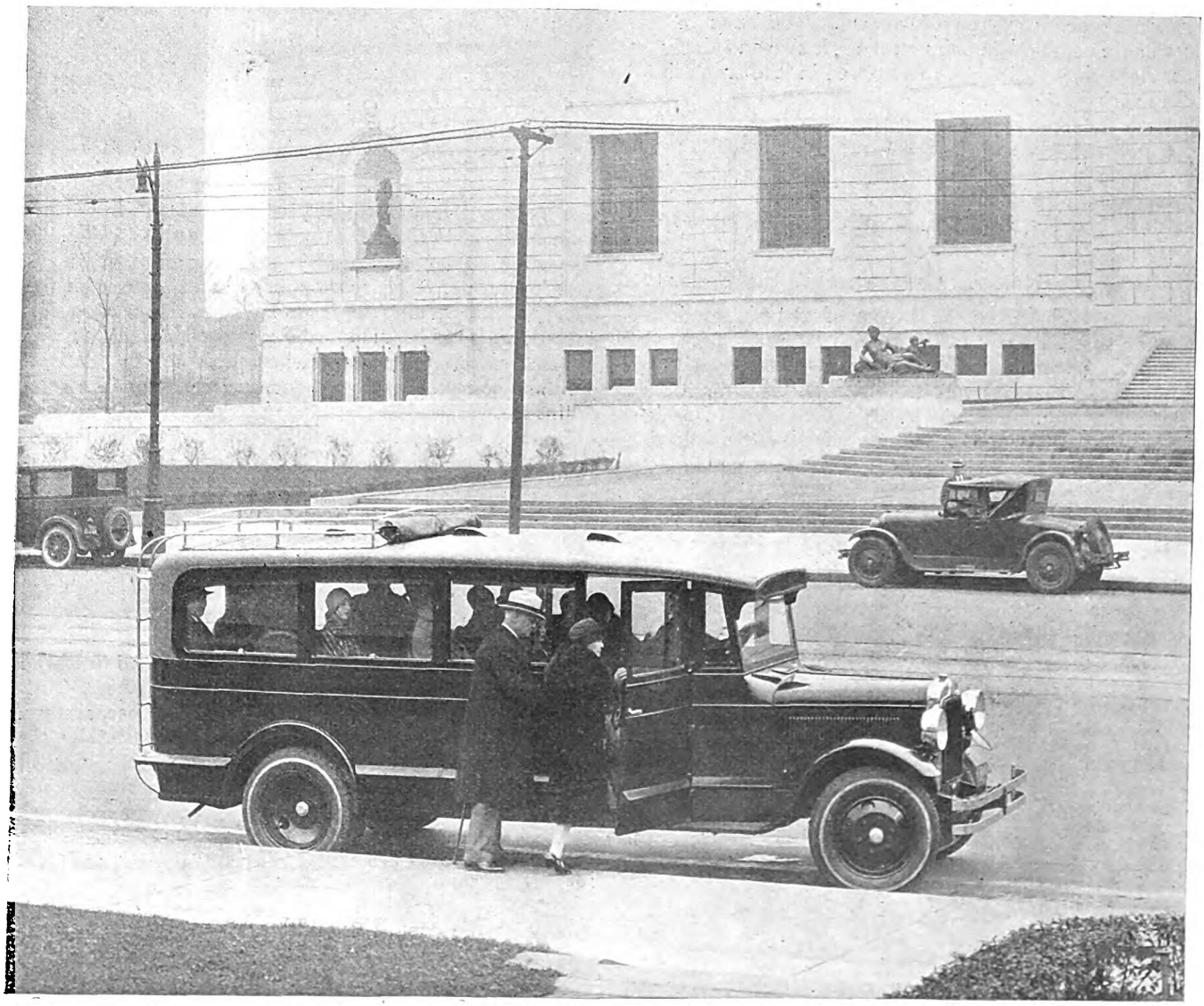
The Graham Brothers parlor coach has many refinements to add to the comfort of the passengers. The seats are upholstered in Spanish leather and have deep spring bases and air cushions. The bus seats fifteen passengers, exclusive of the driver, so that plenty of room is provided. There are three double seats on the left side of the bus and three single seats on the right side. Four more seats are located at the rear and one over each wheel housing.

The bus is heated by a fan blower system. Ventilation facilities include an electric fan opposite the door, ventilators in the cowl and roof, and a sloping one-piece windshield which has V-type ventilating wings at each side. Among the safety features are the Lockheed hydraulic four-wheel internal expanding brakes, a hand brake which operates on the propeller shaft, an emergency door at the rear of the coach and a non-skid entrance step.

A distinctive color combination is used to distinguish the de luxe buses from the others operated by the company. The body is finished in two tones of cardinal red and the top in beige. The wheels are red, in contrast to the fenders and body base of black. Black and gold stripes give a finished appearance to the exterior. The interiors are trimmed with Spanish leather to correspond to the upholstery of the seats. All windows are of plate glass and are equipped with roller anti-rattlers both inside and out.

The flooring which is of oak is laid crosswise and is covered with linoleum. The usual push-button switches of the stop signal system are replaced by a cord atached to a buzzer. The interior is illuminated by 6-cp. flush-type dome lights. A suggestion of the Pullman is given by the mirrors set in the window posts. The buses are equipped with six-cylinder motors and have a four-speed transmission. The nut-and-lever type of steering gear is used, with varying ratios to make the driving easy.

The 40 Yellow coaches ordered are the 17-passenger, type W parlor coach, especially designed for de luxe service. This type is powered by the Cadillac eight-cylinder, V-type engine, modified to meet the requirements of motor coach service. Other distinctive points of this coach are the four-wheel, four-segment service brakes; the external, contracting emergency hand brake,



The first of the de luxe bus lines was started on Woodward Avenue on Nov. 25

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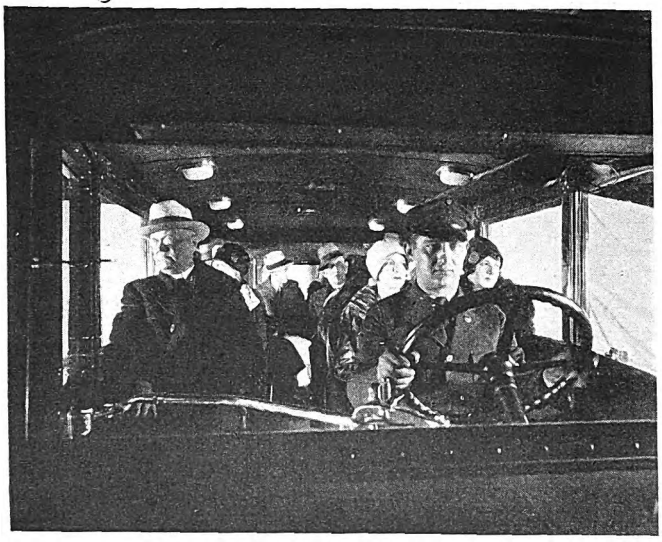

The Graham parlor coaches are designed to give the utmost in comfort to the passengers

working on two gun iron drums on either side of the propeller shaft bearings; the underslung, worm-driven rear axle of over-size capacity; unusually long and wide springs, with an improved type of suspension for the front springs; a four-speed transmission; and steering gear designed for ease of control. The seats in this coach are arranged in pairs on the left side and singly on the right side. They are upholstered in leather and have deep spring cushions.

Only the most courteous and dependable drivers of the 500 now employed by the Department of Street Railways are being picked to operate the de luxe buses. The driver's uniform chosen for this service is of a dark cardinal red shade with a French style fatigue cap to match.

Status of Jitneys Contested for Six Years

Jitney operation on the streets of Detroit, conducted for the past six years under the protection of a series of injunctions, was terminated by the Police Department acting under a decision of the Michigan Supreme Court. The jitney ordinance was signed by the Mayor of Detroit on May 29, 1922, and it became effective the following October. On Oct. 24 of this year the Michigan Supreme Court in a majority opinion, upheld the validity of the ordinance and indicated that further legislation aimed to delay enforcement would not be tolerated. The ordinance prohibited the operation of jitneys on Fort Street East and West, Michigan Avenue, Grand River Avenue, Woodward Avenue, Jefferson Avenue, Cass Avenue, John R Street and the parks and boulevards. The Supreme Court's opinion was handed down on the city's motion to dismiss the bill of complaint of the Red Star and the Blue Ribbon Jitney Drivers' associations. The court also took up the city's appeal, asking for a writ of mandamus to compel the circuit judge to dismiss his injunction under the protection of which the jitneys were operating. The court opinion stated that with the dismissal of the bill, the injunction based upon the bill goes down with it. The order dismissing the writ was signed by the circuit judge when presented by the corporation counsel, leaving the city free to enforce the ordinance.

Forty type W Yellow parlor coaches, seating 17 passengers, were ordered for the new de luxe service

Because they had taken steps to obey the ordinance, 30 jitneys were granted permits early in October. These continued to run on Hamilton Avenue, from Library Square downtown to the southern limits of Highland Park, following the ousting of the others on Oct. 24. The route paralleled to a large extent one of the D.S.R. trolley lines. Recent steps, however, were taken by the Mayor of Detroit to banish jitney service of any kind. In answer to the proposal, the City Council recently passed an ordinance to prohibit the operation of so-called jitneys on the streets, avenues, boulevards and public places of Detroit. This measure provides against the operation of jitneys on any city

A total of 160 buses were ordered, 120 of which are to be 15-passenger Grahams of the type shown above

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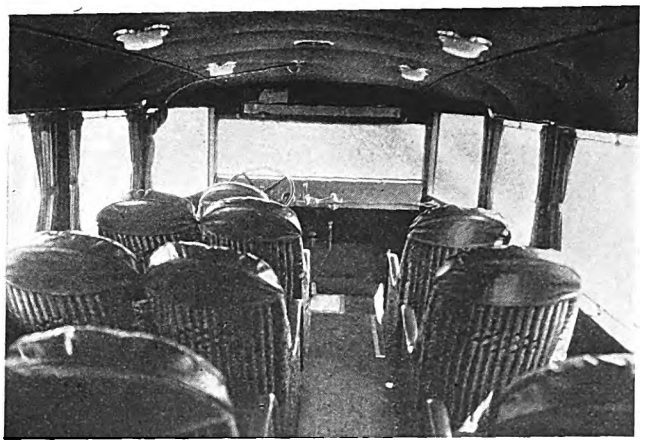

The attractive interior of the type W Yellow parlor coach gives an atmosphere of refinement

street or any thoroughfare mentioned in the original ordinance.

At the time the Supreme Court decision was put into effect, about 1,000 jitneys were being operated on the city streets. Only about 500 of these were involved in the six-year legal proceedings. The others were newcomers, usually referred to as "wild cats," that began to appear during June and July of the present year. The general scheme was to follow a route that led into some important downtown point where regular loading points with starters were established. Starters were also maintained at the outlying terminals to control the drivers, establish spacings, and exercise general supervision. Parking space was available at the outlying terminals, but downtown the jitneys would often be making a circuit on near-by streets and waiting their turn to get into the stand and pick-up passengers.

Once the jitneys were removed, additional service was given by the Department of Street Railways. It rented 40 trolleys from the Eastern Michigan Railways and 30 cars and trailers from the Cleveland Railway. Service was augmented particularly on the Woodward, Jefferson, Grand River and Fort Street lines, where the majority of jitneys operated.

British Tramway Traffic Increases

STATISTICS of the tramway undertakings in Great Britain are published each year by the Ministry of Transport. These figures from tramway companies for the year ended Dec. 31, 1927, and for the municipal lines for the year ended March 31, 1928, have just been issued. They show 233 systems, of which 167 are owned by the municipalities and 66 by private companies. The number of miles of route was 2,514, a decrease of 40 miles compared with the previous year.

The total capital expenditure at the end of the period mentioned was £99,913,760, an increase of £1,303,255, as compared with the previous year. The revenue from operation during the year was £27,751,504 and the operating expenses £21,943,147. The net income was £5,808,357.

The passengers carried during the year were 4,705,842,932, an increase of 5.51 per cent as compared with the previous year. There was also an increase of 4.70 per cent in car-miles run, the figure for the year just past being 396,554,545.

The report also shows that there were eleven trackless trolley lines, the length of route operated amounting to 111 miles, an increase of 24 miles. The number of passengers carried on these lines was 80,112,970.

Diagonal Versus Parallel Parking

AN INTERESTING analysis of the effect on street traffic of diagonal and parallel parking has recently been made in the city of Houston, Tex., by the Beeler Organization. The report relates to Main Street, the principal business thoroughfare of Houston, and in a sense is a supplement to the traffic report on that city published in abstract in the issue of ELECTRIC RAILWAY JOURNAL for Dec. 8.

Main Street is 60 ft. wide from curb to curb, and at the present time, diagonal parking is followed. With this kind of parking, a maximum of 378 cars can be accommodated in the nine blocks of the business district. With parallel parking, a total of only 288 cars could be accommodated in the same nine blocks. The figures in each case represent the maximum when all of the curb length was used, but normal restrictions on parking in front of fire hydrants, at the entrances to public buildings and some stores, and some obstructions due to building operations will reduce these totals to about 284 and 216, respectively. If the parked cars were changed each hour during the ten hours of the day, 680 additional cars could be accommodated daily by the diagonal system of parking, but this number represents only 1.3 per cent of the 51,824 passenger cars in the city.

With diagonal parking at 45 deg. the roadway left open to traffic is reduced 30 ft., which is theoretically sufficient for three streams of traffic, but owing to the varying lengths of vehicles and the need for drivers to be on the lookout for cars backing out of their stalls, moving traffic is practically limited to two streams.

With parallel parking, on the other hand, 46 ft. of clear roadway would be open, allowing four traffic streams free to travel at a brisk rate between the comparatively smooth lines of the parked vehicles. Parking at an angle of 30 deg. at the curb reduces the standing capacity to about that of parallel parking, and reduces the effective roadway to almost the same extent as the 45-deg. angle parking.

It will be noted that the 30 per cent additional capacity provided by the 45-deg. angle parking requires a street area practically double that required by parallel parking. Parallel parking requires 14 ft. of street width, while angle parking requires 30 ft. In other words, the additional 68-car capacity obtained from diagonal parking consumes a street area 16 ft. wide throughout the length of the nine blocks, which if devoted to moving traffic would provide space for two additional traffic streams with an hourly capacity of approximately 2,000 cars. The volume of traffic which can enter the Main Street business section is therefore cut approximately in half by angle parking. Angle parking also increases the hazard of driving, reduces freedom of movement and makes it impracticable to operate an express bus line on Main Street, as has been proposed. Such a line, it is estimated, would carry approximately 2,685,000 people in and out of the Main Street business section during the first year of operation.

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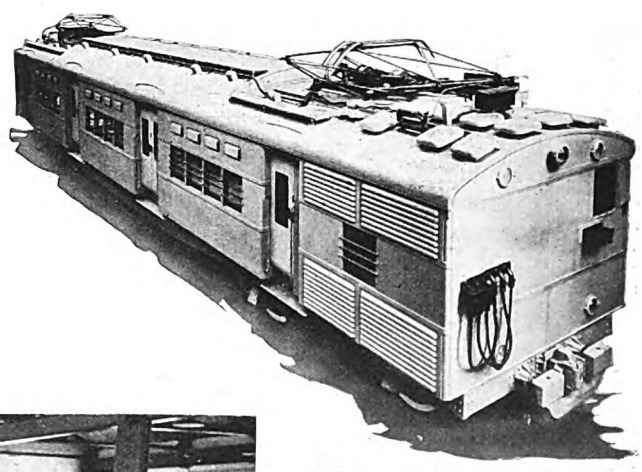
Bombay Electrifies Its Suburban Service

Need for increased capacity was determining factor in electrification of 23-mile section of Bombay, Baroda & Central India Railway. Multi-side-door cars are used. Stations remodeled and signals installed

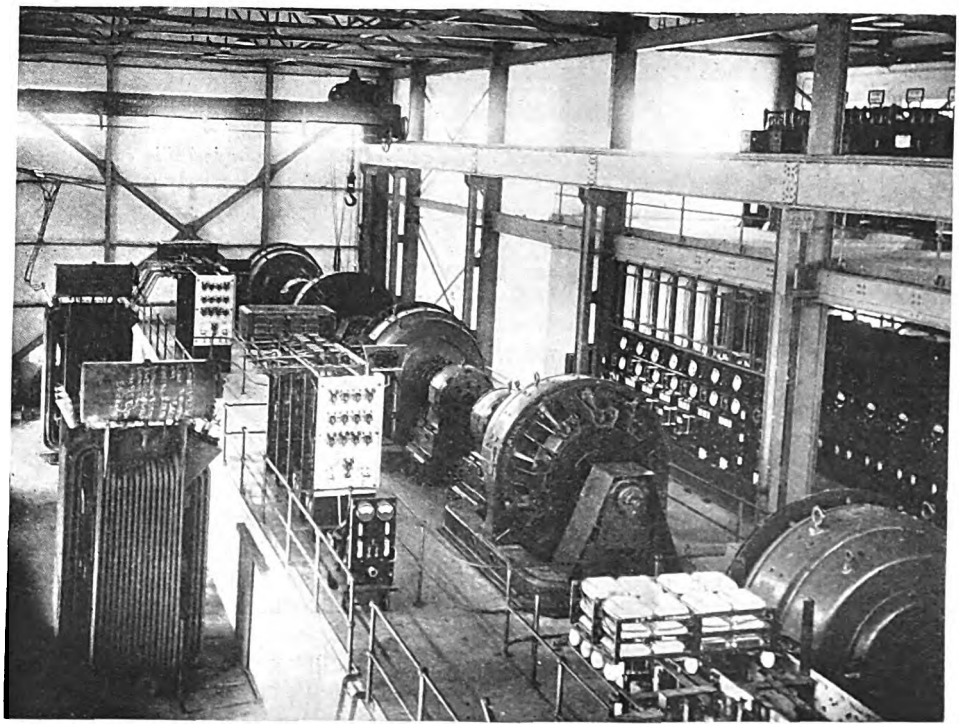
ELECTRIFICATION of suburban service on the Bombay division of the Bombay, Baroda & Central India Railway is one of the recent transportation developments in the Orient. Business on this division has grown at a very rapid rate during the past twenty years. No record is available to show the number of passengers carried on this division prior to 1888, but in that year the total was 10,000,000. This figure is useful in reviewing the statistics of more recent years. In 1914, 24,000,000 passengers were carried; in 1918, 30,000,000, and for 1927 the figure has been put at 38,000,000 passengers. During a boom in 1922, when rents in the city of Bombay rose to an excessive level, no less than 45,000,000 people were carried, causing a severe test on the capacity of the division which at that time had no modern equipment for the acceleration of train movements. It has been this continuous increase in demand for transportation which made necessary the conversion of the road from steam to electric traction. Opportunity was taken of this change to make other permanent improvements, including a remodeling of most of the local stations, installation of signals over the entire suburban section of 23 miles, and the construction of a number of over-bridges to do away with grade crossings.

According to the original plan, it was hoped that electrification would have been completed in 1926, but the opening did not take place until early in 1928. The power required is secured from the hydro-electric stations in the Western Ghats, some 100 miles from Bombay. It is transmitted to Bombay as three-phase alternating current at 110,000 volts and 50 cycles, and is first transformed at the substations to 22,000 volts and then converted to direct current at the trolley voltage of 1,500 volts. The converters in the three substations are controlled from one point. The 1,500-volt direct current is distributed to the cars by two overhead wires with catenary suspension.



Motor coach on the Bombay, Baroda & Central India Railway

The cars are of steel and entirely new. They were supplied by the English firm of Cammell Laird & Company. The design allows for free circulation of air between the inner lining and the outer shell of the car. They are equipped with wide sliding doors of aluminum alloy construction. The electrical equipment was supplied by the British Thomson-Houston Company, Ltd., each motor car being equipped with four 750-volt ventilated interpole motors,



Interior view of Bandra power station

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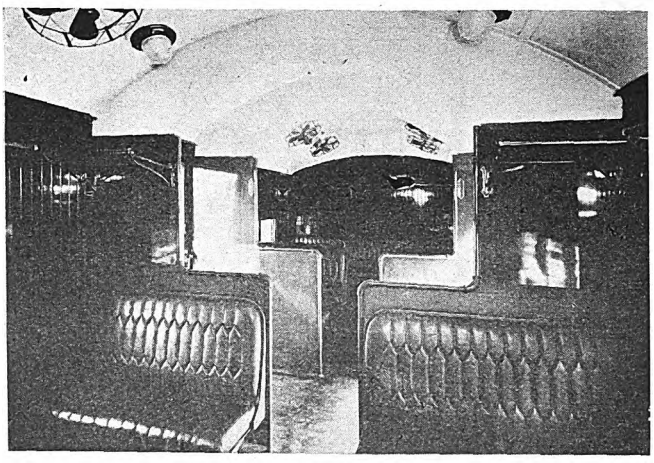


Interior view, showing first-class compartment

which are permanently connected in two groups of two motors in series.

Inside, the cars are lined with teakwood throughout. The seats of the third-class coaches are also of teak. In the first-class coaches upholstered seats are used. Altogether there are 160 cars which are in service coupled in units of four, one motor coach and three trailers. These units can be operated separately or coupled to form full trains of eight cars. The seating capacity of an eight-car train is approximately 1,000 persons and is 33 per cent greater than the capacity of the previous steam trains. With the equipment of four motors, having a combined rating of 1,100 hp., on each motor car, a fully loaded train unit of three trailers and one motor car can be accelerated at 1 m.p.h.p.s. The control equipment provides for automatic acceleration. The cars are 68 ft. in length and 12 ft. wide, as compared with a width of 10 to 10½ ft for the steam cars.

Railway Electrification Proceeding in Morocco

PROGRESS in railway electrification is being made rapidly in Morocco, where water power is plentiful and all coal has to be imported. Already, the Morocco Railway Company has about 200 km. (130 miles) of track equipped with electric power. The entire system in operation by electricity and steam comprises about 583 km. (265 miles), with projected extensions of nearly the same length. The railway is owned by a French company with largely the same interests as control some of the principal trunk line railroads in France.

At present the lines are receiving a considerable portion of their power from steam stations, but a large hydro-electric station is being built on the Oum-er-Rebia River, the principal river in western Morocco.

Direct current at 2,000 volts is being used, and ten locomotives and the same number of motor cars have been purchased. The electric locomotives are 38 ft. 9 in. over all, weigh 160,000 lb. each and have an hourly rating of 1,340 hp. Each motor car is equipped with four 140-hp. motors and is capable of hauling two trailers. Further particulars are given in a paper contained in the May-June Proceedings of the French Institution of Civil Engineers. It was contributed by H. Parodi, consulting engineer of the Morocco Railway Company and of the Orleans Railway Company of France.

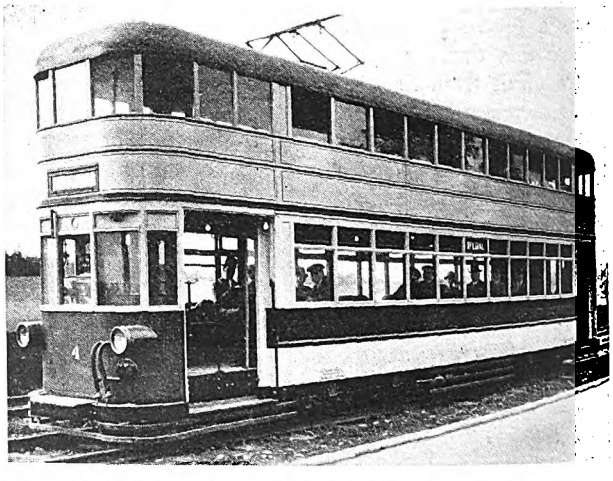
Oldest Railway in England Is Electrically Equipped

Built as a horse car line in 1804, it celebrates its 124th birthday by adopting electric power and buying new cars

THE oldest railway now in operation in Great Britain, possibly in the world, is a 6-mile line between Swansea and Oystermouth in Wales. It is popularly known as the Mumbles Railway. This road was authorized by an act of Parliament dated June 29, 1804, and completed shortly after. Several railway lines were incorporated and constructed in England before this date, but all of them have either been abandoned or absorbed into larger systems. But for the past 124 years the Mumbles Railway has retained its individuality.

As first constructed, the rails were of angle iron in 3-ft. lengths, set into granite blocks, spaced 3 ft. apart. As the rail was flanged, there were no flanges on the wheels. The first change was to rails weighing 28 lb. to the yard, then to 56-lb. rails, and then to the present standard of 85-lb. rails.

Originally the road was built to haul iron ore and limestone from some mines and quarries that were at the end of the line, but in 1816 passenger cars were added.



Britain's oldest railway has just adopted this car

The mines and quarries were exhausted and abandoned many years ago and the principal business of the road now is passenger transportation.

Up to 1877 all cars, including the freight cars, were hauled by horses. In 1877, however, the motive power was changed to steam. With steam, the type of passenger cars retained in service was similar to those ordinarily used for horse-car service elsewhere at that time; that is to say, they were light four-wheel, double-deck cars with the upper deck open.

This year, steam has been abandoned in favor of electric power. The new cars are of the British double-deck, double-truck type, with a capacity for 48 passengers on the lower deck and 58 on the upper deck. A special feature of car design was introduced, however, because of the unusual physical features of the route, which has the sea on one side and a highway on the other throughout its entire length. The result is that as the cars have a stub terminal at each end, both entrance and exit are on one side of the car only, with no doors on the other side.

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The clinic is well supplied with apparatus and instruments needed in surgical practice

Interborough Cares for Medical and Surgical Needs of Employees

WORK done by the medical department is a feature of the welfare activities of the Interborough Rapid Transit Company. The headquarters of this department is on the ground floor of the company's new shop and car yard at 147th Street and Seventh Avenue. The medical department takes care of the medical and surgical needs of 16,000 employees, as well as those of their wives and children. A record is kept of the cases treated, and in 1927 treatments were given to 3,555 patients. The average number of treatments per patient was slightly less than six.

At the 147th Street carhouse the department has a clinic with three examining rooms, sterilizer and other equipment for operations, a number of therapy aids in the way of electrical machines, etc. One of the company's full time physicians, as well as nurses, is always in attendance or within quick call. Here are all the remedies and appliances needed for prompt treatment in case of accident in the shop. There is also another clinic at the company's shops and car yard at Lexington Avenue and 98th Street.

All extensive surgical work is conducted at the Post Graduate Hospital at Twentieth Street and Second Avenue. The company has an arrangement with this hospital for accommodations, and Dr. John J. Moorhead, chief surgeon of the company and head of its medical department, is also professor of surgery at the Post-Graduate Hospital and Medical School. A male ward of ten beds is maintained at this hospital for the benefit of the male employees of the company. After a company patient at this hospital is able to leave, he is treated at one of the company's clinics.

The medical department includes six full-time physicians and surgeons besides Dr. Moorhead, who performs the operations at the Post-Graduate Hospital. Besides these physicians, the company has an arrangement with 28 others who give part time. Their offices are scattered about the territory in which the employees live. They

*FORM L-31

Employee's Surgical Treatment Card

OFFICE CALLS					HOUSE CALLS			
1	2	3	4	Name _____	1	2	3	4
5	6	7	8	Address _____	5	6	7	8
9	10	11		Badge No._____ or Pass No._____	9	10	11	
12	13	14		Treated by_____	12	13	14	
15	16	17		At _____	15	16	17	
18	19	20		Diagnosis_____	18	19	20	
21	22	23		_____	21	22	23	
24	25	26		Began treatment_____	24	25	26	
27	28	29		Discharged_____	27	28	29	
30	31			Record Book_____ Folder_____	30	31		
				_____ (over)				

Name	Badge	Occupation
Address	Co.	Shop
Date of accident	Began Treatment	
Cause of accident		
Diagnosis		
X-Ray		
Treatment notes		
Treated by		

Two forms found convenient for recording data about patients; at left is that used by the local doctor, at right that used in the clinic

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may be called through the medical department to attend or give medical advice to any employee.

When a case of sickness develops at home and is reported to the department, the procedure is as follows: A visit is immediately made to the home of the employee by the company's head nurse or one of her assistants. This nurse has authority to care for the medical and surgical needs of the patient by sending him to a hospital or by calling in a physician. She also has authority to see that the family is cared for during the absence of the patient if it should be either the father or the mother of dependent children. She also has authority to advance a loan for any necessary expenses. If the injury or sickness develops while the man is at work, he is sent to the clinic by the foreman in charge.

Records are kept of each case treated. Two of the cards used for this purpose are published. The first is known as the doctor's office record, and covers the cases treated in any outside office. The other is used when the case is treated in one of the clinics. So long as patients are under treatment these cards are kept in a file known as the active list. This list usually includes about 500 cards.

In another record all cases are classified by nature of trouble. From this record the accompanying table has been prepared.

TABLE SHOWING CASES TREATED BY I. R. T. MEDICAL DEPARTMENT IN ONE YEAR

Diagnosis	Number of Cases	Average Number of Treatments	Average Time Lost, in Days
Lacerations	1,039	5	1
Contusions	543	3	2
Medical cases	362	4	8
Sprains	235	3	1
No evidence of injury	235	2	1
Infections	204	7	3
Burns	175	8	6
Eye cases	91	2	1
Punctured wound	86	3	5
Back injury	67	3	4
Hernias	52	8	30
Foreign bodies	39	2	1
Traumatic amputation	6	13	17
Fractures	121	15	40
Total or average	3,255	6	..

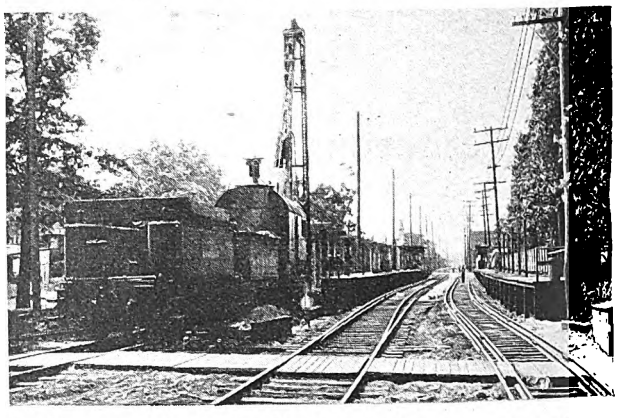
After an employee has been on the sick list, he must pass a physical examination before returning to work, to determine whether he is again physically fit for his job. Foremen, instructors, nurses and others who are brought into touch with the employees have authority to call the attention of any employee to the need for a physical examination. Other than this there is no definite period for physical re-examinations of employees in service. The men are encouraged, however, to take such examinations at any time they feel it necessary, by being assured that no one will lose his position with the company because of physical incapacity in any particular. If an employee cannot be kept at his existing job for physical reasons, he will be assigned to another. The company always has enough openings as storekeepers, watchmen, or for work at some passenger station, to take care of any trainman or other employee no longer fitted for his existing work. If an employee has been with the company for 25 years or more he is entitled to a pension.

A service of the medical department not heretofore mentioned is the contribution frequently to the employees' magazine, the *I.R.T. News,* of a column on health hints. This column is conducted by Dr. Henry Green, one of the company's surgeons, and in this column he answers questions on medical topics sent in by mail, unless a personal answer is requested by the correspondent. He also contributes to the *I.R.T. News* from time to time, articles on such practical topics as causes for common ailments, remedies for and prevention of them.

Grade Separation Project in Evanston Progressing

STEADY progress is being made on the elevation of the Chicago Rapid Transit Lines' right-of-way between Church and Isabella Streets, Evanston, Ill., on the north side division. Construction of the temporary trestle for the north-bound track was completed the first week in October and north-bound traffic is now being routed over this structure. Work has been started on the trestle for the south-bound track and when this is completed all trains will be operated over the temporary structures. It was expected that both trestles would be completed by the end of the year.

When the trestles are finished work will proceed on



Looking south from Hamlin Avenue, Evanston, the regular surface platforms soon to be superseded can be seen. The pile driver is in position for driving the first trestle

the permanent construction, which includes the placing of concrete walls, building bridges over street crossings, filling in the permanent embankment, erecting new stations and laying tracks.

The work of driving the trestle is being done in sections to give a better balance to the track and trestle work. Temporary tracks carry the traffic on the sections where the construction work is in progress and temporary island platforms are used for loading. Three of these were built between the two trestles, at Foster, Noyes and Central Streets, the present station locations. These platforms, constructed simultaneously with the north-bound trestle, are of sufficient length to accommodate eight-car trains. For surface operation, new temporary platforms for south-bound traffic have been constructed at Foster and Noyes Streets and existing station buildings moved to them. At Central Street station, the platforms and tracks were shifted west to make room for driving the first trestle. In the accompanying illustrations are shown the various steps in constructing the platforms and trestles.

The track layout has provided at all times for two operating tracks and one construction track. These, supplemented by crossovers where needed, have made it possible to conduct the regular transportation business and the construction work on the same right-of-way without the slightest delay to either. North-bound trains were switched to the old south-bound track, while

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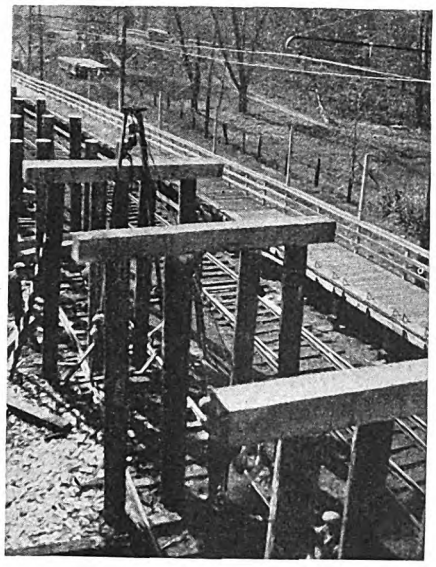
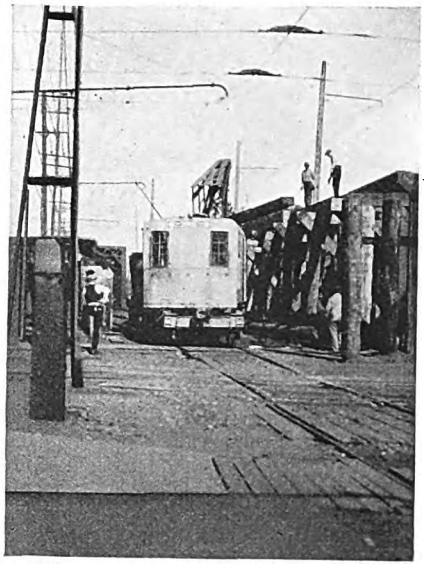
The south-bound trestle is going up rapidly, the pile driver shown in the background being kept busy from dawn to dusk



Portable block and tackle used to hoist the cross sills or caps in place atop the piles



A gasoline-driven traveling crane unloads the heavy stringers directly from the flat-car to their ultimate location on top of the caps

south-bound traffic was switched to a temporary track on the west side of the right-of-way through the section where construction work was progressing.

The two trestles are being constructed on a minimum of 17 ft. centers to allow clearance for a center line of poles supporting the overhead. At stations these centers are increased to permit room for the island platforms. Maximum curvature on the trestles is 6 deg., equivalent to a No. 10 turnout.

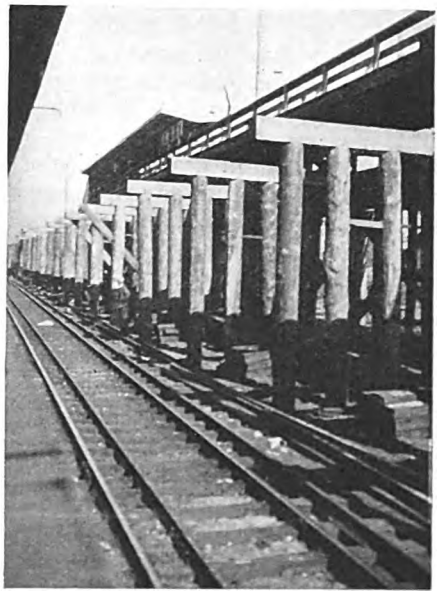
Temporary Track Reduced to a Minimum

Owing to the track and station conditions in Evanston, the north-bound trestle has been located on the east side of the right-of-way, 8 ft. from the east right-of-way line. The second trestle is being driven from the surface track used for north-bound traffic under the temporary operating scheme. South-bound trains operate on the surface over a track formed by utilizing an existing freight spur from University Place to Hamlin Avenue, the Edinger coal track between Noyes and Colfax Streets, and a new piece of temporary track laid between Hamlin and Simpson Streets. These arrangements have served to reduce temporary track construction to a minimum.

In carrying out the work outlined, certain changes had to be made in the operation of the North Shore trains into Evanston. The use of the tracks in the terminal at Church Street has been discontinued. Passenger operation consists only of half hourly service in and out for three hours each morning and evening; consequently it has been possible to make use of a temporary loading platform built along the east yard track, west of the main line which extends north from Church Street. Freight business is being handled at the Chicago, Milwaukee, St. Paul & Pacific freight house at Church Street. At Foster and Noyes Streets the North Shore passengers are using the Rapid Transit platforms.

The north-bound trestle to the right has been completed; the south-bound trestle is just being started

Temporary platform at Central Street station erected to permit unloading passengers from new north-bound trestle



Central Street elevated structure where north-bound traffic is now being handled

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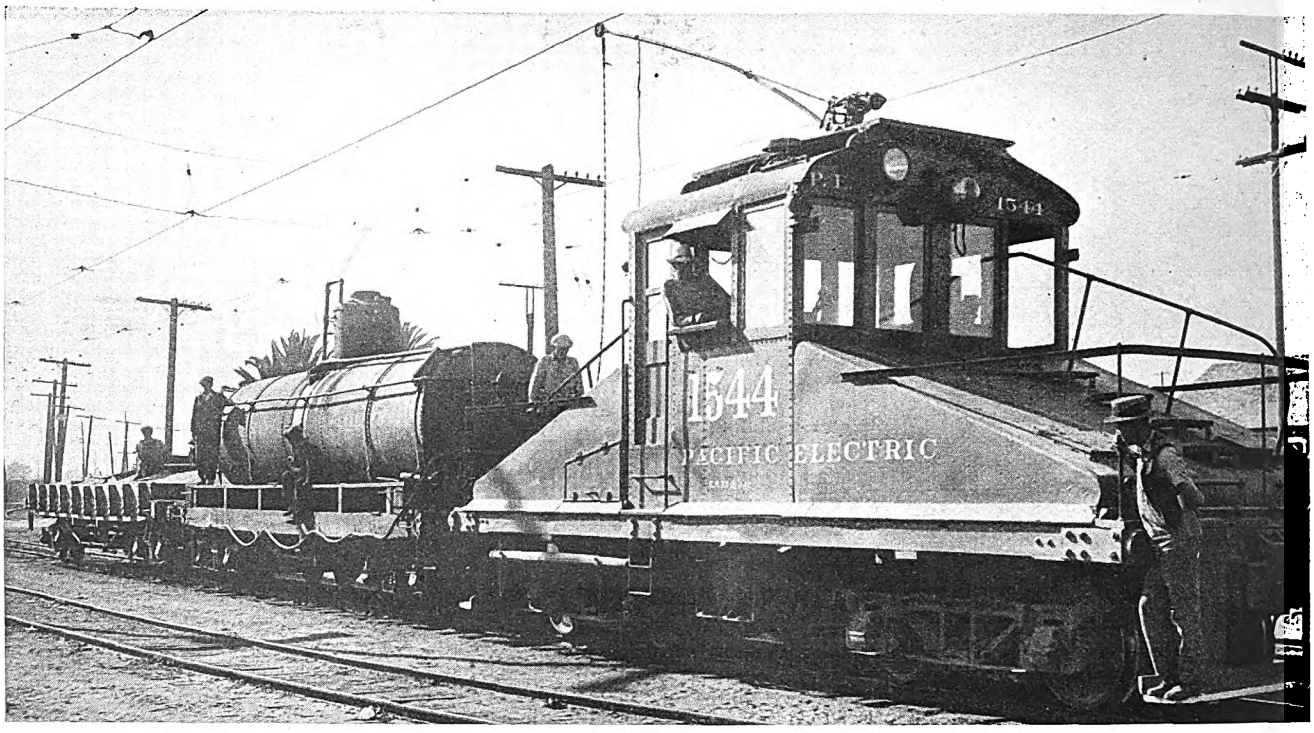


This locomotive, oil tank car, sanding car and crew are used by the Pacific Electric Railway in oiling roadbeds

Weed Fighting in California

Extended trials with hand elimination, burning and chemical treatment have led to spraying by crude oil. This is the method now standard

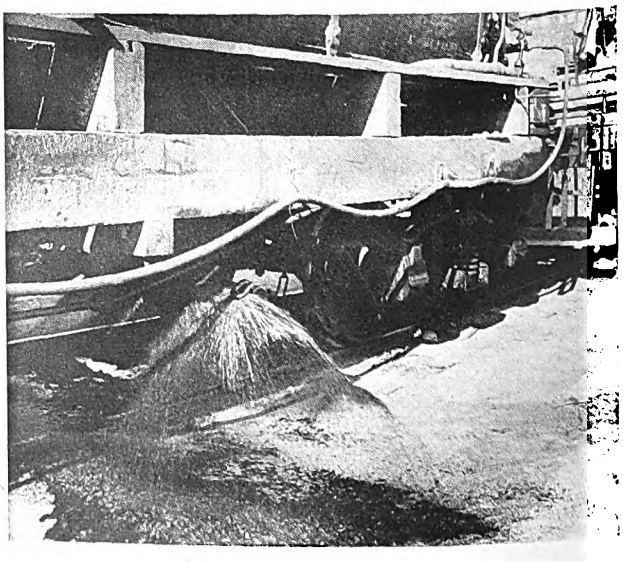
SINCE rails were first laid, the weed nuisance has been more or less of a problem to maintenance-of-way forces of all railways operating over private right-of way. In Southern California, the problem has been especially serious, because of the readiness with which all plants grow. The Pacific Electric has run the gauntlet of experiences in fighting weeds on its rights-of-way.

Not so many years ago large crews of men cleared the rights-of-way by hand. This process was an expensive one, and the burning method of elimination, which came into popular favor some years ago, was tried out. While this process was satisfactory, inasmuch as it dealt a death blow to the growth, it created a fire hazard that was objectionable.

Another plan of dealing with the weeds, is the use of chemicals. This method provides for spraying rights-of-way with some chemical like sodium arsenite, diluted with water, according to the hardiness and thickness of the vegetation to be destroyed. This process has proved far more effective than any other tried up to the time of its introduction, and it still remains the most economical weed destroyer where the problem is solely a matter of destroying vegetation. However, there are other angles to the problem which suggested the wisdom of using crude oil as a weed executor. The theory underlying this plan and found to work out in actual practice is that the oiling process serves four purposes all of which are useful. They are (1) it kills weeds; (2) it settles dust; (3) it improves the appearance of the rights-of-way and (4) it removes the glare from a rock ballasted and other ray throwing roadbed.

The method of applying the oil to the roadbed was developed by the engineering department of the Pacific Electric. It is similar to that used in the application of the chemical weed killer. A regulation tank car is converted into an "oiling car" through the addition of a slotted pipe spray connected to the outlet of the tank. This slotted pipe extends from its connection with the bottom tank outlet to either side of the roadbed proper, and is so constructed that extensions may be brought into use for the spraying of extra wide strips of rights-of-way.

The spraying car is also equipped with a 2-in. centrifugal pump connected to a 5-hp. d.c. motor with a hose connection to the tank proper. There are also two lengths of 1-in. hose about 25 ft. in length with a nozzle on each hose through which the pump forces oil. The nozzles atomize the flow so that it is a simple matter for a man to hold the hose and spread the oil evenly. This latter equipment is called into use only when extra wide strips of rights-of-way are to be sprayed, or where obstructions in the form of posts, poles or fences make it dif-



A "close-up" of the Diesel oil spray

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ficult to use the regular extensions to the roadbed spray.

Immediately following the oil car is a sander, which is a converted flat car, being boxed with sides 18 in. high. There are four spouts, over which is placed a fine screen, into which men placed on the car shovel sand. In this way the greasing effect on the surface of the rail caused by the oiler is neutralized, and the track is left in safe operating condition.

When spraying with regular equipment under average conditions the oiler moves at a speed of 8 to 10 m.p.h., spreading approximately 2,000 gal. of oil per mile. When the hose sprays are used the speed of the train is of necessity slower, depending on the area to be sprayed and the many other local conditions encountered.

The oil used for this purpose, commonly known as Diesel oil, is a low grade distillate with the asphaltum removed, being of 24 deg. gravity.

The oil penetrates the ground very rapidly, to a depth of between 1½ and 2 in. within the first hour, and does not leave a gummy or sticky surface as might be surmised. The cost per barrel of Diesel oil at this writing varies between $1.08 and $1.10, f.o.b. the refinery.

Cost Per Mile Reasonable

The cost of applying the average coat of oil is $40 per single-track mile. This figure includes the cost of the oil, and all operating expenses of equipment, labor and supervision. Where it is necessary to spray by hand, sections of the right-of-way too far distant from the regular equipment, the cost naturally runs higher, being estimated at about 0.2 of a cent per square foot.

Experience on the Pacific Electric Railway shows that best results are obtained through the periodical spraying of the roadbed. The oil is applied at intervals of six months until three coats have been applied. After that it is only necessary to repeat the process about once every two years, and then only with a light single coat. It is simply a matter of getting the ground "set for the killing" and then keeping it that way through occasional spraying.

After the three applications of oil, practically all seeds within the soil of the right-of-way have been killed and thereafter seeds that reach the right-of-way, because they do reach the interior of the soil, do not germinate, but lie dormant until they die. The oil application is effective against all species of weed growths. Particularly has it been "dynamite" against Bermuda grass, more commonly known as the hated "devil grass."

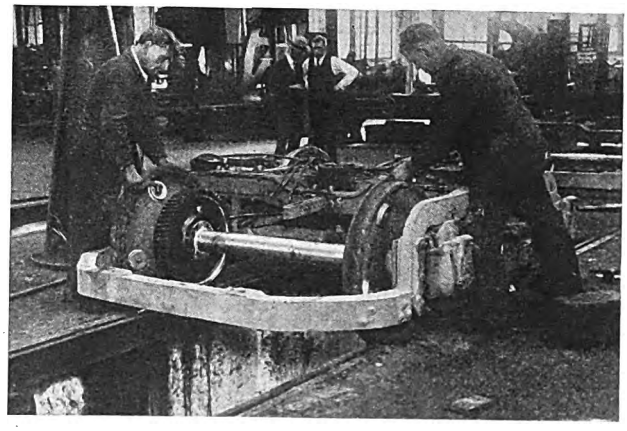
During the past summer season, extensive spraying operations were carried on. To date, 123.55 miles of single track roadbed and 1,153,000 sq.ft. of right-of-way have been treated with oil. The work is still in progress and will continue until the rainy season.

The Pacific Electric Railway has oil treated its San Bernardino, Long Beach and San Pedro lines, all major arteries, besides various strips on practically every line of the system. Oil also has been effectively used in the improving of private rights-of-way in the largely populated cities of Glendale, Long Beach and Culver City.

From any angle viewed, so far as the Pacific Electric is concerned, the oiling process is superior to previous methods. Ultimate cost will show a "smiling" credit on the ledger. Dust is pleasingly and permanently controlled. Roadbed is improved in appearance to the point where complaints have been entirely eliminated, and the glare strain on motormen's eyes is removed through the darkening effect of the oil application. The fourfold purpose which the oil serves, as compared with single benefits of the chemical process, places the oiling method in a class by itself so far as the treatment of the railway roadbed and right-of-way are concerned.

Public Service Installs Noise Reduction Devices

ENGINEERS of the Public Service Co-ordinated Transport, Newark, N. J., have been experimenting for some time with various devices by which it is hoped to reduce materially the noise of street car operation. To damp the noise-producing vibration of the wheel, four holes have been bored through the web. Circular wooden blocks slightly larger than the hole are placed on both sides of the web and bolted together. Grooves have been cut around the gears and pinions and filled with lead to eliminate the grinding ring of the gears. Canvas strips have been placed between moving metal parts to reduce the scraping noises of metal in contact.



Installing wooden disks to reduce wheel noises on cars of Public Service Co-ordinated Transport

These devices have been installed on one car now in service on the Mount Prospect line in Newark. Preliminary tests indicate that the noise of operation has been reduced about 50 per cent. Other cars are being similarly equipped as they pass through the shops for their regular periodic overhauling. If further tests prove as successful as it is expected, all of the company's cars will be equipped with the new devices.

New Englanders Consider New Cars

MORE than 300 members and guests attended the December meeting of the New England Street Railway Club, held at the Hotel Statler in Boston on Dec. 13. The program, arranged by R. B. Stearns, vice-president and general manager of the Eastern Massachusetts Street Railway, included an exhibition of two Birney cars, one a single-truck and the other a double-truck, in the morning, two addresses in the afternoon and a musical entertainment in the evening. The two speakers, Ross Schram of the Twin Coach Corporation, and C. O. Birney of Stone & Webster, Inc., described in detail the new automotive street cars manufactured by the Twin Coach Corporation and the St. Louis Car Company, respectively. W. E. Wood, president of the Virginia Electric & Power Company, gave a talk on the Coffin Award for 1928.

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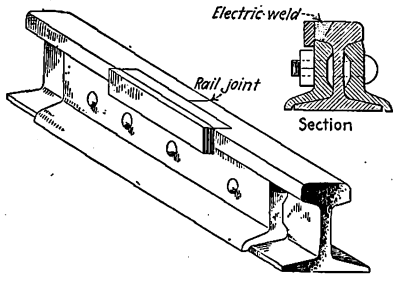
Time and Labor Saving Ideas

Inexpensive Welded Rail Joint*

By Louis T. Botto
Superintendent Maintenance-of-Way Department, San Antonio Public Service Company, San Antonio, Tex.

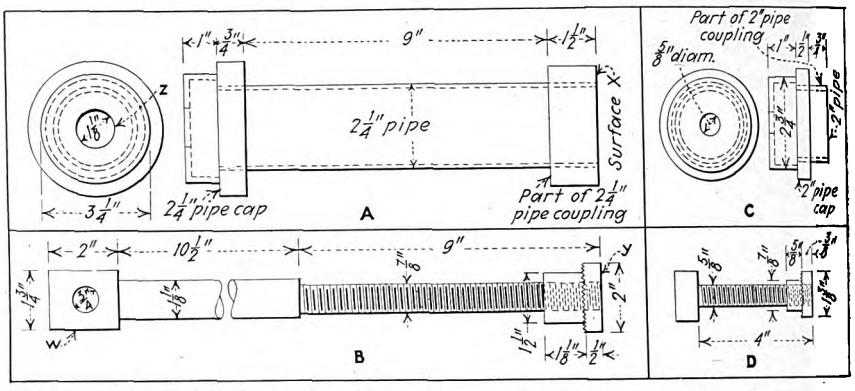
ON LINES of the San Antonio Public Service Company, San Antonio, Tex., in gravel ballast track that is not welded throughout, many bad joints have been reconditioned by a very inexpensive method of welding. The accompanying sketch shows the construction used. A part of the rail head at the joint is cut out on a bevel. A piece of boiler plate is then applied to the outside of the rail, and the space left by the portion that is cut out is filled in by welding. This forms a permanent joint between the angle bar, the rail and the plate. It has been found that this weld does not pull apart in service, and makes a very smooth joint.



Details of welded rail joint used by the San Antonio Public Service Company

Simple Air Compressor Bearing Press

TROUBLE was experienced by the Richmond Railways, Inc., Staten Island, N. Y., in removing armature and pinion bearings of the Westinghouse DH-16 air compressors from their housings until Air Equipment Inspector E. Niksic designed a hand press to perform this work. Prior to the adoption of this tool it took a long time to remove the bearings from the housings, and often the bearings were unfit for further service after their removal. The tool referred to is shown in the accompanying sketches. Illustrations *A* and *B* show the parts of the press used for the removal of the main armature bearings; the other two show the parts of the press used for removing the pinion bearings. Both are similar so that a description of the design and use of one will suffice.



These tools provide means for effecting a very substantial reduction in air compressor maintenance expense. Above, press for removing main armature bearing. Below, press for removing pinion bearing

Referring to the main armature bearing press, this consists of two parts, *A* and *B*. Part *A* is made of a piece of 2¼-in. iron pipe 11¼ in. long. One end is fitted with a 2¼-in. pipe coupling 1½ in. long, and the other with a 2¼-in. pipe cap. The assembled parts are 12¼ in. long. The center of the pipe cap is drilled with a 1⅛-in. hole.

Part *B* is a round rod 19½ in. long fitted with a head 1¾x2x1¾ in. and drilled with a ¾-in. diameter hole. The rod is turned to 1⅛ in. diameter for a distance of 10½ in. from the bottom of the head. The remaining 9 in. is turned to ⅞ in. and threaded with a standard ⅞-in. thread. The end of this threaded portion is fitted with a 1½ in. diameter collar with a 2 in. diameter by ½ in. thick flange. The inner face of this flange has saw teeth to assure that it will grip the bearing during removal.

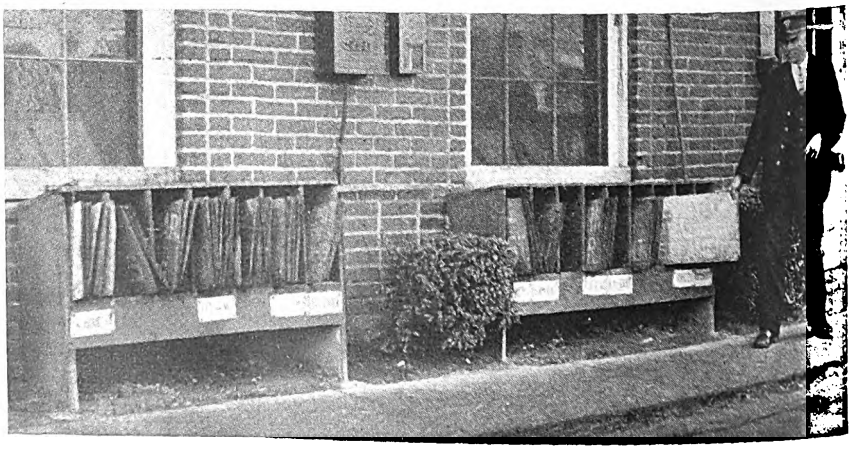
This tool is used as follows: Collar *Y* is removed and the rod *B* inserted into cylinder *A* through the hole *Z*. Then the rod *B* is passed through the bearing and the surface *X* placed against the bearing housing. Collar *Y* is then screwed onto the rod *B* until the saw teeth press against the end of the bearing. A lever rod is then placed in hole *W* and the screw is turned. The saw teeth in the collar grip the bearing tightly and prevent it from turning. Continued tightening of the screw gradually pulls the bearing from its housing and deposits it in the cylinder *A*.

Sign Rack Saves Time of Car Crews*

By C. B. Hall
Chief Clerk Mechanical Department Virginia Electric & Power Company, Norfolk, Va.

A DASH SIGN rack erected in the car yard of the Virginia Electric & Power Company, Norfolk, Va., has proved a great time saver to car crews. The rack is of simple construction with partitions to separate the different dash signs carried by the

**Submitted in* Electric Railway Journal *Prize Contest.*



Dash sign rack at the dispatcher's office of the Virginia Electric & Power Company

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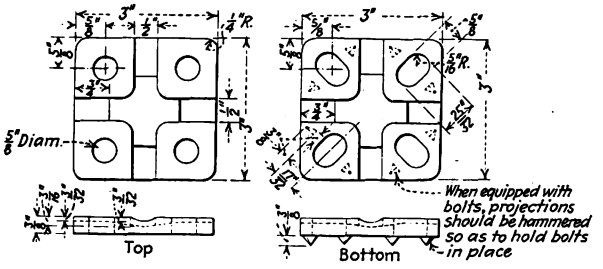
cars. It is installed in the direct path of the operators when leaving the dispatcher's office for their respective cars. All that is necessary is to draw out the particular sign desired. Carhouse mechanics remove the signs from the cars at the close of the day's run, and return them to the proper sections in the rack.

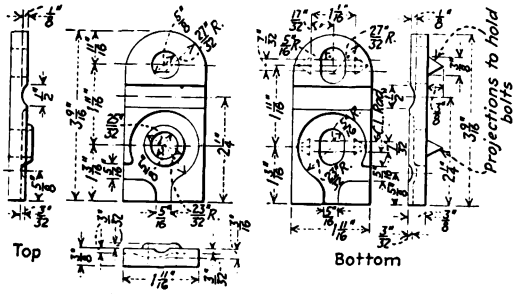
Overhead Line Devices That Save Labor and Reduce Maintenance

ACCOMPANYING illustrations show seven types of overhead devices utilized by George Butterick, supervisor of lines for the Connecticut Company, New Haven, Conn., and which have proved of particular benefit in that company's line construction. The devices include three types of supporting brackets, two clamps and two types of switches.



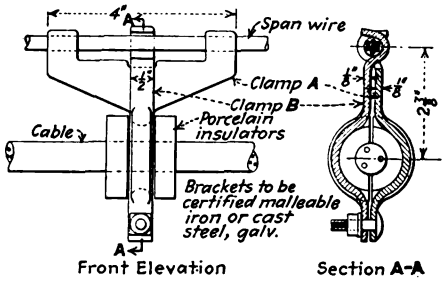
Four Bolt Span and Backbone Clamp

This is used where a backbone is installed on the front side of the pole. It has resulted in a considerable saving both in labor and material for trolley curve work.



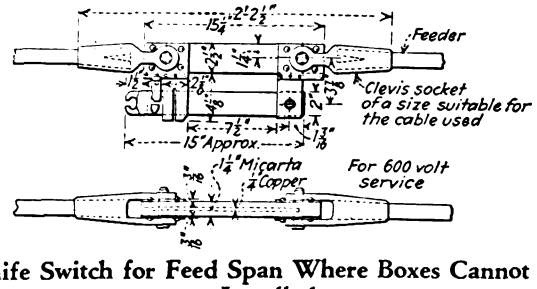
Standard Clamp for Pull-Offs on Backbones

Used on curves, this does away with the necessity of a pull-off on backbone, thus saving thimble and serving of pull-off wires.



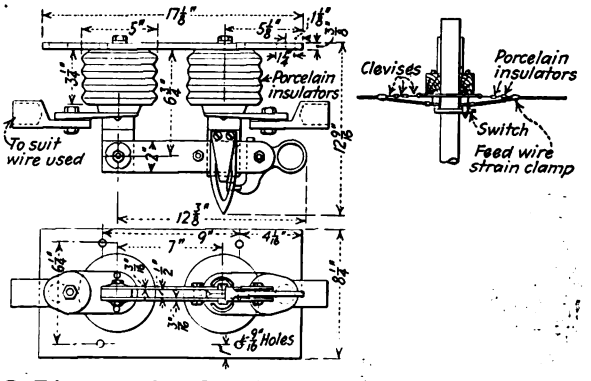
No. 4 Signal and Electric Track Switch Cable Bracket

A convenient device for suspending signal and electric track switch cables on span wires or messenger wires in connection with automatic signals and electric track switches. It can be used also for suspending cables for traffic signals, street lights, etc.



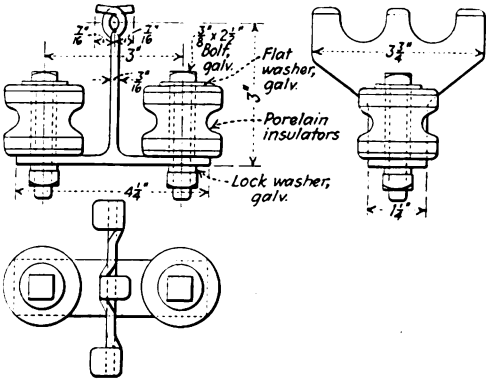
Knife Switch for Feed Span Where Boxes Cannot Be Installed

This is used in feed spans for trolley service where city or municipal authorities prohibit the use of switch boxes on poles.



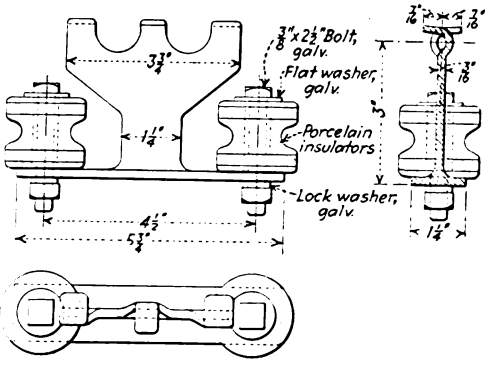
D.C. Disconnecting Switch To Be Used Under Crossarm Where Switch Box Cannot Be Used

Where city or municipal authorities prohibit the use of a box on the poles, the type of direct-current disconnecting switch shown is used under crossarm.



Assembly of No. 2 Straight Way Type Signal Wire Bracket

For carrying signal contactor wires under the span from the signal contactor to the automatic signal, the assembly No. 2 straight way type signal bracket shown is found of particular convenience.



Assembly of No. 3 Cross-Way Type Signal Wire Bracket

This is used on spans to carry either two signal wires or two telephone wires between turnouts where the same cannot be carried on crossarms due to tree interference, or they may be used between turnouts instead of installing on crossarms.

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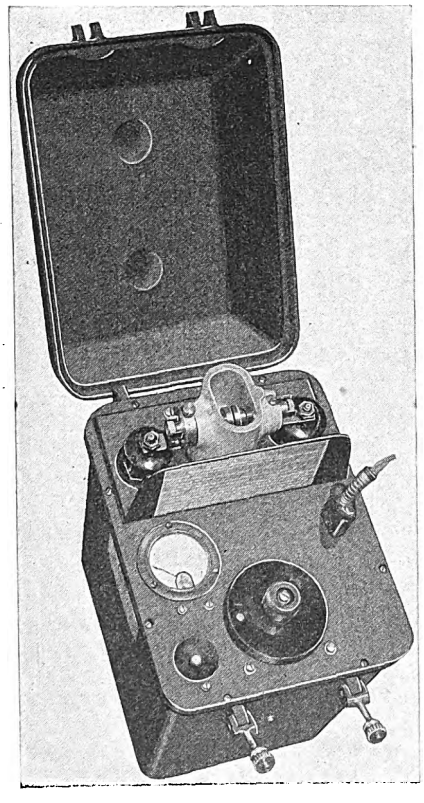
New Offerings of
Useful Equipment

Portable Oil Testing Set

FOR determining the dielectric strength of insulating oils, a new ½-kva. portable oil testing set has been brought out by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. It is mounted



New portable oil testing set

in a cast aluminum case and includes besides the transformer a double pole self-restoring push switch, control rheostat, portable plug for connecting to an ordinary 110-volt light socket, voltmeter calibrated in kilovolts, an oil test cup fitted with standard testing electrodes and a feeler gage for setting. All these are mounted on a panel at the top and inside of the case.

When making a test, the gap between the electrodes is set with the feeler gage and the cup is filled with the sample of oil to be tested. The rheostat control arm is moved forward, so as to give a gradual increase in voltage until the oil in the test cup flashes over. The rheostat control handle returns to the starting position automatically when released. The voltmeter reads the equivalent of the test voltage and the value of the oil failure is thereby observed.

Tests have shown that as little as 0.005 per cent of moisture will reduce the dielectric strength of oil to about one-half its dry strength. The N.E.L.A. recommends that oil samples from all substation apparatus and power station equipment be tested at least once every three months and that samples for distribution transformers be tested at least once a year.

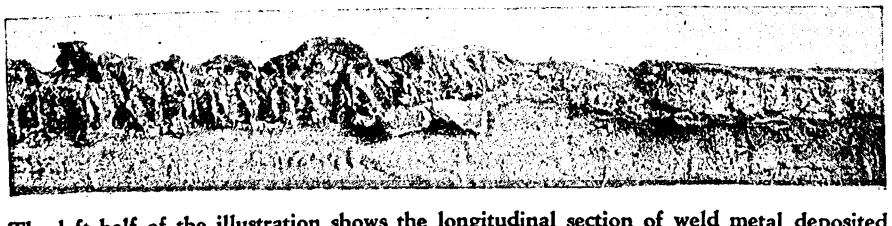
Welding Rod Increases Speed of Welding

FOR producing a dense weld of great ductility at increased welding speeds, the Lincoln Electric Company, Cleveland, Ohio, has developed a welding electrode known as "Fleet-Weld." The speed of welding has been doubled or trebled by use of the new rod and welding costs have been lowered.

The wide use of high-speed electrodes has been retarded in the past, due to the porosity obtained when the higher currents necessary for fast welding are used. The newly developed rod has overcome this difficulty. In the illustration a comparison is made of the porosity of beads laid down with the common type of wire and with the new electrode.

An incidental advantage which the new electrode offers is the smooth finish of its bead. This in part is caused by the higher speed of travel allowed by the new electrode, and also in part by the composition of the rod.

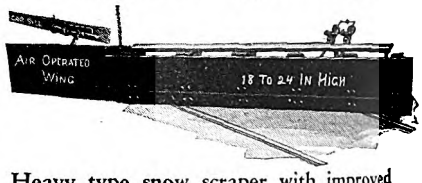
Greater ductility of the bead and deeper penetration are two of the requisites of better welding which the newly developed high-speed wire also offers. The electrode itself is an extruded wire that permits high-speed welding without loss of denseness and ductility to the weld metal. While "Fleet-Weld" electrode has so far been a laboratory product, it is expected to be commercially manufactured and placed on the market in the near future.



The left half of the illustration shows the longitudinal section of weld metal deposited from ordinary wire at higher currents and speed, while at right the deposit is from the newly developed "Fleet-Weld" electrode

Improved Scraper With Air Wing

FOR removing drifts and heavy falls of snow, a scraper with a wide blade and a side wing, operated by air, has been announced by the Root Spring Scraper Company, Kalamazoo, Mich. The springs are made of $\frac{5}{16}$-in. spring steel instead of ¼ in. used with previous types. They are



Heavy type snow scraper with improved air-operated side wing

bolted to a pipe shaft which rotates in hanger castings. These castings are made of malleable iron and are bolted securely to the hanger board. The hanger board is made of channel steel. The springs have a mould board and attachment to the scraper edge which comes in contact with the pavement. It is reversible, permitting wear on both sides.

Springs are constructed so as to hold the scraper blade to the pavement. In the event of catching any obstruction the springs are forced back, which allows the blade to pass over without injury to the car or to the scraper. The mould board is from 18 to 24 in. high, and is made from 9 to 12 ft. in length. The blade is raised by air cylinders and is also lowered and held in operating position by air.

The air-operated side wing can be attached to the truck or side sill of a car. It is 24 in. high and 6 ft. long. The wing moves the snow from the side of the track, where it is delivered by the scraper, and rolls it 6 ft. away from the car. It can be folded quickly with the car moving to pass automobiles parked along the curb, and can be extended again just as quickly.

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News *of the* Industry

Committee on Movement of the Vehicle Considers Congestion

Meeting at the Hollenden Hotel, Cleveland, Ohio, on Dec. 17, the committee on The Movement of the Vehicle, of the Transportation & Traffic Association, proceeded to organize and discuss in a general way the subjects to be studied during the coming year. In recognition of the fact that speed is the prime requisite of good electric railway service, discussion resolved itself around the best ways and means of attaining this end. The prevalent traffic congestion in all of the larger cities of the country came in for its share of comment, as did the question of the parking of autos both in the business sections and outlying districts of cities. It was the consensus of opinion that the halting of cross-traffic at high speed thoroughfares, on which street car service was given, would result both in faster street railway service and fewer accidents.

For future study the work of the committee was divided between four subcommittees to which subjects were assigned as follows:

Committee No. 1, C. H. Evenson, chairman—parking regulations; merchants' survey of store traffic; general traffic survey; store-door deliveries.

Committee No. 2, E. D. Merrill, chairman—signals, traffic control and boulevard stops.

Committee No. 3, Joe Ong, chairman—car and coach stops, platforms and safety zones.

Committee No. 4, R. H. Pinkley, chairman—equipment for handling passengers as related to vehicular movement.

The next meeting of the committee is scheduled for March 1, 1929, in Chicago.

Among those who attended the meeting were D. L. Fennell, chairman; C. W. Wilson, vice-chairman; Paul S. Wilson, sponsor; O. A. Broten, C. H. Chapman, M. W. Cooke, E. R. Fitch, Donald Goodrich, C. H. Evenson, H. H. Hill, E. D. Merrill, J. Metcalf, William H. Lines, Joe R. Ong, R. H. Pinkley, J. C. Thirlwall, W. E. Thompson, and J. W. Welsh, general secretary American Electric Railway Association.

Exchanging Tickets in Gary

A joint tariff has been filed by the Gary Railways and the Gary & Southern Traction Company of Gary, Ind., with the Public Service Commission of Indiana asking the privilege of exchanging commutation tickets on the lines of the two systems. The Gary & Southern line, recently purchased by the Midland Utilities Company, Chicago, is being operated under the direction of the Gary Railways, which also is a subsidiary of the Midland Utilities Company. Under the proposed tariff the Gary & Southern will sell its 50-ride monthly commutation ticket form, with transfer privileges to the Gary City lines of the Gary Railways, giving passengers from Crown Point on the Gary & Southern the opportunity to use a free transfer to any first connecting zone on the Gary Railways. The charge for monthly commutation books with the free transfer privilege will be $1.50 over the present rate of $11.25.

Changes in the names of all stations between Gary and Crown Point on the Gary & Southern Traction line have also been announced by operating officials. The changes were made to identify the name of each station closely with its territory. Formerly, each station was known as a numbered stop.

Franchise Negotiations in Rochester

Active work on preparing new grant to extend present service-at-cost contract to be begun after first of year. Amendments likely

CITY officials of Rochester, N. Y., are gathering data with a view to renewal of the ten-year service-at-cost contract under which the Rochester lines of the New York State Railways are operated. The present contract remains in effect until Aug. 1, 1930, but written notice of renewal must be filed by the Mayor before Aug. 1, 1929.

It appears likely the agreement will be renewed, but it is considered equally certain that it will be amended in several particulars. For one thing, provision must be made in the new contract for operation of the new $12,000,000 city-owned subway in the bed of the abandoned Erie Canal. The railway has been operating the subway lines since Jan. 1, 1928, under an extension of the service-at-cost contract.

The contract, drafted in 1920, attracted wide attention. The city's interests are guarded by a railway commissioner. Charles R. Barnes, a veteran in the street railway industry, has held that position since the inception of the contract system. The contract guarantees the railway a 6 per cent return on its investment. The fare is determined by a balancing account. It is expected that these two features will be retained in the new contract to be made, although the valuation of the lines, which serves as a basis for the whole contract, is sure to be a bone of contention. The city has a suit in the state courts, seeking a lower valuation.

However, the litigation over the valuation of the lines will not be pressed during the life of the present contract, city officials admit. City Manager Stephen B. Story summed up the city position in these words:

> It is always possible that a revaluation may result in setting a higher valuation than now exists. The city wishes to be sure of its ground before proceeding.

City officials also are awaiting a verdict in a valuation case now in United States Supreme Court which is regarded as having a direct bearing on the Rochester situation.

Speaking for the New York State Railways, James F. Hamilton, president, has said that the railway believes a higher valuation is justified, but in the interests of harmony, is willing to let the figure stand as is.

It is expected that actual negotiations for a renewal of the service-at-cost contract will start shortly after the first of the year. City officials studying the situation include, besides City Manager Story, Commissioner Barnes and Mayor J. C. Wilson, members of the staff of the Bureau of Municipal Research.

The Holiday Spirit

NOW comes the yearly Christmas rush
With almost ev'ry trip a crush;
In ev'ry load are anxious mothers
With babes in arms, kid sisters, brothers,
All on their way to view the toys
St. Nick's prepared for girls and boys.
They'll walk about for miles and miles
Their happy faces wreathed in smiles.
But when the shopping day is o'er
They may be tired and cross and sore,
Their tempers may be sadly tried
When ready for the homeward ride,
So that's the time for us to be
Considerate; our sympathy
And any help we give will tend
To make each passenger a friend.
It's up to us to do our share
By courtesy, good temper, care—
By ev'ry kindly act in reason
To *live* the Spirit of the Season.

—JOHN E. WILKIE,
Vice-President, in Chicago Surface Lines Service Magazine.

To Resume Utility Hearings

Unless court engagements interfere, the Federal Trade Commission is expected to resume public hearings in the publicity phase of its power and gas utilities investigation early in January, according to an interim report of the commission transmitted to the Senate. Between fifteen and twenty accountants are now working in the offices of a

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number of the largest holding companies, each of which controls companies in many states. They are securing data supplementary to the information called for, in the general report form sent out by the commission to utility companies.

New Brief for New York City in Fare Case

Through its counsel, Charles L. Craig, Joseph A. Devery, and Edgar J. Kohler, the city of New York has filed a "brief" with the Supreme Court of the United States in the case of the Transit Commission, etc., and the city of New York vs. Interborough Rapid Transit Company and Manhattan Railway. The brief covers 186 pages, which is considerably less than the number in its previous brief. This latter was criticized by the Supreme Court because it was too lengthy.

Contracts Not a Subject of Regulation

The new brief shows that the city makes nine points in its argument. They are as follows:

1. The contracts between the city of New York and the Interborough Rapid Transit Company are not a subject of regulation. The city of New York does not require a railroad corporation for the operation of its rapid transit railroads; an individual would do as well, and the terms which the city makes with an operator of its rapid transit system are not subject to regulation under the Public Service Commission law.

2. The power of regulaiton is never exercised except in the public's interest. It is not in the public's interest to frustrate the city's plan and policy for the distribution of its population by a low flat fare. The powers and duties of the municipal government cannot be transversed to or invested in or subordinated to the Transit Commission, a body of State officers, in disregard of the local government provisions of the State Constitution.

3. If the assumption is made that the lessee of the subway is a public service corporation, as distinguished from a private corporation, valid contracts existing between it and the city of New York fix the fare at 5 cents during the term of the lease. This contract was made under full and express legislative authority. The validity thereof and the constitutionality of such legislation have been adjudicated and sustained by the Court of Appeals of the State of New York. Where there is a contract there is no confiscation.

4. The Rapid Transit Act, pursuant to which such contracts and elevated railroad certificates were made, is a comprehensive special section, excluding any possible subordination to the public service commission law.

5. The Legislature has not at any time empowered the Public Service Commission to regulate the rates of fare agreed upon in contracts made by the city of New York pursuant to the Rapid Transit Act.

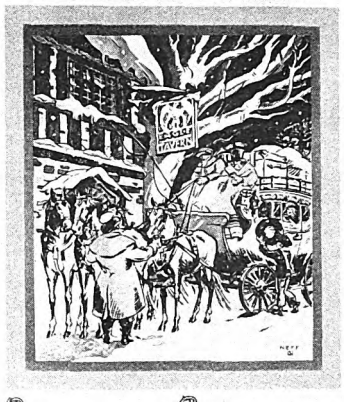
6. The decisions of the State Court in gas and street surface railway cases do not sustain the conclusion of the court below, but are contrary thereto. In particular, the decision in the so-called Garrison cases on reargument are fatal to the claims of the Interborough Company, based on the Nixon case. The city claims that the three so-called Garrison cases, 229 N. Y. 575, exclude from the control of the Public Service Commission over fares, franchises granted by municipal authority subsequent to the passage of the Public Service Commission law on July 1, 1907. The so-called Nixon case, People ex rel., City of New York v Nixon, 229 N. Y., 356, decided July 7, 1920, upheld the right of the commission to make changes in franchise conditions in certain cases.

7. There is no confiscation of public property from the present fare, in spite of the claim of the company that it is entitled to earn an 8 per cent return on all of the property owned by the city of New York, as well as on its own investment used for rapid transit purposes. The city also claims that there is no confiscation of private property through a maintenance of the present fare.

8. The elevated railroad certificates, by which permission was granted to the Manhattan Railway to build additional tracks and extensions, are affected by the same statutory authority and contract obligations as are the subway contracts.

9. There is no federal question in the case. The court below, whose decision was in favor of the Interborough Company, was imposed upon.

In conclusion, the city counsel ask that the order appealed should be reversed and that the application be denied with costs.



A Railway's Attractive Message

New Board in Boston

Governor Alvan T. Fuller of Massachusetts has appointed a new board of trustees for the Boston Elevated Railway, Boston, Mass., under the public control act of the Legislature. Henry I. Harriman, president of the Boston Chamber of Commerce and chairman of the Metropolitan Planning Board, is appointed together with General Charles H. Cole, who was the Democratic nominee for Governor this year, and George B. Johnson, president and director of R. H. White Company, one of the largest department stores in Boston, recently consolidated with William Filene's Sons Company.

In addition to these three men, who will be new members of the board, the Governor reappointed Stanley R. Miller and Edward E. Whiting. The men who were dropped from the board are former Congressman Samuel L. Powers and Frank O'Hare.

Under the law the board of trustees will elect its own chairman, and it is expected that it will elect Mr. Harriman, who is one of the best informed men in the state on the subject of transportation facilities for the Metropolitan district. In accepting the appointment Mr. Harriman asked that he be relieved of his post with the Metropolitan Planning Board, and Colonel Charles R. Gow was appointed by the Governor to succeed him on that Board.

Injunction in Baltimore

The first formal step to get the fare case of the United Railways & Electric Company, Baltimore, Md., before the United States Supreme Court has been taken by the company in the filing of a petition in the Circuit Court of Baltimore. An injunction is sought to restrain the Maryland Public Service Commission from interfering should the company charge a straight 10-cent fare. Company officials explained that the petition does not mean that the United will attempt to put the 10-cent fare into effect, but is an effort to get the legal records in such shape that the case can be taken to the highest court.

Recently, the Public Service Commission, acting on a decision of the Maryland Court of Appeals, reconsidered the depreciation issue of the fare case and authorized the company to charge a 10-cent cash fare with four tokens for 35 cents. At that time the case had been appealed to the Supreme Court, but that tribunal would not consider it because it had been remanded to the Public Service Commission, and the petition was dismissed.

When the original case was taken into the Maryland Courts it was held by Judge Ulman in the Circuit Court that it was confiscatory to limit the company to an earning of only 6.26 per cent. The Court of Appeals, however, held that this was not confiscatory, but remanded the case on the depreciation issue. It was then that the Supreme Court dismissed the petition.

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Another Committee on Congestion in New York

Sixty civic and business organizations have been called in consultation to consider the question of traffic congestion in New York.

A remedy is promised for next summer by a committee of 45, called the New York Citizens' Traffic Committee, organized at a meeting sponsored by the Board of Trade.

Two general plans are under consideration. The committee may urge construction of new traffic facilities, or it may devise methods for more efficient use of the streets.

W. J. L. Banham, president of the Board of Trade, suggested that the committee confine itself to the better use of existing facilities. He pointed out that Day & Zimmerman, engineers engaged by Mayor Walker, are to report in February on the cost of multiple-decked traffic thoroughfares, a tri-borough bridge, a traffic tunnel from Manhattan to Brooklyn, and a traffic tunnel running the length of Manhattan.

Philip Le Boutillier, president of the Retail Dry Goods Association, urged immediate action.

"One of the chief causes of the present situation has been the deferring of action on projects that should have been carried out long ago," he said.

Percy S. Straus, vice-president of R. H. Macy & Company, was appointed to confer with merchants and manufacturers, suggesting that they do their heavy hauling at night.

The parking problem will also be studied. The Fifth Avenue Association is opposed to absolute prohibition of parking, on the ground that it would hurt trade.

Members of the committee, which is to be enlarged later, are as follows:

Dr. John A. Harriss, former deputy police commissioner.
Logan Billingsley, president Bronx Chamber of Commerce.
Gilbert Hodges, president New York Advertising Club.
W. F. H. Koelsch, president 34th Street Midtown Association.
Col. Michael Friedsam, president Fifth Avenue Association.
Arthur H. Woods, president Automobile Association of America.
George W. Sweeney, president 42nd Street Property Owners Association.
George Daniels, president the Merchants Truckmen's Bureau.
John C. Forster, president Eighth Avenue Association.
Lee J. Eastman, president Broadway Association.
Congreve Jackson, president First Avenue Association.
Judge Alfred E. Ommen, West End Association.
Philip Le Boutillier, president Retail Dry Goods Association.
William G. Campbell, president Central Park West and Columbus Avenue Association.
William J. Pedrick, vice-president, Fifth Avenue Association.
C. E. Denney, vice-president Erie R.R. Company.
Albert Behning, president Harlem Board of Commerce.
David Robertson, president Downtown League.
Fred Muschenheim, president Hotel Men's Association.
Henry A. Wise Wood, manufacturer.
R. A. Pope, engineer.
W. W. Arnheim, merchant.
George H. Pride.
James P. Roe.
W. G. Curren, Baltimore & Ohio R.R.
Mr. Horowitz, president Thompson Starret Co.
H. G. Bragg, Automobile Merchants Association.
L. F. Loree, president Chamber of Commerce of the State of New York.
Willis H. Booth, president Merchants Association.
Peter Grimm, president Real Estate Board.
Philip D. Hoyt, first deputy police commissioner in charge of traffic.
Charles H. Tuttle, United States Attorney.
Richard E. Enright, representing the Civitan Club.
Robert E. M. Cowie, president American Railway Express Company.
Percy S. Straus, vice-president R. H. Macy & Company.
C. P. Perry, president James McCreery & Company.
J. S. McCulloh, president, New York Telephone Company.
M. S. Sloan, president New York Edison Company.
Frank Hedley, president Interborough Rapid Transit Company.
George McLaughlin, president Brooklyn Chamber of Commerce.
L. C. L. Smith, president Queensboro Chamber of Commerce.
Richard S. Childs, president New York City Club.
Jules S. Bache, banker.
John F. Galvin, chairman Port Authority.
Sol Raives, Theater Owners' Association.

How Railway Men Look as Santa Claus

Neil Funk, of the Louisville Railway, Louisville, Ky., was one of a number of business men cartooned by Paul Plaschke, staff cartoonist of the Louisville *Courier-Journal*, who ran them on a special sheet on Dec. 16, under the heading "How They Would Look As Santa Claus." Neil has been much in the limelight as a leader in Safety Work.

Grand Rapids Speaker Urges Co-ordination

Former Commissioner Edwin F. Sweet of Grand Rapids, Mich., returned to that city from the recent conference of the National Rivers and Harbors Congress at Washington, convinced more than ever of the need of co-ordination of city transport services. This he made plain in an address before the local commission in Grand Rapids. Mr. Sweet reported in Philadelphia the operating utility has pressed taxicabs and buses into service to relieve the situation, and information received from officials of that company was to the effect there was no apparent reason why a similar system could not be worked out in Grand Rapids. He said:

There is in my mind particularly an idea that perhaps such a system, working with only one overhead expense and as one corporation and under the necessary city supervision, could give better results with less expense to the public.

Outlining the increased need for transportation at reasonable cost in the years to come, Mr. Sweet recalled Herbert Hoover's statements several years ago that the population of the United States had doubled in 25 years and the country would need twice as much transportation facilities in the next 25 years.

No official action was taken upon Mr. Sweet's suggestion that a special investigating committee be appointed to gather data on the local transportation situation, but those present appeared to be in sympathy with his idea.

Activities in Cleveland

The City Council of Cleveland, Ohio, recently passed Cleveland Heights' fare franchise, providing for a rate 2 cents higher than Cleveland's fare and for extensions on Mayfield, Fairmount and Cedar Roads. The increase goes into effect as soon as extensions are completed about Jan. 1. East Cleveland already pays the 9-cent fare. Other suburbs are expected to follow.

Cleveland city and county officials have backed the plan to take all street cars off the Public Square and build a subway terminal underground there to relieve surface traffic.

Judges to Hear Decatur Fare Case

Five superior court judges have been appointed by Governor L. G. Hardman, of Georgia, to serve in the places of as many supreme court judges who recently declared themselves disqualified to hear the appeal of the Georgia Power Company from the 5-cent fare decision affecting Decatur. Only one justice of the Supreme Court—Marcus W. Beck—was qualified to sit in the case, all the others having declared that relatives owned stock in the company.

A hearing on the appeal will be held shortly.

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Committee Indorsed in Chicago

The committee on local transportation of the Chicago City Council has indorsed the citizens' traction settlement committee appointed by Federal Judge J. H. Wilkerson. However, the council committee provided in its resolution of indorsement that other citizens or civic clubs should be permitted to participate in the negotiations. The purpose of the citizens' traction settlement committee is to study all interests and make recommendations.

Brooklyn City Operators Win Bonus Awards

Distinguished from their fellows by an accident-free year to their credit, 52 motormen, conductors and safety car operators of the Brooklyn City Railroad were entertained at luncheon Dec. 15, 1928, as the guests of Clinton Morgan, general manager, and, in addition to receiving their regulation bonus of $60, were presented with Hamilton railroad-model watches. Four of the number, who had operated two years without a chargeable accident and had already received watches, were presented satin-lined cases, each containing five $10 gold pieces.

After the luncheon at which the presentations were made, A. L. Hodges, assistant general manager, visited the various carhouses on the system and distributed bonus checks to other trainmen, not quite so fortunate as the 52, but enough so to have won bonuses aggregating $77,300. Of a total of 2,182 car operators on the Brooklyn City system, 2,099, or 96.2 per cent, qualified for the individual bonuses, receiving from $5 to $60 each.

This was the third bonus distribution to the Brooklyn City men, the award having been instituted Aug. 1, 1926. The 1926 bonus award was $20,770, the 1927 bonus was $71,470, and the one distributed Saturday totalled $80,600. During the year ending Nov. 30, 1928, "at fault" accidents on the property were reduced by 28 per cent compared with the preceding twelve months.

Heavy Electric Traction Committee Organizes

The first meeting of the year of the heavy electric traction committee of the American Electric Railway Engineering Association was held in New York on Dec. 14. The principal purpose of the meeting was to organize the work for the ensuing year and appoint the various sub-committees. Those present were: Messrs. Armstrong, Birch, Brown, Blake (representing Mr. Buck), Butt, Barclay (representing Mr. Cooper), Daus, Davidson, Davis, Febrey, Hagan, Healy, Huber, Grady (representing Mr. Smith), Thorp and Winship; Mr. Neff, guest; and Mr. Hecker and Mr. Baker of association headquarters, a portion of the time. The sub-committees will be made up as follows:

A review of existing manual sections: Messrs. Wells, chairman, Bosenbury, Butt, Davis, Duer, Hagan; study of track and third rail bonds for heavy traction work, Messrs. Febrey, chairman, Birch, Butt, Davis, Duer, Hagan, Thorp and Winship; branch line electrification and self-propelled cars and locomotives; Messrs. Armstrong, chairman, Bosenbury, Brown, Butt, Cooper, Davidson, Healy, Winship and Wright; articulated train operation; Messrs. Daus, chairman, Buck, Hamilton, Johnson, Smith and Wood; train make-up and terminal switching with multiple unit cars; Messrs. Wright, chairman, Brown, Butt, Hagan, Hamilton, Smith, Thorp, Vandersluis and Wells; electrified mileage and electric locomotive tonnage, Messrs. Cooper, chairman, Armstrong, Birch, Buck, Davis, Duer, Healy, Winship and Wood; third rail and overhead clearances with special reference to shipments and steam locomotive operation (if this subject is approved by the association), Messrs. Winship, chairman, Bosenbury, Brown, Butt, Davis, Duer, Johnson, Vandersluis, and Wright.

Thursday, Feb. 28, was chosen as the tentative date of the next meeting.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Jan. 4, 1929—**Metropolitan Section, American Electric Railway Association, 33 W. 39th St., New York, N. Y.**

Jan. 14-18—**American Road Builders' Association, convention and road show, Cleveland, Ohio.**

Jan. 15-16—**Kentucky Association of Public Utilities, annual meeting, Brown Hotel, Louisville, Ky.**

Jan. 22—**New York Electric Railway Association, mid-winter meeting and dinner, Hotel Commodore, New York, N. Y.**

Jan. 23-25—**Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.**

Jan. 24-25—**Central Electric Railway Association, Claypool Hotel, Indianapolis, Ind.**

Jan. 25-26—**Central Electric Railway Accountants' Association, Claypool Hotel, Indianapolis, Ind.**

Jan. 28-Feb. 1—**American Institute of Electrical Engineers, annual convention, 33 W. 39th St., New York, N. Y.**

Feb. 7-8—**Midwest Electric Railway Association, Midwinter meeting, Robideaux Hotel, St. Joseph, Mo.**

Feb. 14—**Central Electric Railway Master Mechanics' Association, Youngstown, Ohio.**

Committee on Industrial Relations Plans Activities

At the call of Edward Dana, chairman, the committee on industrial relations of the American Association met in New York City Dec. 17 and 18. The matter of subjects to be considered during the coming year was discussed at considerable length and, with the realization that a wide range of activities must be covered, it was finally decided to perfect the organization of three sub-committees to consider the general subjects of education and training, employment and advancement, and health and safety, with J. S. Hyatt, Clint Smith and W. G. Marshall as the respective chairmen.

Among those who attended the meeting and took part in the discussions were L. P. Baurhenn, F. G. Buffe, H. H. Norris, C. W. Chase, H. H. Fenton, Edward Dana, E. C. Foreman, R. W. Emerson, W. G. Marshall, Thomas Fitzgerald, J. S. Hyatt, John Dewhurst, A. J. Sarre, Myles Lambert, A. B. Gibson. Col. W. V. Bingham, representing the Personnel Research Federation, was also present at the invitation of Mr. Dana.

Suspension Lifted on Pittsburgh Line

Service on the Evans Avenue, McKeesport route, of the Pittsburgh Railways, operated at a 3-cent fare and suspended on Nov. 27, has been restored by the railway pending settlement by the Public Service Commission of the use of the one-man cars on a route of this kind. The withdrawal of the service was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 8, 1928.

$106,000 Christmas Bonus for B.-M.T. Employees

Bonuses totalling $106,000 will be distributed shortly to 3,300 employees of the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., who have earned them during the past year under the various plans to promote safety and efficiency of operation. These bonus awards are in addition to awards totalling $27,000, paid by the system in August to 1,100 employees on the rapid transit lines for efficient and courteous service.

Lease of Seattle Lines Proposed

Declaring a confirmatory vote by the people would be necessary under the city charter to legalize adoption of the plan, Karl H. Kaye, Seattle investment broker, on Dec. 10, urged the Seattle City Council to submit at the next city election an ordinance accepting the proposal of himself and associates to lease the Seattle Municipal Railway System. Accompanied by his attorney, Mr. Kaye appeared in person and urged the Council to an early decision. The matter is now in the hands of the Council franchise committee for consideration and recommendation.

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Mr. Kaye and his associates are proposing to lease the municipal railway lines for 50 years, pay off the bonded debt immediately, operate the system for the term of the lease, finance necessary extensions and improvements, and then turn the lines back to the city free of indebtedness. In connection with the railway lease, however, Mr. Kaye asks for a 50-year exclusive franchise for operation of taxicabs and sightseeing cars.

"Stay Alive" Movement Will Seek 20,000,000 Members

To promote safe and careful driving and walking on public streets and highways, "The Stay Alive Club of America, Inc.," has been formed and will solicit membership from 20,000,000 registered motorists. The directors are Marcus A. Dow and Sidney H. Somerton, New York, and William Boal, Port Chester. Mr. Dow was president of the National Safety Council from 1922 to 1923. He has just written a series of talks on safety for drivers and pedestrians which are brought together in a book called "Stay Alive," reviewed in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 8. The club will be engaged in the dissemination of entertaining and instructive literature looking toward the education of the people in safety.

Free Rides in Amsterdam

A surprise "free" ride awaits the shopper in Amsterdam, N. Y., through a movement sponsored by the Merchants' Bureau of the Chamber of Commerce which will last until Christmas. On the inbound cars of the Fonda, Johnstown & Gloversville Railroad the free ride is in vogue, but is not known by the shopper until the conductor refuses her fare. One free trip is being made by all the lines from the suburban and residential sections.

Will Bid for Service in Springfield

In accordance with a decision made recently by the City Commission of Springfield, Ohio, an advertisement for proposals for a transportation system for that city will be inserted in local newspapers. In this advertisement, the City Commission will ask for proposals for electric railway, bus and combined railway and bus service. The proposals must contain terms and conditions suitable for a future franchise, and must state for how long a period of time the franchise is desired.

One of the important stipulations of the commission's request is that bidding utilities shall state the rate of fare to be charged. While the rate of fare will be taken into consideration by the commission and will be considered an essential feature of the proposal, City Commissioners indicate that the main object in asking for proposals is to secure an adequate system of transportation.

Recent Bus Developments

Merger for Brooklyn

Plan now under way would bring B.-M.T. surface routes under separate company with bus auxiliary

ANNOUNCEMENT that the Equitable Coach Company, New York, would seek modification of its franchise was made by Mayor Walker on Dec. 19, following a four-hour conference, attended by members of the Board of Estimate, Transit Commission and Board of Transportation, and officials and counsel of the B.-M.T. and the Equitable. Earlier in the day the Transit Commission suspended all proceedings in the Equitable's pending application for certificates of necessity and convenience for its franchise routes. The action was taken when the commission was notified that the petition to modify the franchise would be presented to the Board of Estimate.

The steps presage the move to merge the bus routes of the Equitable Coach Company in Brooklyn and Queens and the surface lines controlled by the B.-M.T. into a single corporation entirely divorced from the B.-M.T.'s subway and elevated lines.

The merger contract was among the documents presented to the Board of Estimate on Dec. 20. The petition for modification of the franchise, it is understood, calls for abandonment of some Brooklyn bus routes as originally approved by the Board of Estimate, and the lengthening or shortening of others.

Ultimate approval of the plan by the Board of Estimate and the Transit Commission is expected to provide the following set-up:

1. Merger of B.-M.T. trolley lines and Equitable bus routes in Brooklyn, with the expenditure of from $10,000,000 to $15,000,000 by the new surface transportation company for new cars, buses and other equipment. Bus franchise for Brooklyn to be terminable upon due notice of recapture at price representing actual investment less depreciation, with possibility that trolley car franchises may be changed to terminable type instead of being left perpetual as at present.

2. Operation of 82 miles of bus routes by B.-M.T.'s new corporation in Queens, under same type of terminable franchise, on routes not to conflict with Queens trolley car lines.

3. The Equitable to retain its franchise rights in Manhattan, where it has cross-town routes only. It is understood that the B.-M.T. is to assist in the $4,000,000 of financing required for buses, garages and other equipment.

4. The Equitable stockholders to be paid by the B.-M.T. in securities of the new corporation to the extent of actual money expended by Equitable to date, the amount to be proved at hearings before Transit Commission and not to include any valuation of the franchise rights transferred.

The New York *Times* said:

The Brooklyn City Railroad, with 208 miles of surface lines in Kings County, is left out of the agreement between the B.-M.T. and the Equitable, but the merger contemplates a combination of bus and trolley routes which will not compete with its lines. The merger contract is so drawn as to permit the fitting in of the Brooklyn City Railroad system with the merger routes in the future to make a comprehensive surface transportation layout for the borough. This prospect of ultimate merger of all Brooklyn surface lines is one factor which leads transit circles to believe that the present move is a step toward acquisition of the B.-M.T. rapid transit lines by the city, as part of the general rapid transit unification scheme.

A commentator said:

Word of the merger contract was received in transit circles as confirmation of the report, current in recent months, that the Equitable, balked in efforts to obtain sufficient financial backing and faced with the possibility of protracted litigation over the validity of the franchise and of any certificates of necessity and convenience which it might obtain from the Transit Commission, would be forced to make the best terms possible with the B.-M.T. Although the Walker Administration is not enthusiastic over acquisition of the franchise by any of the existing traction systems, it is felt that the contemplated merger, if properly safeguarded and put through under a system of terminable franchises paving the way to ultimate unification of the city's rapid transit lines, will be a forward step.

The Equitable Company's application to the Transit Commission for certificates of necessity and convenience met with strong opposition from the B.-M.T. in a long series of hearings before the Transit Commission. That body reached a decision on Nov. 15, but deferred announcing it when informed that the Equitable and B.-M.T. were negotiating over route allocations.

Detroit Jitneys Threaten to Come Back

Jitneys are again appearing on the streets of Detroit under the guise of the Michigan Mutual Auto Owners' Service Corporation. The new company was formed according to a scheme originated by Edward N. Barnard, who acted as counsel for the jitney organizations during the six-year fight which intervened between the time of the passage of the jitney ordinance and the recent Supreme Court decision which upheld the city's right to oust the jitneys. The plans of the corporation were outlined by Mr. Barnard in a talk over the radio. It is intended to return practically all of the former jitneys to their respective runs, unless some step is taken by the city to prevent such action.

All of the jitneys, it was announced, had been transferred to the new corporation. A chauffeur and garage service are to be provided for each car, these items to be supplied by the corporation.

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No fare is charged for riding on the jitneys but in lieu of collecting fares, the corporation is offering for sale membership cards which entitle the holders to ride at any time without further payment. Thus no money will change hands in the jitneys. Instead the passengers merely show their membership cards before boarding the jitneys. The charge announced for membership is $5 a month.

This charge is based upon the assumption that regular riders formerly paid at least 20 cents per day for a round-trip ride. All ticket holders are considered members of the corporation, and are regarded as joint owners of the automobiles which can be used only by those holding tickets. It is planned to change the color of membership tickets each month.

The vehicles being used are the same automobiles formerly owned and operated by the members of the Blue Ribbon and the Red Star Motor Drivers' Associations.

Mr. Barnard, their sponsor, says that with the automobiles the property of the participating members, he has made them private cars, and that it will not be necessary for them to have licenses as common carriers. It is further contended that efforts to bar the cars of the corporation from the streets will be nothing short of class legislation.

No efforts have been made by the Detroit Police Department to stop the limited number of white cars that have been put back on their routes, but only a few passengers are being carried. The matter of the next step to be taken by the city rests with Corporation Counsel Clarence E. Wilcox.

Pending Settlement Would Discontinue St. Louis Line

Permission has been sought by the St. Louis Public Service Company of the Missouri Public Service Commission to abandon temporarily its bus service connecting Maplewood, Webster Groves and Kirkwood, Mo., via the Big Bend and Manchester Roads. The commission on Nov. 2, ordered the De Luxe Bus Company, which was operating over the same route, to suspend operations. That company has ignored the commission's order and is running buses in competition with the St. Louis Public Service Company fleet. As a result, the bus line is costing the railway $165 a day more than receipts. The company wishes to suspend operations until the St. Louis Circuit Court has passed upon the right of the De Luxe company to continue in business over the route.

Bus Changes in Boston

The Boston Elevated Railway, Boston, Mass., started operating an additional bus line on Dec. 16 and changing the route of another. Fares are four tickets for 25 cents without transfer privilege and a 10-cent fare with transfer privilege.

Sale of Gary Bus Project Being Arranged

Negotiations for the purchase of the Midwest Motor Coach Company of Gary, Ind., by a new corporation headed by Charles W. Chase, president of the Shore Line Motor Coach Company, are well under way. The Shore Line Motor Coach Company is controlled jointly, through common stock ownership, by the Chicago, South Shore & South Bend Railroad and Gary Railways, both of which lines are subsidiaries of the Midland Utilities Company, Chicago. The Shore Line system is composed of approximately 230 route miles with through service provided between Chicago and Benton Harbor, Mich., and local service in northwestern Indiana. The Midwest Company operates a fleet of coaches between 63rd Street, Chicago and Whiting, Indiana Harbor and Gary. The proposed purchase has not yet been approved by the Indiana Commission.

Mr. Chase announced that the Midwest Motor Coach Company would be operated as a separate unit if the negotiations are successful. Both companies would continue to operate coaches between Gary and 63rd Street, Chicago. The service would be coordinated, however, for the benefit of the traveling public.

In arrangements for the purchase, Mr. Chase said he was acting in an individual capacity. It is understood that the proposed purchase does not involve outright acquisition of the securities of the Midwest company but only its physical assets and coach equipment.

The Shore Line company holds a franchise from the Indiana Commission to carry passengers on its Gary-Chicago route only between points in Indiana and destinations in Illinois. The franchise held by the Midwest company, on the other hand, permits it to handle local business within the state of Indiana as well as interstate traffic. Last summer the two companies became involved in a rate war which reduced through fares nearly 50 per cent.

Formal Franchises Asked for Syracuse Buses

Formal petitions for franchises for bus lines, instead of the yearly permits now in vogue, were presented to the Common Council of Syracuse, N. Y., recently and referred to the franchise committee without reservation. They bring nearer the effort which the bus owners have been making to better their financial standing by obtaining perpetual grants. If new grants are made on the new basis, they may mean a 7½-cent ticket and a 10-cent cash fare on the motor lines, as is charged on the trolleys.

Application for a fifth line, to serve the eastern part of the city, has been made by Benjamin E. Tilton, vice-president of the New York State Railways. In return for the perpetual rights, the bus lines agree to cover 10 additional miles on the four routes now in operation in addition to the proposed new line east.

They also declare that they will buy twelve new buses to add to the nineteen now in use. The railway has spent nearly $170,000 for bus equipment.

Express Service Planned on Jacksonville Line

The permit granted by the City Council to the Jacksonville Traction Company, Jacksonville, Fla., for the operation of a bus line from Laura and Forsyth Streets to Avondale and Murray Hill will be signed and become operative when the company files the necessary bond with the city recorder. According to J. P. Ingle, manager, the company plans to operate large capacity buses on the line and to give express service to residents of Murray Hill and Avondale to the downtown section of the city.

Pennsylvania Company Issues Complaint

Complaint against the Tri-State Motor Freight Company, of Philadelphia, alleging it is operating between Philadelphia and Easton and Allentown and Bethlehem without a certificate of public convenience was filed with the commission by the Lehigh Valley Transit Company, Allentown, Pa.

Pittsburgh Railways to Expand

Under plans made known through presentation of petitions to the Public Service Commission in Harrisburg, the Pittsburgh Railways and its subsidiary, the Pittsburgh Motor Coach Company, expect to operate the street cars and motor buses of other companies along the Monongahela River, including areas nearly 50 miles from this city. If approved by the commission, the change will be effective Feb. 1. More than a dozen large towns and villages in the upper valley will be affected. Coordination of suburban transportation facilities in the Monongahela valley is sought, it was declared as part of the company to provide "more adequate service."

The petitions seek approval by the commission of agreements whereby the Pittsburgh Railways would operate the West Side Electric and the Webster, Monessen, Bellevernon & Fayette City Street Railways.

The Pittsburgh Motor Coach Company asks permission to operate the West Side Motor Transport Company. Four motor coaches and a number of street cars, the latter operating on about 32 miles of trackage, are said to be involved.

The move for operation under this plan was said to have been made at the solicitation of the smaller companies. By co-ordinating schedules, local railways men held, better service could be provided without additional cost.

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Interstate Bill Introduced

New measure introduced by Representative Parker requires certificates of convenience and necessity

A NEW bus bill, to replace the one lost at the last session of Congress, was introduced in the House on Dec. 20 by Representative James S. Parker of New York, chairman of the interstate and foreign commerce committee.

The new measure differs from the old one mainly in the requirement of certificates of "public convenience and necessity" for interstate bus lines and the filing of applications with the Interstate Commerce Commission.

Closer appreciation of each other's problems was reflected in the agreement recently reached on the draft of the suggested bill. Four major changes mark this draft when compared to the Parker bill. Most important is the method of considering and granting certificates of convenience and necessity. Next to that in significance is the agreement upon Nov. 1, 1928, as the date for the grandfather clause. Third is the inclusion of a declaration of policy concerning administration which states that nothing contained in Sec. 500 of the transportation act of 1920 shall be construed to express a policy of Congress in favor of any form of transportation by motor vehicle, or to affect the issuance of a certificate for a bus company deemed proper in the public interest after all pertinent facts and circumstances have been duly considered on their merits. And last is the exemption of interstate motor carriers from the provisions of the Clayton anti-trust act, which makes illegal the consolidation of competing interstate lines. This latter idea applies to two or more motor carriers as well as to a railroad and a motor carrier.

In brief, the new method of considering and granting certificates gives the primary jurisdiction to representatives of the state commissions. However, they act as federal agents, thus reducing greatly the possibility of the measure being unconstitutional.

Under the new draft an application for a certificate would be made to the I.C.C. This body would refer it to a joint board consisting of a representative from each of the states in which the route lies. This representative would be designated by the state commissions either from its own membership or staff, or from the membership or staff of another state commission which is interested in the proceeding. If any state (or states) fails to designate a representative, the joint board would function without him. If no representatives were designated by any of the states, the I.C.C. would hear the case.

Each joint board would decide the matter referred to it. The decision would be filed with the I.C.C. Barring appeals the commission would issue an order or certificate in accordance with the decision of the joint board. If the latter should fail to reach a decision on an application or fail to hear the case within 60 days, the entire matter would then come before the commission for definite action.

Contentions in Burlington Upheld

The Vermont Public Service Commission upheld the Burlington Traction Company, Burlington, Vt., recently on all of its objections and refused to grant a bus petition to W. S. Appleyard. At two hearings the company contended before the Public Service Commission that the proposed bus line would be in direct competition with its own route in the South Union and Pine Streets section of the city. It also brought out that 3.3 miles of the proposed line would parallel the tracks of the railway.

William S. Appleyard, who would operate the buses, said that the line was a public necessity since the public wished to ride in buses.

Confessions of a Taxi Driver

"IN ORDER for a taxi to take in any money, it is necessary to keep wheeling all the time that one is on duty. I work from about 10 a.m. to 3 a.m. every morning.

"We were instructed to run on the street car lines and drive very slowly past each corner, as our street pickups were a large percentage of our business. The best stands are located at the corners and (after 10:30 p.m. we could stand all our cars on the street, procuring many more loads from people waiting for street cars) and opposite the theater which is close to —— and —— streets.

"Other business consists principally of people who are regularly street car riders going to and from business. There are very few tips from this type. This type of clientele was largely the working class of people with the exception of our night business.

"However, as one owner quits, there seems to be two to take his place, they assuming that they can well compete with street car service. This same assumption brings forth jitney competition. Why is it allowed?

"I have learned that this jitney and taxi competition in small towns has caused the abandonment of street car operation. I have also learned that due to this competition, certain factors of street railways in large cities have been lopped off. Of course, this results in a greater expense to those whose work and business requires purchased transport means. How long will it be before wage earners and others of industrial communities may tumble to these facts?"—*Motorman, Conductor and Motor Coach Operator.*

Substitution Planned in Connecticut

The Connecticut Company, New Haven, Conn., has petitioned the Public Utilities Commission to discontinue railway service between Torrington and Winsted and between Thomaston and Waterbury. Permission is also sought to cease service in Portland and across the Connecticut River Bridge from Portland to Middletown. The latter service will be replaced by bus transportation to operate from the Gildersleeve post office to Hillside Avenue, South Farms. All three lines have been operating at an increasing loss despite efficient and economic operation, according to the company.

Wants Proposals for Operation in Buffalo

Mayor Frank X. Schwab of Buffalo is asking the International Bus Corporation, a subsidiary of the International Railway, Buffalo, N. Y., and other interests to submit proposals for the operation of buses over a route which would connect the new terminal of the New York Central Railroad with the principal downtown hotels, a distance of almost 3 miles. The Mayor says he will recommend to the City Council the granting of a franchise to the company which will operate buses at the lowest rate of fare. The new passenger terminal of the New York Central will be completed and placed in operation about April 1, 1929. No street car or bus lines now reach the section of the city in which the station is being built.

Rights of Roads on Bus Operation Upheld

The operation by a railroad of a subsidiary bus line without the authority of the Interstate Commerce Commission is permissible under the present law and does not constitute a violation of the interstate commerce act, in the opinion of Examiner Leo J. Flynn.

Dealing with a complaint of an Oregon bus company against the practices of the Spokane, Portland & Seattle Railway in operating a subsidiary bus line, Examiner Flynn reported to the commission that the jurisdiction of the federal body does not cover truck or bus service which extends beyond terminal districts and becomes what is commonly designated as a line haul and which may in effect act as an extension of the lines of the carrier.

The Spokane road, the report explained, organized a new company called the Spokane, Portland & Seattle Transportation Company, which operated a bus line between Portland and Astoria, Ore. All of the capital stock of the transportation company is owned by the railroad. The competing bus line charged in its complaint that the railroad had violated the interstate commerce act by extending its lines (through the bus service) without seeking government permission.

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Financial *and* Corporate

Passenger Revenue from Madison Fares Increases

Gross passenger revenue from fares of the Madison Railways, Madison, Wis., for November, 1928, showed an increase of $289 over the total reported for a similar month last year. The total for the month this year was $36,700 compared with $36,410 reported a year ago. Railway revenue alone for the month showed a decrease, with only $31,571 reported for November this year compared with $32,246 reported a year ago. Passengers carried on street cars at Madison during November totaled 416,669. This represented fewer passengers than the average for a similar month during the four years between 1920 and 1924 when 592,598 passengers were carried.

Further Steps in Omaha Bridge Negotiations

Stockholders of the Omaha & Council Bluffs Street Railway are shortly to pass on the question of what price will be fixed for the purchase of the bridge across the Missouri River connecting the two cities. The company also holds title to the lines in the Iowa City. The disposition of these lines is of moment also, because without the bridge and without their operation, in connection with the Omaha lines, they probably could not be operated except at a loss.

Some stockholders who have been interviewed on the proposal say that they should be paid the par value of their stock. This is $1,500,000, and the sale made subject to the $2,000,000 bonds, callable at $2,100,000, as well as the lien of $893,000 held by the Omaha company. The stock has been paying a 4 per cent dividend, because of the $60,000 yearly bridge rental paid by the Omaha company, and has been quoted at $25.

Mayor Dahlman of Omaha says that the joint commission named by him and Mayor Green of Council Bluffs will take no action until after the first of the year. Meanwhile, the commission is gathering necessary data for a new bridge and also a statement of the cost, revenues and operation of the present bridge. Bills are being framed by the corporation counsel for passage by Congress and the Iowa and the Nebraska Legislatures, that will give the cities power to construct or buy a bridge across the interstate stream.

President Shannahan holds that the question of purchasing the present bridge should be settled before others are negotiated. He says the railway would prefer to retain ownership because it cannot hope to receive as its share of any sale price, any amount that will compensate for the $200,000 a year net the lease brings, but being an Omaha institution it must be ready to sacrifice something in allowing the people to have what they wish. That sacrifice must be kept as low as possible, however, because whatever is lost in bridge revenues to the railway might have to be made up in rates. This year more than $100,000 of the net profit on the lease, for which the company pays $60,000 a year, was used to pay interest on railway bonds.

Suburban Road in New York Does Better

A marked reduction both in operating revenues and in operating expenses characterized the operations of the Auburn & Syracuse Electric Railroad, Syracuse, N. Y., for the quarter ended Sept. 30, over those of the corresponding period the preceding year. Here are the comparative figures:

	1927	1928
Railway operating revenues	$92,497	$49,874
Railway operating expenses	82,093	31,846
Net revenue, railway operations	$10,404	$18,028
Taxes assignable to railway operations	4,689	912
Operating income	$5,714	$17,116
Non-operating income	608	487
Gross income	$6,322	$17,604
Total deductions from gross income	22,472	22,472
Net corporate loss	$16,151	$4,869

Increase in Capital Stock of Indianapolis Company

The officials of the Interstate Public Service Company, Indianapolis, Ind., have filed papers with the secretary of state showing an increase in the capital stock of 125,000 shares of no par value common and $2,500,000 preferred.

Merger Sought for Worcester Companies

Approval has been given by the Massachusetts Public Utilities Commission to the petition of the Worcester Consolidated Street Railway, Worcester, Mass., to take over the property and franchises of the Worcester & Shrewsbury Street Railway and the Worcester & Shrewsbury Railroad. The tracks of the two companies connect with the tracks of the Worcester Consolidated and are leased by them.

Recent hearings disclosed that all the common stock of the three companies is held by the New England Investment & Security Company. Bentley W. Warren stated that a merger was desired to eliminate the cost of rental of the tracks of the two small companies and to bring about a single organization. The two Worcester-Shrewsbury companies concurred in requesting the merger.

More Shares of St. Louis Stock to Be Offered

The St. Louis Board of Estimate and Apportionment has voted to sell 15,820 shares of St. Louis Public Service Company stock to provide funds with which to complete the Civil Courts Building now under construction. Previously the city sold 400 shares of the stock at $83 a share. A minimum of $80 a share is placed on the 15,820 shares.

Brooklyn Income Decreases Slightly

For the five months ended Nov. 30, 1928, total operating revenues of the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., were $20,000,198 against $19,551,991 for the five months ended Nov. 30, 1927. Total operating expenses increased from $12,840,031 to $13,142,902 for the current year. After the consideration of total income deductions, the net income for the five months' period of this year was $2,432,231. This compares with $2,460,432 for the period ended November, 1927.

Part Payment of Denver Preferred Dividend

The Denver Tramway Corporation, Denver, Col., has declared a quarterly dividend of 75 cents a share on its preferred stock, which is at the rate of only 3 per cent whereas the stock calls for 7 per cent. The directors say:

Any increase in the dividend is not warranted just now. At the time the statement of earnings and expenses for the nine-month period, Jan. 1 to Sept. 30, was given to the public, it was accompanied by the announcement that operating revenue for the period had decreased $67,843 and that operating expenses for the same period, due to strict economy and the fact that maintenance was subordinated to a reconstruction program, and in some instances, deferred, had decreased $90,365.

Operating revenues continue to show a decrease, but it is the opinion of the officers and the board that the curtailment in expenses cannot be continued for any sustained period without detriment to the property and public service. Any increase in the dividend under these circumstances is not warranted until such time as there is an adjustment which will result in increased operating revenue. Furthermore, sinking fund requirements approximating $225,000 per annum, which must be met to prevent defaults in mortgages securing bonds, must also be considered in arriving at the net income.

Partial Discontinuance in Connecticut

Discontinuation of railway service between Rockville, Conn., and Martin's Corner has been announced by the Connecticut Company. Service will be maintained between Rockville and West Bridge, Snipsic Lake, on reduced schedule. Four trips to this point will be made daily, except Saturday when only one trip will be made. There will be no service at all on Sunday.

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Cincinnati Railway Holdings to Car Company Owners

As noted elsewhere in this issue stockholders of Cincinnati Car Company have approved terms of merger with Versare Corporation, Albany, N. Y., into a new company, the Cincinnati Car Corporation. From the deal there will be excepted 89,661 shares of Cincinnati Street Railway stock, ownership of Cincinnati Traction Building Company and earnings and profits of Cincinnati Car Company for 1928. The stockholders of the Cincinnati Car Company have authorized the distribution of Cincinnati Street Railway stock to Cincinnati Car Company stockholders, also the formation of the Cincinnati Traction Building Company, a holding company.

Additional Directors for Engineers Public Service

The directors of the Engineers Public Service Company recently elected as additional directors, W. Cameron Forbes, partner of J. M. Forbes & Company of Boston and Governor General of the Philippines under President Taft, and Thomas N. Perkins of the Boston law firm of Ropes, Gray, Boyden & Perkins. Both men have been connected with the Puget Sound Power & Light Company, recently acquired by Engineers Public Service, for more than 30 years and are now among its directors. The properties controlled by the company include the Virginia Railway & Power Company, operating in Richmond and other cities in Virginia.

Strang Line in Receiver's Hands

An interurban, the Strang line, operating between Kansas City and Olathe, has gone into receivership because of inability to meet interest payments on second mortgage bonds. The application for receivership was made by the Fidelity National Bank & Trust Company, trustees for the second mortgage bondholders. Judge George T. McDermott, of the Federal Court in Kansas City, Kan., appointed George A. Clark, Topeka, receiver and J. F. Rhodes, Kansas City, attorney for the receiver. In January, 1927, the company was compelled to default in the payment of interest on its bonds. Increasing use of the private automobile by people living along the line is blamed for the shrinkage in revenue.

The company was incorporated in 1905 by the late W. B. Strang as the Missouri & Kansas Railway. It soon came to be better known as the Strang line. The company is capitalized at $1,777,000 of which $1,000,000 is in stock, $500,000 in first mortgage bonds, and $277,000 in second mortgage bonds. Thomas Riley, builder of the road, has been vice-president and general manager since its completion. Mr. Strang died several years ago, but it is understood his estate retained stock in the company.

The company lists physical assets of 22 miles of tracks and a right-of-way extending from the western city limits of Kansas City to Olathe; five passenger coaches; two freight cars, shops and carhouse at Overland Park.

Providence Company Would Issue Securities

Petitions by the United Electric Railways, Providence, R. I., for the issuance of stocks and bonds to reimburse it for for capital expenditures have been filed with the Public Utilities Commission.

The United Electric Railways, in one petition, seeks authority to issue $265,800, principal sum, prior lien mortgage 25-year 6 per cent gold bonds; $60,000 general refunding mortgage 30-year gold bonds and 170,200 shares of common capital stock.

Another petition by the same company seeks authority to issue $280,000 principal sum prior lien mortgage 25-year 6 per cent gold bonds, and 500,000 shares of common stock to reimburse its treasury for like purposes.

Anticipated Returns in Portland

Passenger revenue of the Cumberland County Power & Light Company, Portland, Me., for September, 1928, was $97,025 against $93,294 for a similar month a year ago. In October, 1928, passenger revenue was $100,025 against $93,611 for October, 1927. These figures reflect the anticipated results of the fare increase which became effective on July 1, 1928, and show an improvement over the July returns on the higher fares. In that month revenues increased 4½ per cent.

Rates provide an initial cash fare of 10 cents for a two-zone ride or less, and a 5-cent cash fare for each additional single zone. School tickets are on the basis of 5 cents for a continuous ride of three zones or less and are valid for a two-zone ride or less.

Discontinuance on One Chattanooga Division

Upon petition to the Tennessee Railroad and Utilities Commission, the Chattanooga Traction Company was granted permission to discontinue service on the Woodland Heights division, effective Feb. 1, 1929. The petition set out that the railway was losing $400 monthly in the operation of the line.

Market Street Earnings Hold Up

H. M. Byllesby & Company announce that net earnings, including other income of the Market Street Railway, San Francisco, Calif., for the twelve months ended on Nov. 30, were $1,465,949, compared with $1,644,323 for the previous year. Gross earnings were $9,795,829, against $9,827,296.

Holding Company Organized by Delaware & Hudson

The Delaware & Hudson Railroad has been incorporated in New York State by the Delaware & Hudson Company to own and operate the railroad properties of the Delaware & Hudson. Organization of the new company follows authority granted to the directors by shareholders to segregate the railroad assets into a new corporation, all of whose stock would be owned by the Delaware & Hudson Company. Completion of the latest step will leave the Delaware & Hudson Company strictly a holding corporation, owning all of the stocks of the two operating companies which will run the coal and rail business and owning stocks in electric railways and other enterprises.

Under its old charter granted more than one hundred years ago, the Delaware & Hudson Company has been operating by an act of the New York State Legislature. Its rail operations under this charter, according to L. F. Loree, president, have been restricted more than those of companies running under the general railroad law of the state.

The Delaware & Hudson Company is not selling to the new corporation its miscellaneous properties. The new company, parceling the railroad lines separately, would make it more feasible for the Delaware & Hudson to dispose of its railroad interests if such appeared best in the settlement of the Eastern consolidation plan.

In the wake of the additional news of the proposed segregation of the properties of the Delaware & Hudson Company comes the statement that the company will shortly announce the sale of its system of electric railway properties in northern New York State. The Delaware & Hudson entered the electric railway business at about the same time the New Haven did, although on a much smaller scale. It is said to be the desire of the management to dispose of these properties, now that earning power is being shown by the electric railways following the increase of the fare in the Albany district to 10 cents and the abandonment of some of the unprofitable interurban mileage.

The Delaware & Hudson Company now owns the United Traction Company of Albany. This system with subsidiaries controls more than 216 miles of electric railway serving the cities of Albany, Cohoes, Rensselaer, Troy, Watervliet, Glens Falls and Ballston. In addition, the company owns half the stock of the Schenectady Railway, the other half being owned until recently by the New York Central Railroad.

This electric railway system constitutes one of the most important in the State from the point of view of mileage. The liness were acquired in 1905 by the Delaware & Hudson, and represented an initial investment of approximately $14,500,000. Later, large advances were made by the parent company to help develop these lines and meet their fixed charges.

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Personal Items

J. H. Morgan Appointed Auditor in Detroit

John H. Morgan, Detroit City Statistician and former member of the Michigan State Tax Commission, has been appointed auditor of the Detroit Department of Street Railways, by the street railway commission. It has been announced that the auditor will retain his position as city statistician. Mr. Morgan, the commission announced, will make a financial survey of the Detroit Street Railway, the first step toward an up-to-date audit being a complete appraisal of the property. This, it is expected, will require several months. Mr. Morgan has had extensive experience in auditing utilities, including the Detroit Edison Company, Michigan State Telephone Company and the Detroit City Gas Company.

The audit made by Price, Waterhouse & Company, covering the conditions of the Detroit Street Railway system up to June 30, 1928, is to be brought up to date by Mr. Morgan, using the same methods employed in auditing private utility companies. Several audits have been made in the past by Price, Waterhouse & Company, differing from those of the Detroit Street Railways' auditor on the manner of figuring depreciation. The different methods of approach to this problem have been the subject of discussion previously in the ELECTRIC RAILWAY JOURNAL. They are a matter of interpretation of the conditions under which the system is run.

Employee Elections in Buffalo Co-operative Association

Robert H. Gilbert, Niagara Falls, a motorman on the Niagara Falls high-speed line division of the International Railway, Buffalo, N. Y., was elected president of the International Railway Employees' Co-operative Association for 1929, at the annual meeting of the organization held in Buffalo. Isidor Spati, air compressor repairman in the mechanical department at the Cold Spring station, was elected vice-president.

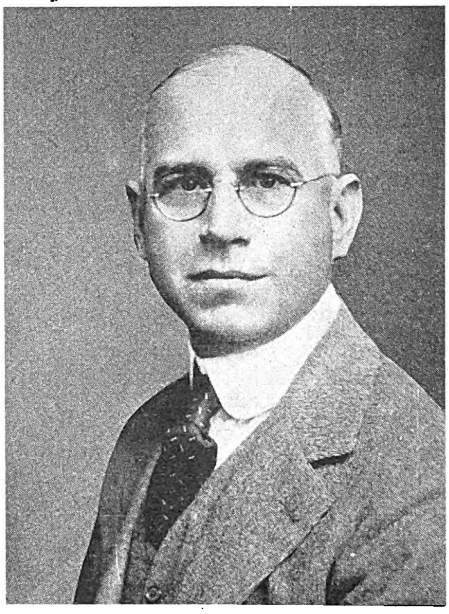
Changes in El Paso

H. C. Webb, Jr., sales manager of the El Paso Electric Company, El Paso, Tex., since March, 1927, has been transferred to the Virginia Electric & Power Company as sales manager at Richmond. In this capacity he has served at Baton Rouge and at Lake Charles as superintendent of sales of the Gulf States Utilities Companies.

J. H. Warden returns to El Paso to fill the vacancy caused by the withdrawal of Mr. Webb. At the time of his transfer to Lake Charles, La., in March, 1927, he was acting sales manager at El Paso. He also has had considerable experience with other Stone & Webster properties.

R. B. Stearns to Devote Time to Personal Interests

When Robert B. Stearns, vice-president, general manager and treasurer of the Eastern Massachusetts Street Railway, Boston, Mass., resigns on Jan. 15, 1929, he hopes to avoid a lot of



R. B. Stearns

the pressing details of business activities, but by no means does he plan on being idle. As indicated previously in the JOURNAL, Mr. Stearns will continue as a director of the company. The effective date of his resignation coincides with the date of expiration of the ten-year public trusteeship. Mr. Stearns has managed the property during these entire ten years; in fact, he went with the road in the summer of 1917 from a long and varied street railway experience in the Middle West.

The Bay State Street Railway, which was the predecessor of the present Eastern Massachusetts Street Railway, was already headed for receivership when Mr. Stearns took charge in the summer of 1917. In December of that year the road did go into a receivership and in June, 1919, it passed under the control of a board of five public trustees. Mr. Stearns brought to this system modern methods and has witnessed—indeed has taken the most prominent part in achieving—the entire transformation of the Eastern Massachusetts Street Railway from a bankrupt system extending throughout the entire eastern part of Massachusetts to one now in most excellent physical condition, with restored finances and greatly improved *esprit de corps*.

It will be recalled that under the supplementary public control extension act, which has been accepted by stockholders of the Eastern Massachusetts, a new board of three public trustees will be appointed by the Governor to operate the road for five years dating from next Jan. 15. One of the first important duties of the new board will be to select a successor to Mr. Stearns.

It is generally agreed that in leaving the road after giving practically his entire time to it during the past eleven years, Mr. Stearns does so with the present physical and financial condition of the company in a highly satisfactory condition.

Hoover to Name Seven to Interstate Commerce

Before he leaves the White House President Coolidge must name two members to the Interstate Commerce Commission and a third named as a recess appointment must be confirmed by the Senate. Claude R. Porter, Iowa Democrat, a lawyer formerly with the Federal Trade Commission, was appointed by the President to fill the unexpired term of Henry C. Hall, ending Dec. 31, this year. Patrick J. Farrell, former counsel for the commission, has not been confirmed yet as commissioner. The term of Clyde B. Aitchison, Republican lawyer, of Oregon, appointed first in 1917, expires this year.

At the end of 1929 the terms of Joseph B. Eastman and Richard V. Taylor expire. Mr. Eastman was appointed from Massachusetts by President Wilson. He is regarded as the leader of the "liberals" on the commission. Mr. Taylor, appointed from Alabama by Mr. Coolidge, is the only former railroad executive on the commission.

In 1930 the terms of Thomas F. Woodlock and Frank McManamy end. Mr. Woodlock is a Coolidge appointee. He has frequently dissented from majority rulings of the commission. Mr. McManamy, a Democrat, was appointed by Mr. Harding.

Johnston B. Campbell and Balthasar H. Meyer are slated to retire at the close of 1931. Mr. Campbell, another Harding appointee, is a lawyer from the state of Washington. Mr. Meyer, economist and professor, has been with the commission since he was appointed by Taft in 1911.

Only one commissioner's term ends in 1932, that of Ernest L. Lewis, former newspaper writer, appointed from Indiana by Mr. Harding and reappointed by President Coolidge in 1925. Ezra Brainerd, appointed by President Coolidge to succeed Commissioner J. J. Esch, will be in until 1933.

D. E. BELL, general manager of the St. Helens Corporation Tramways, England, has been appointed general manager of the Yorkshire (Woollen District) Electric Tramways.

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Paul Shoup Heads Southern Pacific

Official long directing head of Pacific Electric Railway and other railways operating 1,500 miles of electric railway made president of western railroad empire

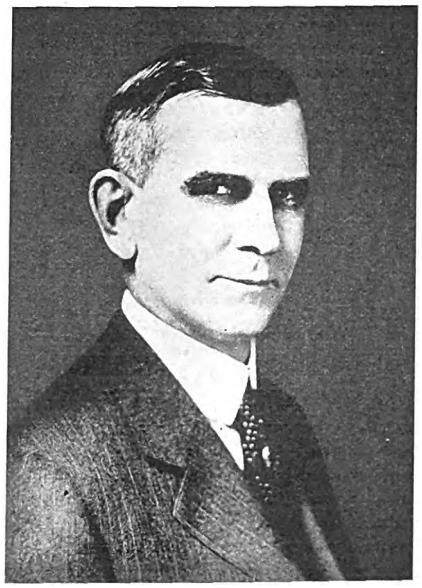
PAUL SHOUP, vice-president of the Southern Pacific Railway, president of the Pacific Electric Railway, first vice-president of American Electric Railway Association and an officer of the electric railways controlled by the Southern Pacific, has been elected president of the company to succeed William Sproule.

Announcement to this effect caused very little of a stir. For this there is very good reason. Toward the post to which he has been elected, Mr. Shoup, it has long since been recognized, was directly headed. He has been with the Southern Pacific since 1891. Over the years his advance was not spectacular, but he climbed from post to post, being signally honored on July 11, 1918, when he was elected a director, vice-president and assistant to the president of the Southern Pacific Company. While his election made him one of the highest officials of the Southern Pacific, Mr. Shoup did not sever his connections with the Pacific Electric Railway, of which at that time he had been president since 1912. He was the executive representative of the Southern Pacific Company on the Pacific Coast with headquarters in San Francisco. He also continued to have general supervision over the Pacific Electric Railway and at that time succeeded William Sproule in connection with the various corporations in which the Southern Pacific Company is interested.

As president of the Pacific Electric Railway, in which he succeeded William F. Herrin, Mr. Shoup has been responsible for the management and operation of one of the largest systems of city and interurban lines in the United States. The properties embrace 1,060 miles of road, with very diversified service. They are known particularly for their high-grade service and for their excellent personnel.

Prior to 1912 Mr. Shoup was vice-president of the lines. Before becoming connected with the Pacific Electric Railway he was assistant general passenger agent of the Southern Pacific Company. He entered the service of the Southern Pacific Company in 1891 as a clerk in the office at San Bernardino, Calif. When the narrow-gage railroad between Riverside and San Bernardino went into the hands of a receiver, Mr. Shoup was practically in charge, and he is said to have been largely responsible for converting the road into a paying investment. Mr. Shoup next entered the passenger department of the Southern Pacific Company. Soon thereafter he went to San Jose as district freight and passenger agent of the road. He went to Portland, Ore., later and reorganized the freight department of the Southern Pacific Company in that city.

From December, 1908, until April, 1910, Mr. Shoup gave his time to the interests of the late E. H. Harriman in California not related to the Southern Pacific Company. Prior to his election as vice-president of the Pacific Electric Railway Mr. Shoup was assistant general manager of the Southern Pacific Company, in charge of its electric lines in California, which included the Los Angeles-Pacific Company and Peninsula Railway, San Jose.



Paul Shoup

In addition to being president of the Pacific Electric Railway, Mr. Shoup at the present time holds among other electric railway offices those of president of the Visalia Electric Railroad, vice-president of the Fresno Traction Company, vice-president of the Northwestern Pacific Railroad and president of the Stockton Electric Railroad. The electric railway systems of which he is an officer, operate about 1,500 miles of track.

MACK NOMBURG, newspaper man, was appointed as assistant secretary to the New York Transit Commission recently to succeed George Wood. Mr. Nomburg was on the staff of the New York City News Association.

R. HOGGARD, formerly general manager of the Lincoln Corporation Tramways, England, has been appointed general manager of the Chesterfield Corporation transport undertaking succeeding W. G. Marks, who was recently appointed general manager of the Nottingham Corporation Tramways. The Chesterfield undertaking was recently converted from tramway to bus. Mr. Hoggard's previous experience includes positions with the tramway undertakings of Sheffield, Wigan and Lincoln.

"Success" to Virginia Men

In the November issue of *Vepcovian*, the official publication of the Virginia Electric & Power Company, Richmond, Va., best wishes and good luck are heaped upon J. Frank McLaughlin, Tom P. Walker and Joseph Bowes, whose promotions were referred to in ELECTRIC RAILWAY JOURNAL, issue of Nov. 17. Mr. McLaughlin has been promoted from vice-president in charge of operation at Richmond to district manager of the Stone & Webster properties in Texas, Louisiana, New Mexico and vicinity. Mr. Walker, formerly vice-president of the company in the Norfolk district, succeeds Mr. McLaughlin. Joseph Bowes goes from the El Paso district to the Norfolk district as vice-president of the company.

Change in Louisville Legal Staff

Charles W. Milner was elected general counsel of the Louisville Railway, Louisville, Ky., at a recent meeting of the directors and also a director and a member of the executive committee. He was formerly assistant general counsel. He succeeds Churchill Humphrey, who has tended his resignation to the board after serving as general counsel since 1920.

Mr. Milner is a native of Atlanta, Ga. In 1909 he received the LL.B. degree at the University of Louisville. He is a member of the law firm of Humphrey, Crawford and Middleton.

OBITUARY

JOHN J. APPEL, vice-president of the Indianapolis Street Railway, vice-president of the Terre Haute, Indianapolis & Eastern Traction Company, director of the Terre Haute Traction & Light Company and other corporations, died recently. He was also president of Gregory & Appel, Inc., and was a well-known capitalist and business promotor in Indianapolis. Although a conspicuous figure in the utility field, he never served in the operating end, but lent his genius toward improving enterprises and working out the financial organization of properties. Mr. Appel was 69 years old.

RICHARD M. KERSCHNER, associated with Hubbard & Company for the past sixteen years, died on Dec. 8, in Zelinople, Pa. Upon leaving school Mr. Kerschner obtained a position with the old Chicago Edison Company, with which he remained until 1900 when he joined the sales force of the Union Electric Company of Pittsburgh. In 1914 he joined the sales department of Hubbard & Company, later becoming sales manager. In 1924 he supervised the buiding of the new Hubbard factory at Oakland, Calif., remaining in charge there until 1927 when he returned to Pittsburgh to assume charge of the department of development and research, in which position he was active up to the time of his death.

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Large Equipment Orders Pending

Lackawanna asks bids on $18,000,000 electrification. Brooklyn consolidation may mean $15,000,000 car order. $5,000,000 terminal for St. Louis. New freight interchanges being constructed by South Shore Lines

PLANS recently announced have advanced to the place where the Delaware, Lackwanna & Western Railroad, Hoboken, N. J., is inviting bids for its electrification project. The initial cost will be from $10,000,000 to $12,000,000 for track, rolling stock and distributing equipment. If satisfactory arrangements for power supply are not made, the company will build its own power station which will mean an added cost of about $4,000,000. The ultimate cost of the entire electrification is approximately $18,000,000. Unlike the Pennsylvania Railroad electrification from Wilmington to New York, which will use 12,000 volts, the Lackawanna has decided to use 3,000 volts direct current. It is not planned to extend the electrification beyond the suburban district for some time.

Possibility of Large Car Order

From $10,000,000 to $15,000,000 will be spent for cars by a new company, if the plans go through to which reference is made elsewhere in this issue, for the consolidation of the surface lines of the Brooklyn - Manhattan Transit Company and their separate operation, and for that company to take over the grants for bus operation already made to the Equitable Coach Company, subject to confirmation by the Transit Commission. The new company would probably start to function early in 1929.

Construction of three new freight interchanges with major steam railroads has been started by the Chicago, South Shore & South Bend Railroad, Michigan City, Ind. Work is now under way on the interchange with the New York Central Railroad at South Bend, Ind., consisting of two interchange tracks, each of nineteen-car capacity. The interchange tracks now being laid at Michigan City will open freight connection with the Michigan Central Railroad and the Chicago, Indianapolis & Louisville Railroad.

Seventy-pound rail laid on treated ties and cinder ballast will be used on each project. The interchange tracks will be electrified for use of the South Shore Line electric locomotives and will employ light catenary overhead. Completion of these three projects will bring the South Shore Line into direct connection with thirteen steam railroads, and a number of belt lines will insure switching connections with all the principal railroads entering Chicago.

St. Louis Terminal

The Missouri Public Service Commission, in an order issued Dec. 13, grants the Illinois Terminal Company, Springfield, Ill., and the St. Louis Electric Terminal Railway, St. Louis, Mo., a certificate of convenience and necessity for the construction of a $5,000,000 terminal in St. Louis, to include a subway and elevated line. These subway and elevated lines will connect the McKinley Bridge with a new freight and passenger terminal in the blocks bounded by Twelfth Boulevard, Lucas Avenue, Eleventh Street and Washington Boulevard.

Electric operation of 80 miles of the main line of the Great Northern Railway, St. Paul, Minn., has been started between Wenatchee and Skykomish, Wash. Completion of this part of the project along with the boring of the 8-mile cascade tunnel which will be ready for trains shortly after the first of the year, and the relocation of 20 miles of east approach to the tunnel, represents an expenditure of $25,000,000 by the Great Northern Railway in improving its route across the cascades.

California Construction

In California bids have been called for by the Northwestern Pacific Railroad, San Francisco, Cal., for the construction of a new depot at D Street, San Rafael. This company has also awarded a contract to the Austin Company of California, to construct a $32,500 machine shop at Tiburon, Cal.

The St. Louis Public Service Company, St. Louis, Mo., has started the construction of its new office and shop addition to the De Baliviere Avenue carhouses. The new building will be a two story structure, costing about $40,000. The Springfield Street Railway, Springfield, Mass., and the Worcester Consolidated Railway, Worcester, Mass., have sold wire, rails, poles, and other accumulated equipment amounting to $2,060,718.

The city commissioners of Kansas City, Kan., have announced that they would request the Kansas City Public Service Company to remove and replace with a permanent structure, the wooden street car incline leading from the east end of the Central Avenue Viaduct to the surface at First Street and Central Avenue. The present incline was built in 1923 and was said to cause traffic congestion.

Rolling Stock

The Chicago South Shore & South Bend Railroad, Michigan City, Ind., has ordered two caboose cars from the American Car & Foundry Company. The Lynchburg Traction & Light Company, Lynchburg, Va., is building a loop in Peakland and has purchased land near Fairview Heights for a "Y" switch which is to be used in turning the one-man cars to be tried out by this company next month. It is planned to bring a new Birney one-man car to Lynchburg for trial. The International Bus Corporation, subsidiary of the International Railway, Buffalo, N. Y., has rebuilt six of its double-deck passenger buses. The stairway to the upper deck has been shifted from the rear of the bus to the front, which enables the bus driver to collect fares. These buses have been equipped with semi-enclosed tops, making it possible to heat the upper deck during the winter months. Additional light has also been installed. In the near future the company plans to remodel in a similar manner other double-deck buses on its system.

Cleveland Railways, Cleveland, Ohio, has placed an order with the White Company for twenty 40-passenger buses. This order is the result of recently placed bids for 25 new buses. The Louisville Railway, Louisville, Ky., has placed orders for two Club-type Studebaker buses. Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., has ordered two A.C.F. Fageol De Luxe, street-car type buses, and the Eastern Massachusetts Street Railway has purchased one A.C.F. De Luxe urban-type coach. The Indianapolis Southeastern Railway, Indianapolis, Ind., has purchased five 22-passenger Seminole parlor observation-type Studebaker coaches.

Equipment Orders

Among orders of equipment purchased recently, the Lehigh Valley Transit Company, Allentown, Pa., has ordered two miles of No. 00 grooved copper trolley wire, two miles of No. 8 weatherproof wire, 400 bags of rock salt, 5,000 type M brake shoes, No. 3153, 1,000 type M brake shoes No. 3154, 56 bags of Tucolith, five 63-tooth gears, six sets of armature coils, 2,500 rolls of friction tape, 2,000 lb. of No. 097 double covered magnet wire and 2,000 lb. No. 9 double covered magnet wire. This company has also purchased 5,000 ft. of snow fence complete with posts and caps, one six-section model steam boiler, and miscellaneous sizes of machine chains.

The Georgia Power Company, Atlanta, Ga., has purchased two electric switching and throwing devices, one signal block and one electric switch, 100 30-ft. creosote pine poles, 1 mile of No. 00 copper wire and 200 26-in. car wheels. The Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., has ordered small supplies of car equipment. The Duluth Street Railway, Duluth, Minn., has purchased 160 class B, 30-ft. Western red cedar poles.

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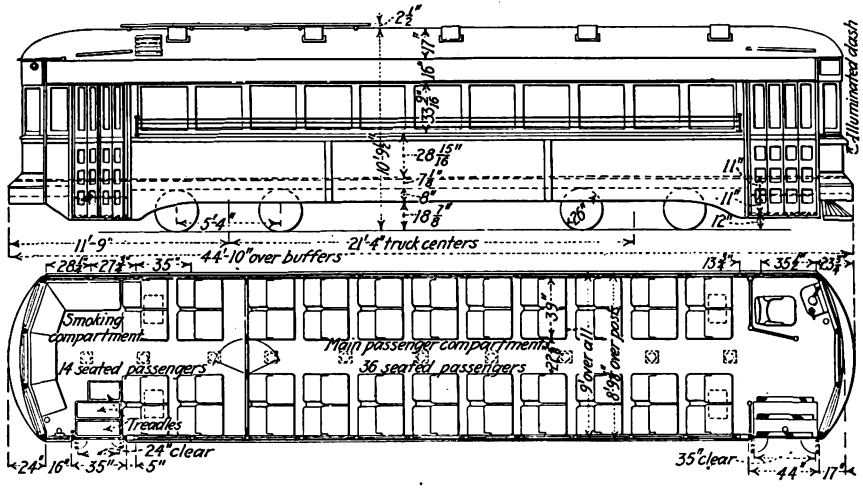
Specifications of Two Cars for Gary

Midland Utilities Company, Chicago, Ill., has ordered two one-man motor passenger cars from the Cummings Car & Coach Company for the service on the lines of the Gary & Southern Traction Company, which was recently purchased by the Midland Utilities Company and is being operated by the Gary Railway, Gary, Ind.

These cars are of the interurban, single-end, double-truck type, seating 50 passengers. They weigh 42,000 lb. each and are 44 ft. 10 in. long and 9 ft. wide. The bodies are of all-steel construction with arched roofs and folding end doors and are finished in orange and maroon lacquer. The trucks are equipped with two inside-hung motors and 26-in. steel wheels. Both armature and journal bearings are of the plain type. Further details of these cars are given in the following specifications:



Cars being built for Gary & Southern Traction Company seat 50 passengers

Date of order	Oct. 10, 1928
Date of delivery	Feb. 20, 1929
Length over all	44 ft. 10 in.
Truck wheelbase	5 ft. 4 in.
Width over all	9 ft.
Height, rail to trolley base	11 ft.
Window post spacing	35 in.
Body	Steel
Roof	Arch
Doors	End, folding
Air brakes	General Electric
Armature bearings	Plain
Car signal system	Faraday
Compressors	GE. CP. 27
Conduit	Flexible
Control	G.E. K-75
Curtain fixtures, Rex-National Lock Washer Company	
Curtain material	Black Pantasote
Destination signs	Hunter
Door mechanism	National Pneumatic
Energy saving device	Economy meters
Fare boxes	Ohmer
Finish	Lacquer
Floor covering	Rubber tiling
Gears and pinions	General Electric
Glass	Plate
Hand brakes	Cummings
Heaters	Truss plank-Railway Utility
Headlights	Golden Glow
Headlining	¼-in. Agasote
Interior trim	Haskelite
Journal bearings	Plain
Journal boxes	Service
Lamp fixtures	Electric Supplies Company
Motors	Four G.E. 247, inside hung
Painting scheme	Orange and maroon
Registers	Ohmer
Roof material	Canvas
Safety car devices	Safety Car Devices Company
Sash fixtures	O. M. Edwards Company
Seats	Hale & Kilburne; bucket type, non-reversing
Seat spacing	35 in.
Seating material	Grey Byzantine plush
Slack adjusters	Anderson
Steps	Folding
Step treads	Kass
Trolley	Ohio Brass retrievers
Trolley base	General Electric
Trolley wheels	Holland
Trucks	Cummings No. 64
Ventilators	Railway Utility Company
Wheels, type	Davis one wear, steel, diameter 26 in.

Cincinnati Car-Versare Merger Approved

Stockholders of the Cincinnati Car Company at a special meeting Dec. 14, gave unanimous approval to the merger agreement entered into by the directors of their company and those of the Versare Corporation of Albany, N. Y., as had been anticipated in announcements made a number of weeks ago.

The two plants will be merged in the formation of the Cincinnati Car Corporation, with headquarters in Cincinnati. The engineering facilities and offices of the Albany corporation will be brought to the Ohio city, but physical property will remain at Albany.

To effect the merger, the Cincinnati Car Corporation will purchase all the assets of the Cincinnati Car Company except 89,661 shares of stock of the Cincinnati Railway Company, the Traction Building in Cincinnati and the earnings and profits of the company for the year 1928. The stock will be distributed to stockholders of record at the close of business Dec. 31, 1928. The Cincinnati Car Company will receive for the assets which will be retained for manufacturing purposes, 125,000 shares $20 par value 7 per cent preferred stock and 50,000 shares of Class B stock without par value of the Cincinnati Car Corporation.

The stockholders at their meeting authorized the formation of the Cincinnati Traction Building Company to accomplish a complete distribution of the assets of the Cincinnati Car Company. The Traction Building Company will be the holding concern for the building, surplus holdings, profits for 1928 and the fractional shares of stock of the Cincinnati Street Railway Company, and the 7 per cent and Class B shares of the newly formed corporation—which stocks can not be distributed in kind because of the small fractions into which they would have to be split. Authorization was given the directors to sell these undistributable assets and to make cash distributions of the proceeds.

The agreement provides for issuance to the Versare Corporation of 10,000 shares of Class A stock without par value for all the property of that firm, including patent rights. This stock will be subordinate in claims for assets and earnings, to the 7 per cent preferred stock which the Cincinnati Car Company stockholders will receive. The Versare company will also receive 50,000 shares of Class B stock without par value as additional payment for its interest.

Public Hearing Held on New York Car Contract

The New York Board of Transportation, building the city's new subway system, held a public hearing Dec. 19 on the draft form of contract for the construction of 300 steel cars for operation from Chambers Street to the Harlem River and 207th Street by the fall of 1930. The hearing was conducted by John H. Delaney, chairman of the board, and Commissioner Daniel L. Ryan. It was attended by numerous representatives of railroad car manufacturing corporations in the eastern part of the country.

In opening the public hearing, Chairman Delaney said that it was the first time in the history of rapid transit in New York City that the car and signal contracts for subway service were prepared by municipal engineers and designers. He related how a group of outside engineers and practical railroad car builders had been in consultation with the engineers and designers of the Board of Transportation for the past year, working out the best possible design and specification which would permit of the widest competition in bidding for the work of car construction.

The Transportation Board Chairman paid public acknowledgment of the gratitude of New York City toward those experts for their gratuitous assistance and advice. He named James S. Doyle, Assistant to General Manager Frank Hedley of the Interborough; W. J. Gove, superintendent of equipment for the B.-M.T. system; A. E. Ostrander, assistant vice-president of the American Car & Foundry Company; W. H. Mussey, general mechanical engineer for the Pullman Company; and W. P. Potter, chief engineer of the General Electric Company.

The Board of Transportation engineer in charge of equipment and operation is Harry N. Latey. The car designer is John O. Madison.

In the presence of representatives of the Pressed Steel Car Company, the Standard Car Company, the Pullman Company and the American Car & Foundry Company, counsel for the latter made some observations of the specifications as drawn for the new cars. The

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observations dealt mainly with penalties for non-performance, patent restrictions and other minor points. Brief memoranda were filed by representatives of the several car manufacturers, relative to legal questions and provisions of the Labor Law as being not applicable to other states.

The draft form of contract in the main was not objected to, but some of the car manufacturers asked for more time in which to study the technical construction features of the proposed new cars. Whereupon, Chairman Delaney suggested that each of the larger manufacturers assign a delegate or representative, highly qualified, to discuss with the engineers of the board the various features of the proposed contract.

The public hearing was then adjourned to Thursday, Jan. 3, at 11:30 A.M.

Towne Service Building Dedicated

The new service building of the Yale & Towne Manufacturing Company, Stamford, Conn., was formally dedicated on November 26th. Funds approximating $500,000 for the erection and care of this building, which will be known as the Towne Service Building, were provided through a special bequest in the will of the late chairman of the board, Henry R. Towne, and this building represents his plans and purposes for the progression and advantage of the thousands of the company's workers, both now and in the future. The structure is modern in construction and up to date in heating, lighting and ventilation facilities, and will admirably serve as a recreational center for the thousands of employees of the company.

The main floor houses the works hospital, dental clinic, and industrial relations bureau. The second floor has a large auditorium, gallery and stage, with a seating capacity of 400. The commodious library is also located on this floor. In the basement are four bowling alleys and two pool tables.

A motion picture outfit will also be installed for the entertainment of the employees.

Government to Publish Catalog

While the federal standard stock catalog is being prepared primarily for the government service, it is believed that its usefulness could be extended to the commercial field. For this reason it is planned to have copies of the catalog—either complete or in sections—made available for sale through the superintendent of documents, Government Printing Office, as soon as possible after the printing of the book is authorized by Congress.

As the assignment of nomenclature to the items comprised in the catalog is based on a truly scientific system, it is believed that its adoption as a standard will be welcomed by industry and will have a widespread and beneficial effect in the commercial field.

METAL, COAL AND MATERIAL PRICES F.O.B. REFINERY

	Dec. 18, 1928
Metals—New York	
Copper electrolytic, cents per lb.	15.775
Copper wire, cents per lb.	17.875
Lead, cents per lb.	6.5
Zinc, cents per lb.	6.7
Tin, Straits, cents per lb.	49.5
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.	$4.375
Somerset mine run, f.o.b. mines, net tons.	1.875
Pittsburgh mine run, Pittsburgh, net tons.	1.80
Franklin, Ill., screenings, Chicago, net tons.	1.425
Central, Ill., screenings, Chicago, net tons.	1.15
Kansas screenings, Kansas City, net tons.	1.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$5.5
Weatherproof wire base, N. Y., cents per lb.	18.625
Cement, Chicago net prices, without bags.	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.4
White lead in oil (100-lb. keg), N. Y., cents per lb.	13.2
Turpentine (bbl. lots), N. Y., per gal.	0.645

The importance of exactness and uniformity with respect to nomenclature cannot be overemphasized. With a single standard of nomenclature in general use, the transactions of individuals, firms, industries, and the government—both inside and outside their organizations—would be greatly facilitated, uncertainty would disappear and the routine of supply and procurement standardized, expedited and made more economical.

The government's requirements in the way of supplies and materials cover a very great variety. This is reflected in the catalog by the segregation into 81 classes for storage and issue of the upwards of 60,000 items it will list. Furthermore, this is shown by the fact that these commodities are obtained from 61 main groups of industry, which are further subdivided wherever specialization in industry has developed.

The work of compiling the federal standard stock catalog has been advanced to a point where several of its sections can be published, as soon as funds for its printing are made available by Congress. The bureau of the budget has given its approval to the project, and the question of providing the necessary funds for printing will be laid before Congress at the coming session.

TRADE NOTES

O. M. Edwards Company, Syracuse, N. Y., has announced that T. P. O'Brian will have entire charge of its sales in the railroad, traction and bus fields in the Eastern and Southern districts. Mr. O'Brian has opened up a new office at 50 Church Street, New York City, and will be assisted by George B. Allison in his new work. Mr. O'Brian started his career in the railroad field in the service of the Pullman Company, working in various capacities until 1910 when he left the Pullman Company to become associated with the O. M. Edwards Company. In 1916 he accepted a position with the Curtain Supply Company in its sales department, having charge of the Southern district. In 1922 Mr. O'Brian was made Eastern sales manager for the Curtain Supply Company, remaining in this position until the company was merged with the Adams & Westlake Company in 1927, when he took charge of the combined Eastern offices in New York City. Mr. Allison became associated with the Curtain Supply Company the early part of 1919 and after three years service in the factory and general office, he became office manager. In 1922 Mr. Allison was transferred to the Eastern sales office in New York City working under the direction of Mr. O'Brian. Mr. Allison will have charge of the Southern district.

Timken Roller Bearing Company, Canton, Ohio, has established two new permanent offices, one in Los Angeles, Cal., and one in Seattle, Wash. The former will be in charge of Roy Cross, with address at 1361 South Figueroa Street, Los Angeles, and the latter in charge of Marshall Cooledge, with address at 321 South Pine Street, Seattle. G. C. McMullen remains as district manager at the company's San Francisco office.

J. W. Fristoe, president and general manager of the T. J. Moss Tie Company, St. Louis, Mo., since 1902, on Dec. 5 was elevated to chairman of the board while E. E. Pershall, vice-president, was elected president. J. S. Penney, who has been general superintendent, becomes vice-president.

H. A. Houston, Wilkinsburg, Pa., has been appointed works manager of the R. D. Nuttall Company, makers of Westinghouse-Nuttall gears, according to an announcement by Vice-President Milton Rupert.

ADVERTISING LITERATURE

Compressed Air Society, New York, N. Y., has issued the third edition of its "Trade Standards" pamphlet. It has been considerably enlarged and improved, comprising 47 pages in 8½x11 in. size, with numerous illustrations and tables that will be of assistance in the treatment of various compresser problems. New material that has been added includes a description of the A.S.M.E. standard air receivers with list standard sizes of these receivers; pneumatic tool standards; a section on portable compressors; and additional information relating to the installation and care of compressors.

General Electric Company, Schenectady, N. Y., has issued booklets No. 1012 entitled, "Electric Heat in General Electric Factories" and No. 482A on "Silent Gears." The latter booklet gives physical specifications, application data, formulas for helical gears, recommended practice for machining Fabroil blanks, recommended practice for machining Textolite, and dimensions of the various types of gears and blanks.

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BRILL MODERN CARS

THE knowledge gained by our corps of trained service engineers is invaluable to you as operators of electric railway equipment. Improvements are constantly being made in Brill products as the result of the accumulative experience of these men. As soon as a particular design or engineering detail has become obsolete, it is discarded. If a better way of doing things is discovered and found practical, the industry benefits accordingly. In this manner, Brill products such as cars, trucks, seats and sundry parts are constantly maintained on a high level of workmanship and engineering exactness.

During the early part of 1929, new Brill products of outstanding importance to the industry, will be announced. They promise to eclipse everything heretofore introduced by any manufacturer of electric railway equipment.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

Pacific Coast Representative: Rialto Bldg., San Francisco

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HASKELITE

NORTH SHORE LINE

SOUTH SHORE LINE

Both choose these light weight plywood panels

THE South Shore Line is having 15 cars built by Standard Steel Car Company in which wainscoting, bulkheads, door panels and partition panels are of HASKELITE.

The North Shore Line (under affiliated control) has been a repeated user of HASKELITE products. Leading roads like these appreciate the advantages of great strength, light weight, beauty and permanence provided in these blood glue plywood panels. Available at no greater cost than ordinary inferior types of construction.

Ask for our blueprint booklet for street car and bus applications.

Haskelite Manufacturing Corporation

120 South LaSalle Street, Room 1120, Chicago, Illinois

PLYWOOD HASKELITE PLYMETL

Railway Representatives:

Economy Electric Devices Co., 37 W. Van Buren St., Chicago.

Grayson Bros., 600 LaSalle Bldg., St. Louis, Mo.

Railway & Power Engineering Corp., Ltd., Montreal, Toronto, Winnipeg, New Glasgow

PLYWOOD HASKELITE PLYMETL

PLYMETL

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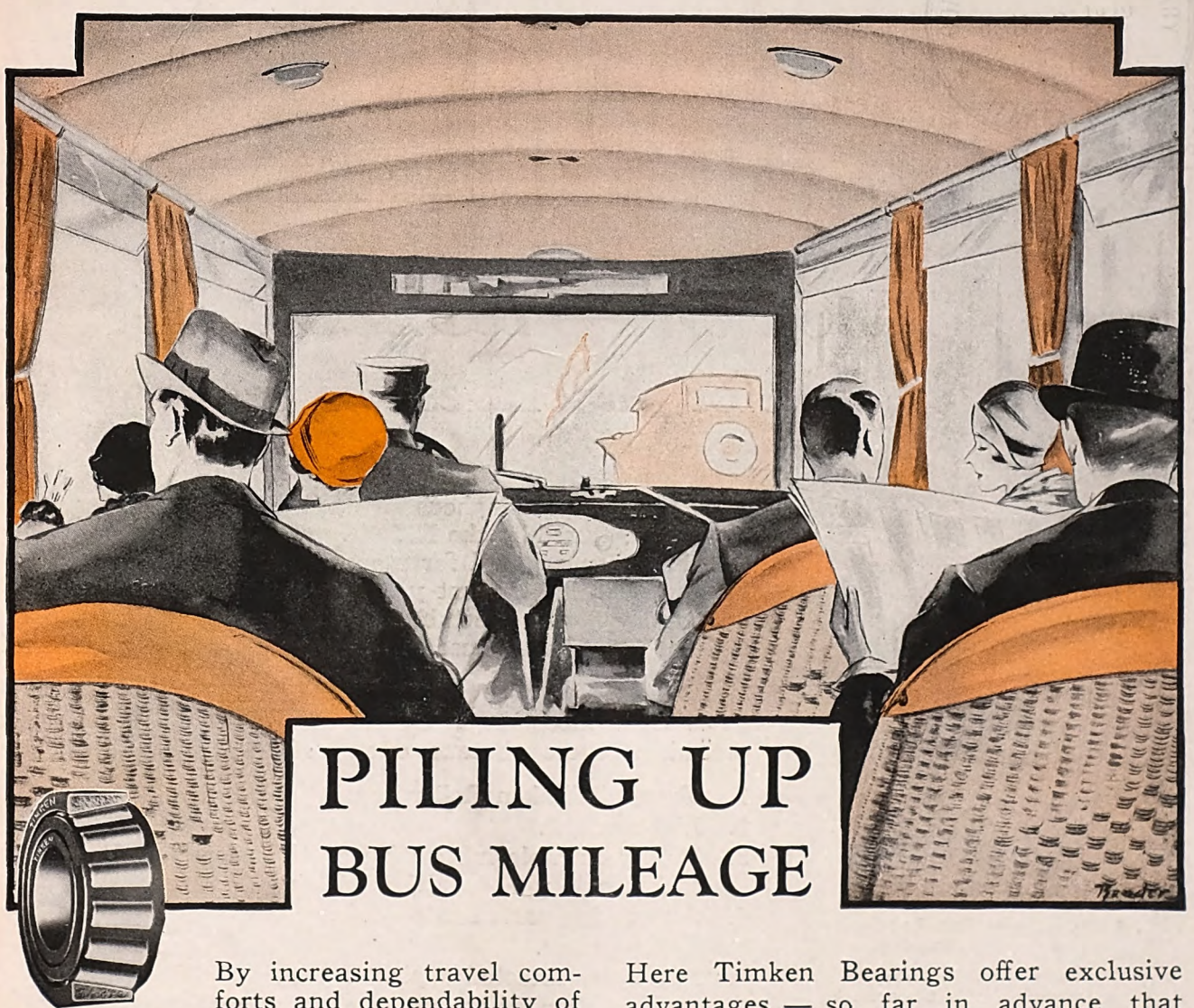

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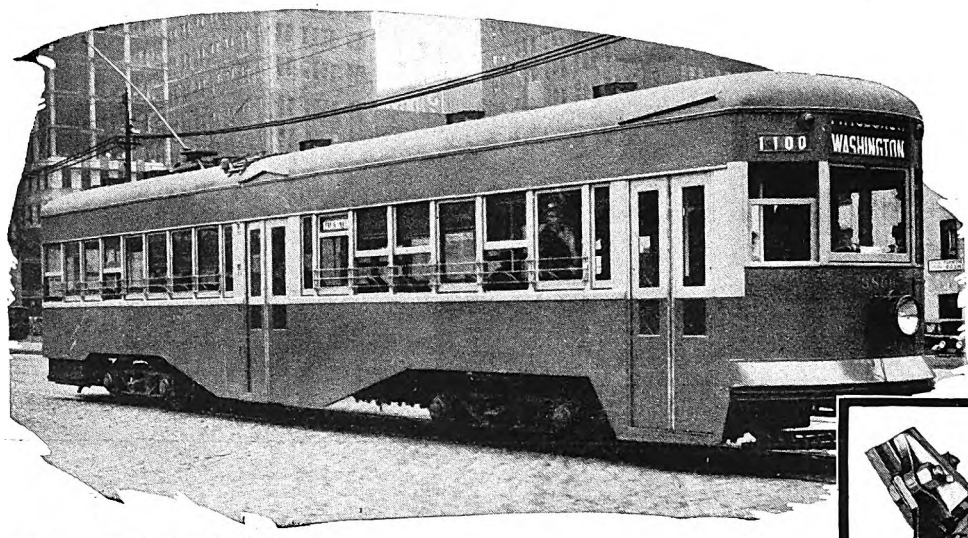

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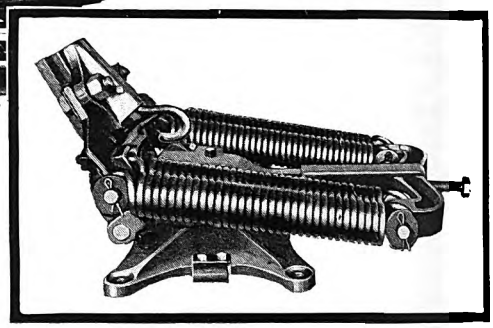

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Electric Railway Journal

Consolidation of
Street Railway Journal and Electric Railway Review

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"The Greatest Law Suit in History"

INTEREST on the part of the electric railways in the so-called O'Fallon case is not so remote as it at first might seem to be. The company's brief has been filed with the Supreme Court and the argument has been set for Jan. 2. The St. Louis & O'Fallon Railroad is resisting the efforts of the Interstate Commerce Commission to collect the recapturable portion of the alleged excess earnings of the carrier for the last ten months of 1920 and for the years 1921, 1922 and 1923. The amount which the commission is seeking to recapture in these proceedings is only $226,880 and interest. But the question of the principles of valuation seems involved, which is the reason for the attention attracted by the case.

The majority ruling of the Circuit Court held the commission's determination valid, with the specific reservation that the method used in arriving at the value on which the earnings in percentage are calculated should not enter into the case. The minority concurred in the judgement, but expressed the opinion that the commission's valuation method was justified, although defective in some particulars. It seems that the road earned more than 6 per cent on the full valuation claimed by it. The point the majority made was that under such circumstances a claim of confiscation could hardly be made. The brief of the company recently filed with the Supreme Court makes the point that in fixing the valuation of a railroad for recapture purposes under the transportation act, consideration should be given to all relevant facts and circumstances, including the present level of reproduction costs.

The O'Fallon case was the first decision by the Interstate Commerce Commission interpreting and applying the so-called recapture clause of the transportation act of 1920. Since no definite rule of valuation was laid down in that act, the commission proceeded on its own initiative. By a vote of six to four it held in effect that the value of the property for rate-making purposes, as determined by the commission for 1914, approaches more nearly the reasonable amount to be allowed on the property than the cost of reproduction. It based the valuation on its tentative valuation figures of 1919 (based on 1914 unit prices) as far as available, allowing for property added in succeeding years at actual cost less depreciation, without giving effect to the cost of reproducing the original property at present-day prices. The idea of cost of reproduction new at prices current on the valuation date, laid down as a rule in previous court decisions, was rejected by a majority of the commission on the ground that it would prevent stability of rates and that it was unjust and unworkable. Between that method and the use of 1914 unit prices as a base, the commission held no intermediate practice was "possible which is capable of being applied to any rule independent of the caprice of those who apply it."

Adoption of 1914 prices by the commission appears to be justified by that body on the theory that this schedule of prices is fair to all concerned. This question of a fair basis of valuation is obviously of major importance to every form of regulated utility. A member of the Interstate Commerce Commission is said to have referred to the case as "the greatest law suit in history." Should the Supreme Court by chance decline to pass upon the valuation and confiscation questions and affirm the previous ruling, the railroads would be back where they started on the valuation issue. Not only that, but utilities in general would be deprived of the benefits of a ruling that would tend further to clarify the much contested question of proper valuation. The fact that no utility other than a railroad is affected by the "recapture" statute does not lessen the general interest in the case, provided, of course, the Supreme Court in its decision does deal with the matter of the basis of the valuation.

There Is Danger in the Lure of New Business

IN ONE of his well-known fables, Æsop tells how a dog, carrying a piece of meat in his mouth, saw in the water of a stream he was crossing, what appeared to be another dog also carrying a piece of meat. Opening his mouth to snap at the reflection in the water, and dropping his own piece of meat, he realized his folly too late.

In the transportation industry, new forms of business appear extremely alluring. This is particularly true of new bus business. Chartered trips, special tours, de luxe operation at higher fares, and similar types of service offer an attractive means of augmenting transportation revenue. The harassed manager, weary of trying to render adequate mass transportation service for an inadequate fare, turns with enthusiasm to this new field where there seems to be a chance to make a reasonable profit. This is as it should be. The attractive opportunity which he envisages is far more substantial than the shadow seen by Aesop's dog. It is well worth going after—but it should not divert attention from the all-important task of holding fast to existing business by improvements carried out with enthusiasm comparable to that manifested in developing a new field of operation.

The straphanger in a crowded, dirty, old-fashioned street car is not particularly interested in the fact that the same company operates attractive de luxe bus service on some other route. What he wants is good service on his own route. That the company operates special bus service is no reason that it should not also render good mass transportation service, but it sometimes happens that enthusiasm for the former results in neglect of the latter. The outcome of such a policy cannot be other than disastrous. Special service holds much promise as a supplement to regular service. In the long run, however, the company's fate will be determined by the quality of its regular service, which is the backbone of the community transportation system.

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Ten Years of Service at Cost in Rochester

NEGOTIATIONS seem likely to begin soon for a renewal of the service-at-cost contract under which the Rochester Lines of the New York State Railways are operated. The present contract, drawn for a period of ten years, remains in effect until Aug. 1, 1929. That the contract will be renewed seems quite likely. It also seems quite likely that the contract will be modified. There have been some differences of opinion about the valuation figure, but while the railway officials believe that a higher valuation is justified, they are understood to be willing to allow the present figure, $20,314,905, to stand.

The situation in Rochester has been changed recently by the operation of the high-speed line built in the old canal bed. Some modification in the contract may be necessary because of this operation, although other changes that may be made are a matter of speculation at this time. But in the light of the coming negotiations the figures on operation in Rochester for the year ended July 31, 1928, digested in the JOURNAL for Dec. 15, are of special interest. To recapitulate them is not necessary. It is of interest, however, to note that riding continues to decrease. This decrease in passengers over the previous year was 5,180,000, or 7.7 per cent. For the year there was a surplus from trolley operation of $67,898, but this was offset by a deficit of $60,105 on the bus lines and a deficit of $8,123 from subway operation, making the total deficit for the year $329, compared with a deficit of $60,128 for 1927. The accumulated deficit for the period of the service-at-cost contract as of July 31, 1928, was $341,791.

Full account of the fact that some of the bus lines have been extended into territory that cannot for the present be expected to afford a return is taken by the commissioner of railways of the city in his report. He is apparently opposed to economies that would impair the character of the service, for he says that there is only reasonable fulfillment of the requirements for comfort and convenience of passengers. There is no disposition to suggest further economies at the expense of the patrons' comfort. In other words, Rochester wants service and is prepared to pay for it. If that were not so then the fact would have been manifested following the recent announcement by the company that on Jan. 1 cash fares will go to 10 cents. The ticket rate will, however, remain at twelve for a dollar.

While Rochester appears to be willing to pay, there is no disposition to be profligate. Out of the fourteen lines operated in the city only two are handled with one-man cars, with some additional use of this type of equipment on other lines on Sundays and during hours of light travel. Mr. Barnes, the commissioner, holds that the serious reduction in the number of passengers carried by the trolley cars in the service-at-cost territory requires that, if possible, some steps be taken to change this condition. He feels that this can best be done, as demonstrated by the experience of other cities, by extending the use of one-man cars to other lines and reducing the headway on these lines during the non-rush hours, thus improving the service while at the same time reducing the cost.

On the whole, it is a broad view of the matter to which Rochester apparently subscribes, particularly since the railway commissioner has reiterated the fact that co-ordination of transportation in the manner now existing in Rochester is becoming increasingly necessary and favored throughout the country. The service-at-cost type of franchise was adopted originally in Cleveland as a way out of a very complicated situation. The grant there had to be modified in the light of subsequent experience. That also was true in Toledo. It may prove true in Rochester. It does appear, however, that Rochester is in a position to profit immeasurably from its own experience and the experience of others. Regardless of the details of the new contract, so long as it adheres to the principles of co-ordination and adequacy of service above other considerations Rochester will not go far wrong.

Ideals Flow Through Channels of Human Contact

TWO questions immediately confront the management which plans to keep its employees informed on company affairs so that they may be properly equipped to capitalize the opportunities offered by their contacts with the public. First, what information should be given to the employee, and second, what methods should be employed in transmitting this information to the rank and file of the operating organization? Actual practice today varies widely with differences in policy and attitude on the part of railway managements.

In general, however, it is almost self evident that employees should have a working knowledge of the general economic problems that confront an electric railway, with particular attention to the principal factors that are controlled by the public's attitude toward its railway. In addition, employees should be furnished with specific information concerning the activities of the company. If the platform man realizes the effects of the radio, the private automobile, the taxicab and other forces of competition, he will recognize the need for meeting this competition and will be able to talk intelligently about his company's affairs to those of the public who inquire.

Periodic statements of revenue and operating expenses should be distributed among the employees. There is no surer way of making them feel that they are being given all of the essential facts regarding their company's operations.

On comparatively small systems the problem of disseminating information among the employees is not a difficult one. On the larger systems, however, this task becomes more difficult and complicated. Educational classes, interestingly and intelligently conducted, offer an effective method. These can be supplemented to advantage by bulletins, house organs and other publications. Nothing, however, can take the place of regular, direct contact by responsible officials with the men in the ranks. Unfortunately, it is physically impossible on a large system for the chief operating executive himself to talk directly to all of his men except in large meetings which necessarily take on an element of formality.

Day to day contacts must necessarily be maintained through authorized representatives. To the degree that these supervisory officials down the line reflect the true ideals and objectives of the management, they will be successful in developing that spirit of teamwork which is so essential in the transportation business today. It is upon these channels of human contact within an organization, that management today is chiefly dependent for transmitting not alone the facts of the company's operation, but its ideals as well, to the men in actual contact with the public.

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Alert Management Succeeding Even in Small Communities

ARTICLES and advertisements now inform a sophisticated public that in the United States there are some 3,000,000 "two-car" families. It is safe to assume that a large proportion of these families are located in the smaller cities where backyards are big and parking space downtown is liberal. Yet even in these towns there is ample evidence that public transportation facilities are a necessity.

A case in point is that of the Greenfield & Montague Transportation Area, the progress of which is discussed elsewhere in this issue. Originally this was part of a far-flung cross-country trolley system which had none too many riders even in the pre-automobile era. The automobile took away most of the country business and threw the property into bankruptcy. Under Massachusetts' transportation area act, one fragment of the property was purchased for a little more than scrap value by Greenfield with 16,000 inhabitants and its neighbor, Turner's Falls in Montague Township, with 5,000 inhabitants. There are plenty of automobiles in both places, but the citizens declared by formal ballot that they wanted dependable public transportation too.

One might expect that a system like this would be handled in a humdrum way, for who would really try to make transportation pay in communities of such size when the law permits the bond interest and amortization to be a lien on the general tax funds? Yet the contrary has been the case. The manager believed that you can get more riders on smooth track than on bumpy track; more riders on soft cross-seats than on hard longitudinal benches; more riders with cheery-colored cars than with funereal shades; and more riders with frequent, sensibly-worded appeals for patronage than with glum advertisements about getting a square deal.

The manager not only believed these things himself, but also sold his viewpoint to his trustees and the public. The result was surprising. The Greenfield & Montague Transportation Area today is doing far better than could reasonably have been expected. It may not be making a return on "reproduction cost new." However, if judged from the commercial basis of a merchant who makes a fresh start with a marked-down inventory of his out-of-date stock, this undertaking shows every promise of being rebuilt into a successful business.

Brooklyn Bus Settlement in Sight

PROSPECTS appear to be promising for a new alignment of surface lines in Brooklyn, with bus service co-ordinated. So far as the public announcement indicates, the plan would contemplate the segregation of the surface lines of the Brooklyn-Manhattan Transit Corporation from the rapid transit lines and the operation of these surface lines in conjunction with 82 miles of bus routes of the Equitable Coach Company in Brooklyn and Queens, for which rights have been granted by the city but still subject to approval of the New York Transit Commission as to their convenience and necessity.

It is a matter of speculation whether the lines of the Brooklyn City Railroad will be included, but it would appear more than likely that they will. In any event the territory will undoubtedly be so allocated that there will be no duplication of service. This would leave to the Equitable the franchise rights it has obtained for crosstown lines in the Borough of Manhattan.

The possible modification of the rights of the Equitable is a subject now before Mayor Walker. Pending the result of negotiations with the city by the interests concerned in this latest move, the New York Transit Commission announced that it would suspend all proceedings on the Equitable's plea for certificates of convenience and necessity. The matter of bus rights in New York City has been long drawn out. So far as the borough of the Bronx is concerned the principal bus awards there were made to a subsidiary of the Third Avenue Railway and a service of more than 75 miles of routes is being run in that borough. Now it begins to look probable that the issue in Manhattan, Brooklyn and Queens will be settled on the basis of co-ordination instead of needless competition and duplication. On that basis it could have been settled long ago.

Regulation Essential for Taxicab Stability

RECENT figures quoted in the public press indicate the importance of the taxicab in the field of urban transportation and the need for stabilization of this preferred carrier system by regulation. A. Freed, president of the Paramount Cab Manufacturing Company, estimates that the 20,000 cabs in New York City have an annual income of $160,000,000. He says that for every $1 received by all other public transportation agencies in New York, $1.02 is spent for taxi rides.

Nevertheless, the mortality rate in the taxi business is high. It is reasonable to believe that lack of regulation and independent operation of cabs, resulting in price wars, inferior service to the public, and traffic congestion, are largely responsible for the unsavory record of this business. When cabs are operated in large fleets by organizations properly controlled, each cab is in use from 18 to 24 hours a day, requiring from two to three drivers. Repairs and service are made in the most economical way by mass production methods. Thus major economies in equipment and in maintenance are made possible, to say nothing of the reduction in waste mileage and street congestion that results from an organized and responsible service.

Such operation by individual owners is impossible. As a result, the taxi industry contains a large percentage of owner-drivers who work from twelve to fourteen hours a day, often converting their cabs to semi-jitneys, in an attempt to keep their individual taxi businesses in existence. If such a labor condition existed in any of the so-called capital controlled industries, regulatory legal steps would be taken immediately.

The public should have primary consideration in the operation of any means of public transportation. For this reason public utilities are subjected to regulation. The important place to which the taxicab has grown in the transportation of the general public is indicated by the income figures cited for New York. It is an important utility and, when unregulated, degenerates through unrestricted competition both within itself and with other transportation organizations which are under public control. Why then should not taxicabs be under supervision comparable to that exercised over other utilities? Regulation would benefit the cab industry through stabilization. It would lead to co-ordination in operation that would reduce traffic congestion. It would surely tend to make it possible for each cab to earn its justified income, give better service and bring working conditions for cab drivers to a par with that of other industries.

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Cars of the Greenfield & Montague Transportation Area operate over this bridge across the Connecticut River

Continued Improvement

Shown at Greenfield

Rehabilitation, new de luxe cars and merchandising methods have brought a substantial increase in the net earnings of the operating company

CONCLUSIVE evidence of the need for public transportation systems in small communities is furnished by the experience of the Greenfield & Montague Transportation Area during the past four years. Located in the middle valley of the Connecticut River, these Massachusetts towns are in rather hilly country, which gave them a relatively high riding habit in the old days. Conditions are different now because the skilled mechanics who make up most of the wage-earners have long been owners and operators of automobiles. The only way for the electric railway to appeal to them is with modern service at attractive fares. That this has been done successfully is shown by the fact that the railway revenue for the past two years has averaged more than 10 per cent above the figures that were reached in 1925.

This undertaking dates from the transportation area act of 1920. Under this act, one or more communities may unite to establish a "transportation area" under that specific title, when the property can be bought "on the basis of actual value at the time of appraisal and not on the cost of replacement."

Origin of the Transportation Area

Following the mandate of a general election on May 24, 1924, the two towns of Greenfield and Turner's Falls in the township of Montague, paid the receiver of the Connecticut Valley Street Railway $62,000 for 8.7 miles of track with cars and repair facilities. Operation began on Aug. 1, 1924, under a board of four trustees, two from each town, who appointed Frederick A. Persons to be superintendent-manager. Although publicly owned, the Transportation Area is subject to the regulation of the State Department of Public Utilities with regard to fares, extensions, expenditures for new cars and so forth. The funds for the original purchase came through an

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issue of ten-year serial bonds, of which $70,000 were issued by Greenfield and $31,000 by Montague. Since the purchase price was $62,000, the undertaking began with a working capital of $39,000.

The transportation area act permits deficits to be made up out of taxes. Luckily, it has not been necessary to take advantage of this provision. Depreciation is figured on the basis of not less than 3 per cent and not more than 5 per cent of the book value. The higher figure is used in this instance because of the low investment.

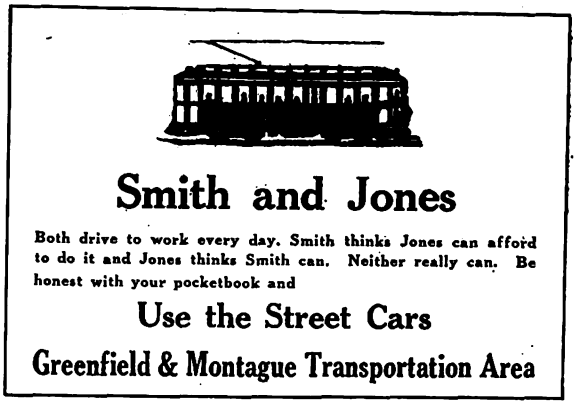
Alternative Bus Operation Abolished

The period of the World War, 1914-1918, was one of tremendous activity in the Greenfield-Turner's Falls district because of the demand for precision tools, shell-making machinery and other war supplies. As elsewhere, these conditions were accompanied by an influx of jitneys. It was not until 1918 that Massachusetts passed legislation permitting electric railways to run buses; and it was 1919 before the Connecticut Valley Street Railway was running them between Greenfield and Turner's Falls, a distance of 3.14 miles by highway but 4.8 miles by railway. These buses were operated on the basis of cutting the railway service in two, giving a combined headway of 30 minutes. The same fare was charged on the buses as on the cars.

When the Transportation Area took over the property its management could not see the utility of running two classes of service. It was concluded that all-rail service on the 30-minute headway was the most economical and the one that would get most out of the investment. The question of greater safety on grades in winter-time was also a factor in the decision to stick exclusively to the rail.

Track and Car Rehabilitation Begun at Once

The property taken over was not far from the status of junk. Extensive rehabilitation was necessary. For example, a total of 9,192 ties have been replaced. On the basis of 2-ft. spacing, this corresponds to 3½ miles of the 8½ miles operated. The bridge over the Connecticut River has been completely repaired, repainted and its timber deck and rails completely replaced. Hundreds of dished joints were welded and ground smooth; much special work replaced; the overhead wiring repaired; and a new roof put on the carhouse. Moreover, all of the rolling stock was painted an attractive combination of chrome yellow and cream. Two of the six-passenger cars were fitted with automobile cushion cross seats in place of side seats.



Type of newspaper advertisement used to sell electric railway transportation in Greenfield

The rehabilitation carried out during the fall of 1924 and the season of 1925 was charged in part to capital account and in part to maintenance of way. The work done during 1926 and 1927 was charged entirely to maintenance account. In all, about $30,000 was expended on rehabilitation up to the end of 1927, over and above ordinary maintenance charges.

Nor was rehabilitation all that the management undertook. Encouraged by a 25 per cent increase in receipts which followed double-truck car operation on Conway Street, Greenfield, in March, 1926, specifications were prepared for two light-weight, semi-steel cars with deep-cushioned, leather-upholstered seats. These cars were delivered in May, 1927.

Ride-Selling Campaign Begun

By Dec. 1, 1925, physical improvement of the property had reached the point where the management felt that ride-selling ideas could be applied. Up to that time there had been no regular newspaper advertising nor changes in fare. The standard rates had remained 10

Corner of Federal and Main Streets, Greenfield, the heart of the transportation system

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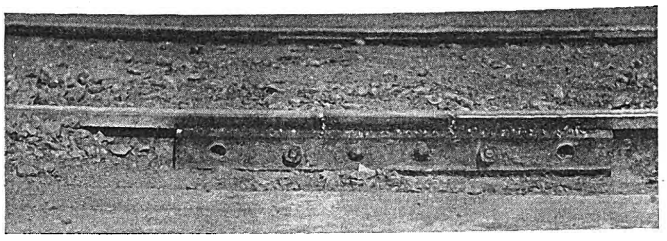


Appearance of rail joint after repairs

cents cash minimum and twelve tokens for 50 cents, but as two tokens were charged for the first two zones or part thereof, the lowest adult rate was 8⅓ cents. Beginning Nov. 30, 1925, two types of unlimited-ride, transferable weekly passes were offered: a $1 pass good in any selected pair of adjacent zones; and a $1.50 pass good within the entire five zones. The pass proved successful despite the fact that most of the buyers could not take advantage of the luncheon period to eat at home; nor could the property offer the short headways and variety of off-peak attractions of larger cities. Nevertheless the first twelve months of 1926 showed a revenue improvement from $79,024 to $86,938, or 10 per cent, as compared with the preceding year.

A Sunday-holiday pass was started on May 1, 1927, and has been retained as an all-year feature. Another new-business idea was the trial of evening passes for the summer, beginning with June 26, 1927. These daily passes and evening passes cost 25 cents as compared with 50 cents a round trip with cash or 43⅓ cents with tokens. Holders of the $1 weekly passes may ride into additional zones on payment of 5 cents cash or a 4⅙-cent token per zone.

Special Causes Bring Temporary Recession of Earnings

Every move that the Transportation Area has made in modernizing the equipment and sales methods of the property indicates that there is a demand for service, regardless of the large use of the private automobile. This was shown in the growth of revenue and riding during 1926 in comparison with 1925, when passenger revenue advanced 10 per cent, and the increase in the number of riders was about 26 per cent!

For the first ten months of 1927, a further improvement was noticed. Then came the great flood of November, 1927, which cost something like $2,500 in receipts, and extra expense in restoring the condition of the property. Nevertheless, with a drop of $1,270 in revenue, total operating expenses were lowered by $4,592. This saving made it possible to apply $5,000 to reserves under "appropriations of surplus" as against $1,600 in 1927 and $1,450 in 1926.

BALANCE SHEET,
GREENFIELD & MONTAGUE TRANSPORTATION AREA

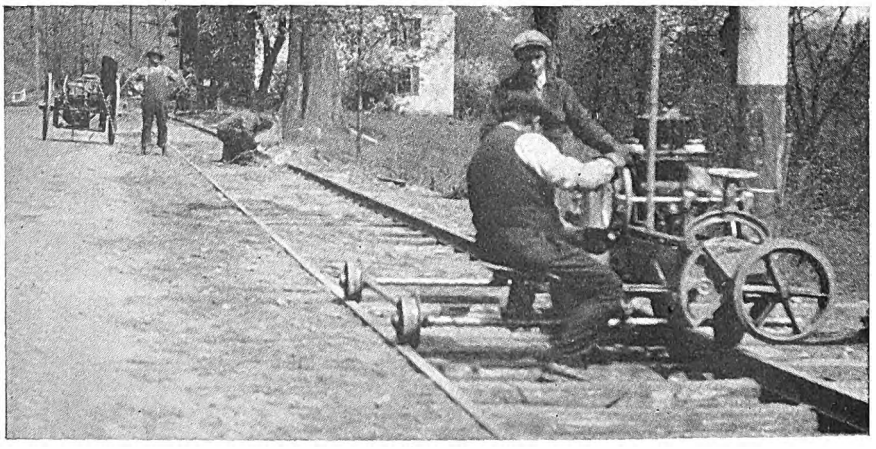
	8/1/24	12/31/24	12/31/25	12/31/26	12/31/27
ASSETS					
Cost of roadway	$22,500	$22,298	$38,944	$38,944	$38,944
Cost of equipment:					
Cars and electrical equipment	17,000	17,300	17,300	18,789	46,034
Miscellaneous tools	.....	1,783	3,606	3,760	3,988
Furniture	.....	524	389	389	389
Cost of land and buildings	22,500	23,151	24,918	24,918	24,918
Total investments	$62,000	$65,058	$85,159	$86,801	$114,275
Cash	38,977	24,153	16,173	23,159	11,478
Miscellaneous accounts receivable	.....	978	1,460	537	571
Material and supplies	.....	6,318	8,872	8,790	10,030
Interest, dividends, rents received	.....	112	245	295	177
Total current assets	$38,977	$31,562	$26,752	$32,782	$22,257
Prepaid insurance and taxes	.....	1,288	1,124	1,303	3,174
Other unadjusted debts	.....	9,885	226	94	.....
Total unadjusted debts	.....	$11,173	$1,351	$1,398	$3,174
Grand total	$100,977	$107,794	$113,262	$120,982	$139,707
LIABILITIES					
Town of Greenfield	$69,977	$69,977	$69,977	$69,977	$69,977
Town of Montague	31,000	31,000	31,000	31,000	31,000
Total capital	$100,977	$100,977	$100,977	$100,977	$100,977
Loans and notes payable	.....	.....	.....	.....	6,700
Accounts and wages payable	.....	2,529	2,407	3,384	2,691
Accrued interest, dividends	.....	963	294	398	252
Total current liabilities	.....	$3,493	$2,702	$3,782	$11,644
Operating reserves	.....	800	699	1,399	2,099
Accrued depreciation—road and equipment	.....	1,303	4,609	9,215	14,139
Other unadjusted credits—tokens	.....	550	1,652	1,315	1,509
Total unadjusted credits	.....	$2,654	$6,961	$11,930	$17,748
Miscellaneous fund reserves	.....	500	2,400	4,000	9,000
Profit and Loss	.....	170	221	292	336
Total corporate surplus	.....	$670	$2,621	$4,292	$9,336
Grand total	$100,977	$107,794	$113,262	$120,982	$139,707

As occurred on many other New England properties, the first quarter of 1928 fell behind because of an unusually mild winter. Another loss was suffered from a change in the movement of Boston & Maine train crews. These crews formerly were good cash customers on the run between East Deerfield yards and Greenfield, but since April 1 most of the train crews run through between Boston and Troy and Mechanicsville, N. Y.

Despite these difficulties, the management is facing the future with confidence. Indications point to better industrial conditions, which will benefit the railway. Since April, 1928, the sale of weekly passes has increased 5 per cent over the same period of 1927. Pass sales, it is believed, are a good index of the trend of employment.

The accompanying tables tell the story clearly.

It should be noted that the division of the route into zones calls for multiple registration of the same rider. While there were 2,281,056 fare registrations for 1927, there were two registrations for each 10-cent cash fare, 8⅓-cent token fare or $1 pass; and three registrations for each 15-cent fare, 12½-cent token fare or $1.50 pass. The actual number of individuals, based on an average of 2.25 registrations per rider, would thus be 1,013,802 or 4.43 per car-mile.



Electric arc welder and electric rail grinder were used in track reconstruction

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COMPARATIVE INCOME STATEMENTS

	1924*	1925	1926	1927
Passenger revenue				
Cash fares	$22,204	$51,404	$50,824	$48,519
Token fares	7,956	23,407	12,766	12,268
School tickets	919	2,588	2,736	2,285
Weekly passes	.....	1,623	20,611	22,209
Sunday and holiday passes	.....	.....	.....	515
	$31,080	$79,024	$86,938	$85,797
Special car revenue	.....	.....	143	21
Mail revenue	176	432	422	422
Express revenue	57	152	412	505
Total revenue from transportation	$31,314	$79,608	$87,916	$86,746
Station and car privileges	133	319	319	319
Rent of buildings and equipment	.....	9	18	55
Miscellaneous	48	539	90	127
Total revenue from other railway operations	$182	$868	$428	$502
Total railway operating revenue	$31,496	$80,477	$88,345	$87,249
Maintenance of way	$4,009	$17,342	$22,621	$16,634
Maintenance of electric lines	450	1,898	886	1,889
Buildings, fixtures and goods	28	146	168	564
Depreciation of way and structures	945	2,341	706	703
Total way and structures	$5,433	$21,728	$24,383	$19,792
Maintenance of cars	2,518	6,486	6,175	4,803
Maintenance of electrical equipment	1,542	3,818	4,746	4,162
Miscellaneous equipment expenses	74	118	154	47
Depreciation of equipment	357	964	3,552	4,575
Total equipment	$4,492	$11,388	$14,628	$13,589
Total power—purchased	6,892	17,481	18,307	17,899
Car operators	6,358	15,123	15,297	15,418
Miscellaneous transportation expenses	1,641	3,890	4,214	4,489
Total conducting transportation	$8,000	$19,013	$19,512	$19,907
Total traffic expenses	.....	275	336	531
General expenses	$2,680	$6,423	$6,500	$6,877
Injuries and damages	828	123	140	591
Insurance	843	1,999	2,019	1,971
Stationery and printing	165	358	445	467
Stores expenses and rents	33	40	.....	53
Total general and miscellaneous	$4,552	$8,946	$9,106	$9,960
Total railway operating expenses	29,371	78,833	86,274	81,681
Net operating revenue	$2,124	$1,643	$2,070	$5,567
Taxes	555	642	597	575
Operating income	$1,569	$1,001	$1,473	$4,992
Income interest	270	794	595	799
Gross income	$1,839	$1,796	$2,068	$5,791
Interest unfunded debt	206	.....	.....	493
Net income	$1,633	$1,796	$2,068	$5,297
Appropriations of surplus				1
Reserves	500	1,450	1,600	5,000
Dividends	963	294	398	252
Total appropriations	$1,463	$1,744	$1,998	$5,252
Net surplus to "profit and loss"	$170	$51	$70	$44

*1924—5 months of operation.

The decrease in way expenses shows that the ideal of a smooth rail is approaching fulfillment; and the decline from 3.7 kw.-hr. to 3.5 kw.-hr. per car-mile with only a half-year's use of lighter cars for part of the mileage demonstrates one of the outstanding advantages of modern equipment.

OPERATING STATISTICS

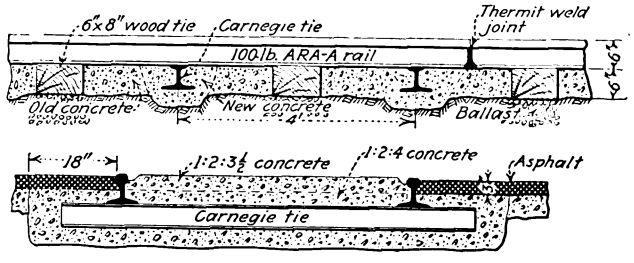
	1924*	1925	1926	1927
Cash fare registrations	444,085	1,028,092	1,016,484	970,393
Token fare registrations	190,962	561,782	306,400	294,435
School ticket registrations	36,770	103,573	109,443	91,426
Weekly and Sunday pass registrations	.....	61,292	810,117	903,756
Transfers	16,386	45,999	26,643	21,046
Total registrations	688,203	1,800,738	2,269,087	2,281,056
Passenger car-miles	94,307	225,800	229,663	228,579
Passenger car-hours	11,319	26,983	27,373	27,476
Operating revenue per car-mile	$0.33397	$0.35641	$0.38467	$0.38170
Operating expenses per car-mile	.31144	.34913	.37565	.35734
Operating revenue per car-hour	$2.78258	$2.98252	$3.22746	$3.17547
Operating expenses per car-hour	2.59490	2.92161	3.15180	2.97283
Alternating-current kilowatt-hours purchased	361,550	947,760	1,022,860	985,800
Direct-current kilowatt-hours converted	300,990	768,400	842,040	793,174
Average efficiency-substation, per cent	83.25	81.09	82.32	80.45
Average cost per alternating-current kilowatt-hour	$0.01906	$0.01844	$0.01789	$0.01815
Ties used	1,610	3,244	2,547	1,791
Average cost	$0.966	$0.866	$0.611	$0.806

*1924—Only 5 months of operation.

Track Reconstructed Using Both Steel and Wood Ties

By A. W. Baumgarten
Division Engineer Chicago & Joliet Electric Railway, Joliet, Ill.

During the summer of 1928, the Chicago & Joliet Electric Railway was confronted with the problem of rebuilding 3,300 ft. of single track. The 60-lb., 6-in. rail was completely worn out and the condition of the paving also was bad. The old standard single-track construction consisted of wood ties on stone ballast, concrete paving base from the bottom of the wood ties to the base of the rail, and grouted brick paving on a sand cushion. Upon examining sections of such track that had been in use for over ten years, it was found that a slight settling of the rail structure had occurred on account of the settling of the stone ballast, thereby causing paving failures in areas where automotive traffic was fairly heavy. From previous experience on double-track construction, it was believed that steel ties in concrete would be a more permanent type of structure.



Cross-section of the type of combined wood and steel tie construction used in relaying 3,300 ft. of track in Joliet, Ill.

However, on single-track lines, this type of construction could not be used without interrupting service unless temporary track was laid. Laying temporary track would have made the cost of the work almost prohibitive. It was decided, therefore, to design a combination of wood tie, steel tie and concrete structure which would permit the work to be done without excessive cost, while still obtaining to a large extent the advantages of the steel tie in concrete. A plan and cross-section of this design is shown herewith. The materials used consisted of 100-lb., A.R.A. type "A" rail with Carnegie type M-26 ties and 6-in. x 8-in. x 7-ft. wood ties spaced alternately on 2-ft. centers.

The procedure of removing the old structure and relaying track and paving was carried on with minimum interruption to service. All of the old brick paving was removed down to the base of the rail at the same time the old concrete was broken away from each side of the alternate wood ties. It so happened on this particular construction that the concrete paving base was in excellent condition and the old wood ties were in fair condition with the exception of being rail-cut. For this reason, it was decided to remove only alternate wood ties to be supplanted by Carnegie steel ties, leaving the old concrete paving base and remaining wood ties on which to surface and line the new 100-lb. rail. Short sections of the old rail were then removed; at the same time old wood ties which had been previously loosened were taken out, new steel ties placed in the old trench and new rail laid in place. In this way, practically no interruptions occurred in service over this track.

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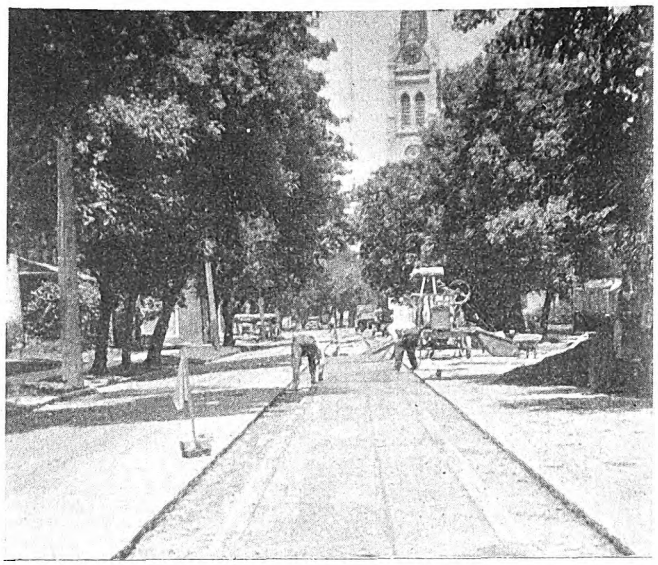


New track as it looked before flange-way forms were removed or outside strips filled with asphalt

The new rail was next surfaced and lined on the old wood ties, using steel and wood shims where necessary, the steel ties also being connected to the rail. After installing several hundred feet of rail section as outlined above, the new rail joints were thermit-welded and ground to surface, leaving the section of track ready for concreting. Concrete was poured monolithic to the surface between rails, using a 1:2:4 mix with a low water content on the base and a 1:2:3½ mix on the top, three inches of paving surface between rails. Because this track was laid in a street with asphalt paving, it was decided not to lay a concrete surface over the 18-in. space outside the rail. Concrete was laid in the 18-in. space only to within three inches of the top of the rail, this strip later being filled with asphalt and thoroughly rolled.

Flange-ways were formed by wiring wood strips to the rails, allowing them to remain in place for about four hours until the concrete had started to set. In finishing the top surface of the paving between the rails, the concrete was thoroughly tamped with a tamping bar but no belting was done, leaving the surface somewhat roughened.

The entire construction was carried on progressively and, with the exception of about ten hours after completing a section of concrete, there were no interruptions to car service over this track. It was felt that no harm would result to the concrete where the rails were firmly supported on the wood ties. In fact, close examination along the rails, after the concrete had set, failed to disclose any movement having taken place between rail and concrete.

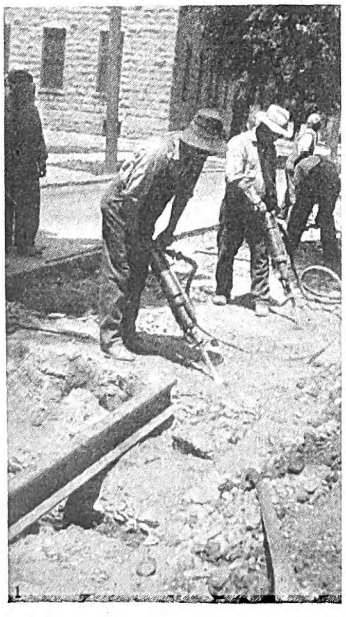
CONSTRUCTION COST OF 3,300-FEET CONCRETE PAVED TRACK

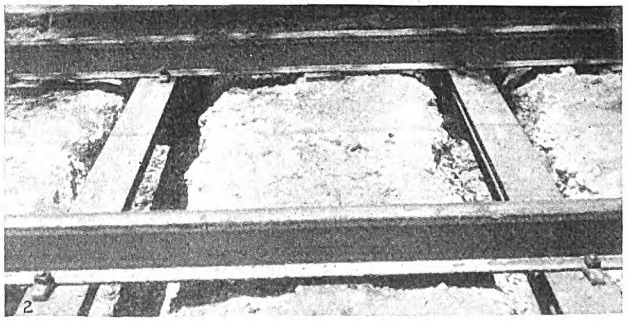
Material	Total Cost	Cost per Foot
Rails—100 lb. ARA	$5,255.00	$1.59
Ties—steel	2,205.00	.67
Cement	2,193.23	.66
Sand and gravel	1,590.74	.48
Joints—thermit-welded	552.00	.17
Asphalt paving	2,782.50	.84
Miscellaneous material	1,062.14	.32
Engineering superintendence, accounting, etc.	2,817.92	.86
Total material	$18,458.53	$5.59
Total labor	6,208.34	1.88
Total cost of new track	$24,666.87	$7.47
Labor removing old track and paving	2,337.00	.71
Total cost of completed job	$27,003.87	$8.18

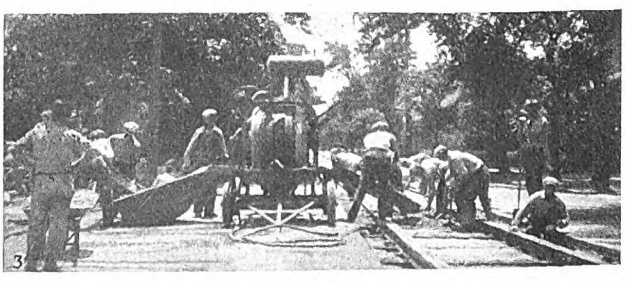
Total Cost $8.18 Per Foot

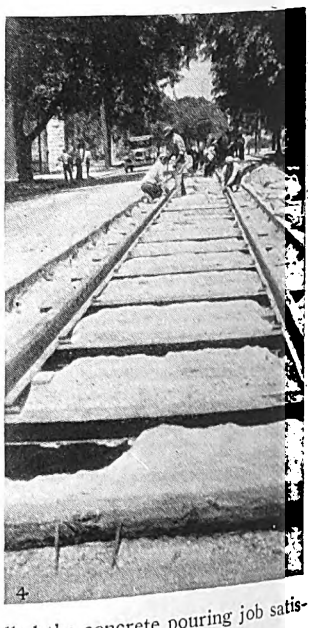
The accompanying table itemizes the cost of this construction, including all charges such as engineering superintendence, accounting, interest on idle investment and trucking expense. In addition, the complete cost of removing old track and paving has been shown separately, making the total cost $8.18 per foot for removal of old track and complete reconstruction with new. The cost is no greater than that of the previous standard type of construction followed, wherein wood ties were used exclusively. At the same time it is considerably less than it would have been had all steel ties been used, involving, as this would, the laying of temporary track.

It was found, although not anticipated, that after the asphalt paving strips were laid adjacent to the rails, the noise of cars passing over this type of monolithic construction was materially reduced.









No. 1—Air hammers were used in removing old rail and alternate wood ties from pavement.

No. 2—New track was surfaced with aid of shims on undisturbed wood ties imbedded in original concrete base.

No. 3—A one-bag mixer handled the concrete pouring job satisfactorily.

No. 4—Retention of alternate wood ties speeded job of lining and surfacing new track.

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Modern Problems of

Motor Coach Design

Demand an Open Mind

The wide discrepancy in performance between motor coaches and automobiles is brought out in this article, which is based upon an address presented before the Metropolitan sections of the A.E.R.A. and S.A.E. The author explains some of the design and manufacturing problems with which the motor coach engineer is confronted—particularly in vehicles for long distance, high-speed service

By G. A. Green
Vice-President in Charge of Engineering
General Motors Truck Corporation

THE amazing growth of the motor coach industry is indicated by the fact that during the year ending December, 1927, motor coaches handled 13.5 per cent of all passengers transported by all forms of common carriers. This development and expansion cannot fail to make one optimistic as regards the future. In order to grasp intelligently the significance of what has actually happened during the five-year period ended December, 1927, it is of interest to compare the relative use of various available means of passenger travel as shown in the following table:

		Per Cent
Population	Increased	8.6
Total common carrier passengers	Increased	9.1
Riding habit	Increased	0.4
Steam road passengers	Decreased, 92,826,473	9.7
Electric railway passengers	Decreased, 400,044,561	0.2
Motor coach passengers	Increased, 1,657,000,000	197.0

These figures speak for themselves. But the motor coach industry is only in its swaddling clothes. Twenty years ago horse-drawn stages were operated for hire on Fifth Avenue and about that time the first motorized equipment appeared there. It would be wrong to say that progress from a design standpoint during this period has been rapid, for it certainly has not and this is unquestionably due to lack of foresight. Neither the manufacturers nor the largest potential buyers, namely, the electric and steam railroads, were at first able to see the possibilities of the motor coach.

Although the general attitude toward motor coaches has now changed considerably, it seems only fair to point out that this wonderful industry has been built up almost entirely as a result of the vision, foresight and courage of the individual operators who until recently received little if any support from the manufacturers or from the steam and electric railroads. Undoubtedly, many will recall the pressure brought to bear upon the manufacturers by the individual operators to produce suitable equipment; also that the manufacturers were for a long time deaf to the operators' pleas. This forced the individual operator to employ converted trucks and modified automobiles. In some instances, in a small way, operators were even forced by circumstances to manufacture their own equipment.

Perhaps, in thus pointing out the comparatively slow progress in coach development and in calling attention to lack of foresight in recognizing its possibilities, I may ruffle the feelings of some of those associated with the industry from its early days. There is, however, no intention of discourtesy. It seems to me that we should face the facts fearlessly, and the facts, as I see them with respect to the motor coach, are that we have much ground to cover before we can boast of our achievements. This is particularly true with respect to developments to meet the conditions imposed by long-distance, high-speed operations.

In all that I may say regarding the problems of coach design, my comments represent only my personal views in the light of present-day experience. These may necessarily be subject to change. I am convinced, however, that motor coach engineers should not be satisfied with present results and my feeling is that they should leave no stone unturned in the effort to convince their managements of the necessity of expending substantial sums on research and development.

Coach Design Demands an Open Mind

Considering now specific questions of design, there is room for much difference of opinion as to the possibilities of various ideas that have been advanced. But the proper point of view for the engineer is admirably conveyed by that famous slogan whose author is, I think, responsible more than any other man for the amazing achievements and world leadership of the American automobile industry; namely, "An Open Mind." And it is with an open mind that we should approach such design questions as: (1) larger engines; (2) oil cooling; (3) use of superchargers; (4) improvement, or better still, elimination of the transmission; (5) gas-electric drive; (6) steam propulsion; (7) six-wheel system.

At the present time there is a clearly-defined demand for at least three general motor coach types with a number of different body styles, the so-called street car and

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parlor car bodies being fitted to any of the chassis. Very briefly, these chassis types are:

1. A small vehicle particularly suited for school and hotel services. Both automobile and truck chassis with relatively minor changes are generally employed and the design needs no particular comment. Such vehicles accommodate from 8 to 16 passengers and the average automobile power plant provides satisfactory performance.

2. Motor coaches for medium duty services, seating from 17 to 25 passengers. There is a growing demand for this class but the demand has been slowed down by unsatisfactory design. On the whole, coaches of this type have been a disappointment to the user. The power plants were too small and the general construction too light. The maintenance costs have been high. These conditions are changing, however, and satisfactory chassis are now available.

3. Heavy-duty coaches seating from 25 to 40 passengers. This class in the smaller seating capacities is in general use for urban and interurban services, including long-distance coast-to-coast day and night runs. The 40-seat capacity type is a somewhat recent development which has aroused a very considerable interest.

Long Distance Operations Present Greatest Problems

For urban operation the present types appear to give fairly satisfactory results, although in the larger units added power would be welcome. But in interurban service, particularly the long-distance high-speed runs, available vehicles are underpowered. Briefly, such vehicles do not meet with public approval since they lack that which the public desires most; namely, automobile performance with respect to speed and acceleration. These comments are intended as general and should not be applied to any specific type. It is obvious that more than one size of power plant is required. The very large power output so necessary for heavy-duty parlor car coaches for long-distance service would, in the majority of cases, be unsuitable if used elsewhere. Smaller engines may be employed for urban service because a lower gear ratio can be used.

Today, practically everybody recognizes that all highway vehicles for passenger transport are in the automobile class. The motor coach and the automobile employ the same highway and the public is demanding that motor coaches from the standpoint of safety, comfort, appearance, speed, acceleration and deceleration, compare favorably with the average automobile as now built. Unfortunately, however, the difficulties in the way of meeting this standard of motor coach performance are many and varied. There are wide differences in the type and character of the various services to be met, including speeds, loads, road surfaces, grades, etc. This means that unless a vehicle is specifically designed to meet the needs of a specific kind of service, compromises, mechanically speaking, are inevitable.

It is evident that the manufacturers hold widely divergent views as regards mechanical fundamentals. For example, the purchaser is offered power plants of varying types possessing in total from four to twelve cylinders. He may also acquire single- or dual-drive installations for both gear and gas-electric; and before very long, steam may become a factor. The net result is a certain kind of confusion on the part of the buyer. In a general way, we know that there is a vast difference between automobile and motor coach performance, which is to be expected in view of the fact that the so-called heavy-duty motor coach engines as now commonly used displace only from 450 to 500 cu.in.

Coach Performance Far Below Automobile

To be specific, let us compare the actual high gear acceleration values (of this year's automobiles and motor coaches) under laden conditions in terms of miles per hour per second at from 10 to 35 m.p.h. Average high gear acceleration value for the automobile is 2.262; the maximum 2.53. The corresponding motor coach figures, considering both urban and interurban equipment of various seating capacities, are 0.5 and 1.25 respectively, with a full seated load. It should be mentioned that 1¼ m.p.h.p.s. is an unusually good performance as judged by present standards. To the best of my knowledge there is only one motor coach which will meet this figure, and that is the Yellow model W parlor car. Here, however, in round figures there is a 100-hp. engine for a 17-passenger vehicle, the unladen weight of which is in the neighborhood of 10,000 lb. Briefly, it is clear that automobile acceleration rates are from two to five times the best obtainable performance of motor coaches.

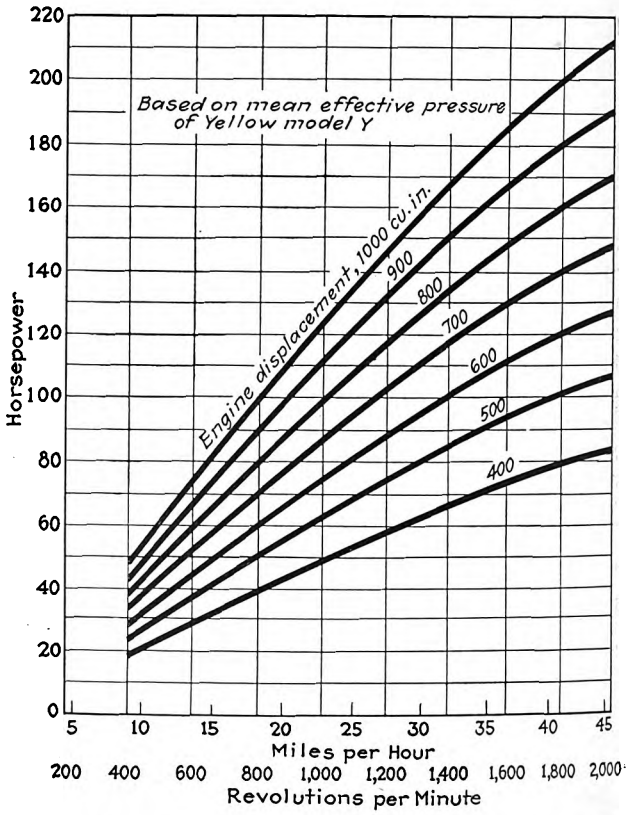

Fig. 1—Horsepower output for engines from 400 cu.in. to 1,000 cu.in. displacement, assuming no change in efficiency resulting from the increase in engine size. Calculations are based on mean effective pressure of Yellow model Y

In order to present clearly the nature of the motor coach performance that can be expected as a result of the employment of engines of widely varying displacements, the accompanying graphs have been prepared, showing horsepower output of engines displacing from 400 to 1,000 cu.in., the corresponding torque, respective acceleration and hill climbing ability, respective hill climbing distances, and respective acceleration values.

In the preparation of these charts certain assumptions.

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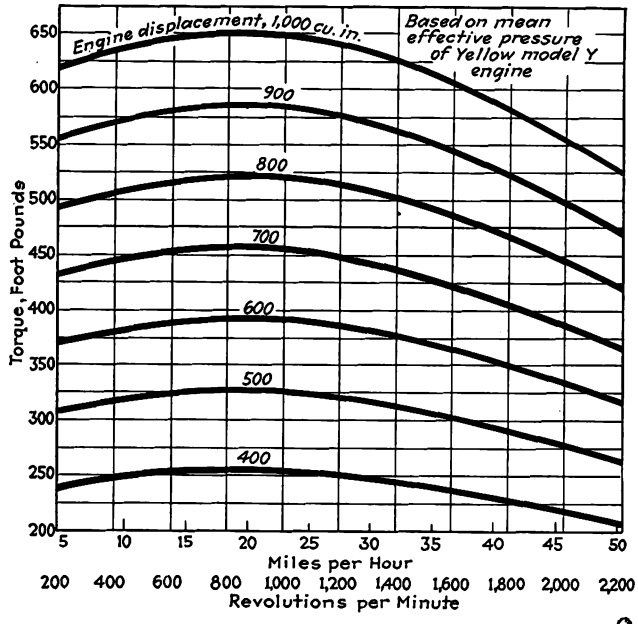

Fig. 2—Torque output per engine for engines from 400 cu.in. to 1,000 cu.in. displacement assuming no change in efficiency resulting from the increase in engine size

were made with respect to rear axle ratio, tire size, wind resistance, rolling resistance, efficiency and weight. The mean effective pressures of the Yellow model Y were used in arriving at the horsepower and torque figures. The data can be considered as applying specifically to interurban high-speed equipment. The weight, 19,250 lb., is not abnormal since it includes a full complement of both passengers and baggage. It should be noted that the calculations assume no change in the efficiency of the power plant or drive mechanism resulting from increased engine size; a uniform vehicle weight, irrespective of engine displacement; and the same relative power consumption for all accessories.

In the accompanying Fig. 1 the engine revolutions per minute, miles per hour and horsepower are shown for engines from 400 cu.in. to 1,000 cu.in. displacement. It will be seen that the maximum power output is available at 2,000 r.p.m., which is equivalent to a road speed of 46 m.p.h. The 400-cu.in. engine produces a maximum of 82.5 and the 1,000 cu.in. 212 hp.

In Fig. 2 are shown the engine revolutions per minute, miles per hour and torque, for engines from 400 cu.in. to 1,000 cu.in. displacement. The maximum torque is

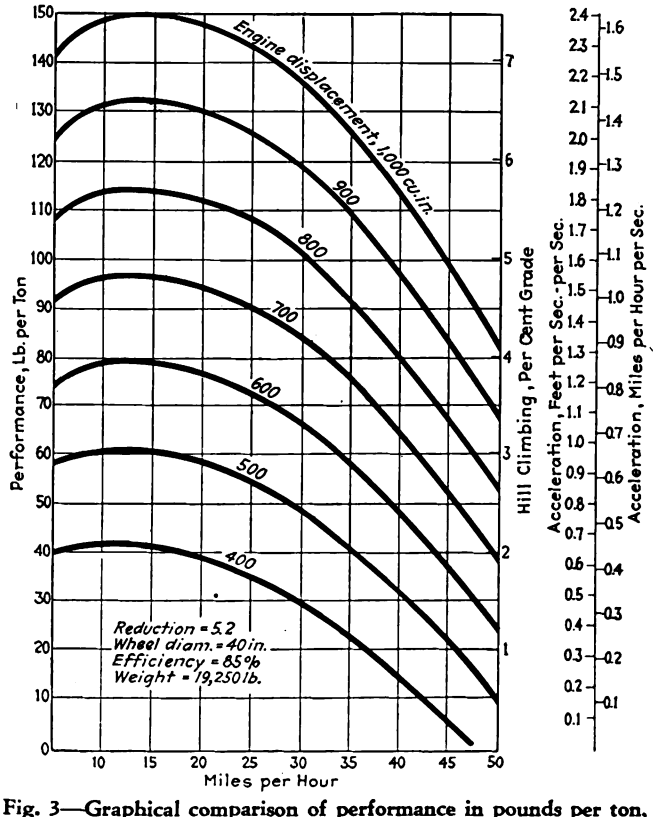

Fig. 3—Graphical comparison of performance in pounds per ton, acceleration, and hill climbing ability in high gear for engines from 400 cu.in. to 1,000 cu.in. displacement. Vehicle weight is assumed to be 19,250 lb. and to remain constant for all engine sizes

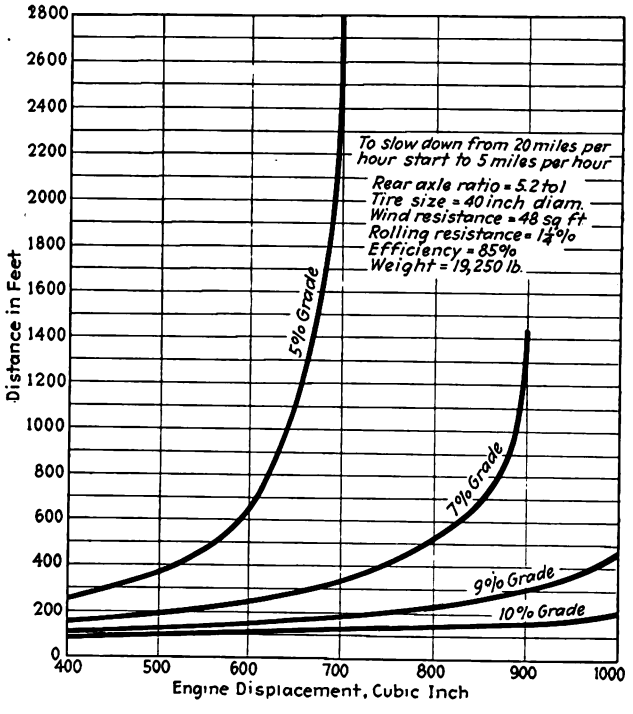

Fig. 4—Hill climbing distances in high gear on grades of 5 per cent, 7 per cent, 9 per cent and 11 per cent for engines from 400 cu.in. to 1,000 cu.in. displacement, assuming constant vehicle weight of 19,250 lb. and constant engine efficiency. The calculations are based upon approaching the grades at 20 m.p.h. vehicle speed

available at 800 r.p.m., which is equivalent to a road speed of 18 m.p.h. The curves are fairly flat between 400 and 1,400 r.p.m. With the 400-cu.in. engine the maximum torque is 256 ft.-lb. With the 1,000-cu.in. engine the corresponding figure is 650 ft.-lb.

1,000-Cu.In. Engine Accelerates 1.63 M.P.H.P.S.

Fig. 3 shows the performance in pounds per ton, acceleration in feet per second and in miles per hour per second, and hill climbing ability on grades of from 2 per cent to 7 per cent, for engines from 400 cu.in. to 1,000 cu.in. displacement. The assumed weight of the vehicle is 19,250 lb. It is interesting to note that the maximum acceleration value with a 1,000-cu.in. engine is 1.63 m.p.h.p.s. and that this is effective at a road speed of 15 m.p.h. It will be seen that a 400-cu.in. engine will climb a 2 per cent grade and that a 7½ per cent grade can be negotiated with a 1,000 cu.in. engine. The

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DIMENSIONAL RESTRICTIONS STATE MOTOR VEHICLE LAWS

Maximum Length		Maximum Width		Maximum Height	
28 ft.....	2 states	84 in.....	1 state	12 ft.....	4 states
30 ft.....	9 states	90 in.....	7 states	12 ft. 2 in.....	1 state
33 ft.....	6 states	92 in.....	1 state	12 ft. 6 in.....	12 states
35 ft.....	2 states	93 in.....	1 state	14 ft. 6 in.....	6 states
40 ft.....	3 states	96 in.....	31 states	No restrictions.	26 states
No restrictions.	27 states	102 in.....	1 state		
		No restrictions.	7 states		

curves in Fig. 4 are based on approaching the bottom of the hill at a speed of 20 m.p.h., and show the distances on grades of 5 per cent, 7 per cent, 9 per cent and 11 per cent that can be climbed by engines from 400 to 1,000-cu.in. displacement. The vehicles are considered as having stalled when a speed of 5 m.p.h. has been reached. It is interesting to note that engines of the following displacements are required in order to climb these grades: 5 per cent, 700 cu.in.; 7 per cent, 900 cu.in.; 9 per cent, 1,182 cu.in.; 11 per cent, 1,406 cu.in. Actually a 1,000-cu.in. engine will stall on a 9 per cent grade after reaching 450 ft. and on an 11 per cent grade after having reached 200 ft. It was previously stated that these calculations are all based on high gear performance. Of course, in actual practice stalling would not take place since the operator would shift gears before this occurred.

1,425-Cu.In. Engine to Duplicate Automobile Acceleration

The graphs in Fig. 5 show acceleration values in miles per hour per second and feet per second per second from 10 to 25 and 10 to 35 m.p.h. These curves are of special interest since they permit a ready comparison to be made between the relative acceleration abilities of the automobile and motor coach. It was previously shown that under laden conditions the average 1928 automobile acceleration rate from 10 to 35 m.p.h. is 2.262; the maximum 2.53. Now to duplicate this condition with a motor coach having the characteristics as outlined in the graphs would require engines displacing 1,425 and 1,605 cu.in. respectively. Such engines would be capable of delivering, respectively, about 302 and 340 hp. These are theoretical figures. In actual practice considerably more power would be needed than these figures indicate, and it is obvious that excessive engine sizes would be required to approximate automobile performance.

Consider for a moment some of the practical problems involved in producing heavy-duty motor coach engines. In the first place, the designing and development, including samples, tests, patterns, tools, jigs and fixtures, would require an expenditure of at least $500,000 to produce what might be termed a heavy-duty engine. This expenditure is based on limited tooling to provide for around 2,000 units annually. It is possible to employ heavy-duty motor coach engines modified in various respects for marine purposes, rail cars, tractors and the like, but this kind of business is highly specialized and with the exception of the tractor no great volume is in sight. Unfortunately, with the tractor, first cost is an all-important issue and this practically rules out the possible use of the motor coach engine. Producton possibilities are therefore very limited.

Large Engines Introduce Complications

With larger engines the tire mileage cost will be greater. Larger tires will be needed to carry properly the additional weight of both engine and chassis. Then, also, more rapid acceleration means increased tire wear. Obviously the larger the tire the more difficult the steering. Furthermore, tire diameter increases adversely affect the turning radius.

A larger engine will project further into the body with a resultant decrease in passenger capacity. This may be partially offset by permitting the engine to project behind the dash but there is a limit to what can be done in this respect. With the existing so-called heavy-duty engines an average parlor car, the over-all length of which is held within 30 ft., cannot accommodate more than 29 passengers with any reasonable degree of comfort. Assuming an engine of 700 cu.in. capacity or greater, and even taking into account the maximum permissible projection

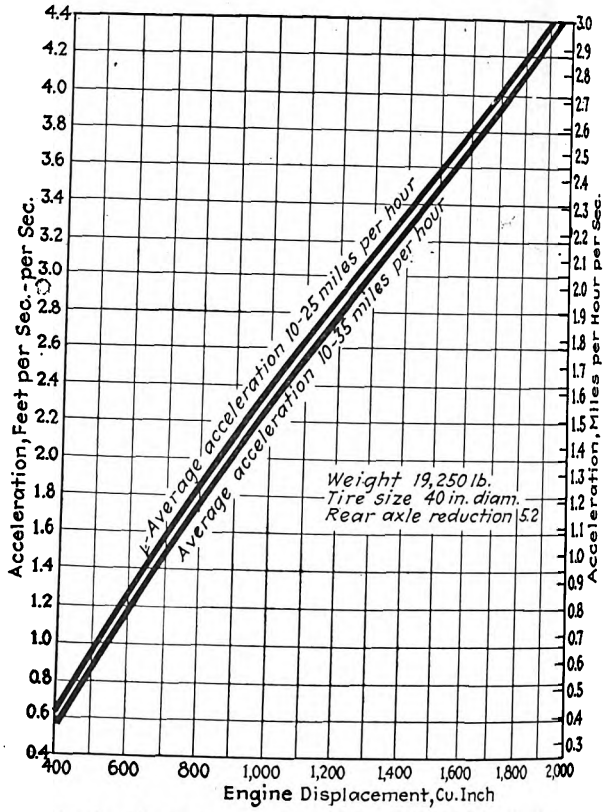

Fig. 5—Acceleration values for various engine displacements assuming constant vehicle weight. Average 1928 automobile acceleration rate from 10 to 35 m.p.h. is 2.262 and the maximum 2.53

behind the dash, in all probability the seating capacity would be automatically reduced to 25 passengers unless, of course, the over-all coach length is arbitrarily increased, which would rule out this type of equipment from 11 important states.

Further Complications Are Presented by Larger Engines

The drive mechanism must be strengthened throughout, which means the enlargement of the clutch, transmission, propeller shaft and final drive. Naturally, considerable additional weight will result. In effect, a very large engine will necessitate what practically amounts to a new chassis, with resultant designing, testing, tooling and development expenditures of possibly another $500,000.

Larger engines present a cooling problem as well. With a single engine installation the frame determines the width of the radiator; the driver's vision and ground clearances determine the height dimension; thermal conditions, the thickness of the core; the power losses determine the amount of air that can be drawn through the core. At present with some designs as much as 10 per cent of the available engine output is at times used to

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drive the fan. As an average, probably from 2½ to 5 per cent of the power output is so employed constantly. This is a factor of considerable importance, particularly when one considers that a corresponding percentage of the total fuel bill is involved.

There is, of course, the alternative of providing two engines, but there are a number of difficulties; for example, seat arrangement, cooling, prevention of heat and odors entering body, accessibility, and last but not least, added upkeep cost resulting from the dual drive system. It should also be pointed out that where two engines are employed the cooling problems are as great, if not greater than, with the single unit, and a point not to be lost sight of is that two relatively large engines will be needed and the difficulties to be encountered resulting from their projection both above and below the frame line cannot be discounted.

With any very large increase in engine displacement a greater average fuel consumption is to be expected, but the extent of the increase will depend largely upon the character of the operation and the skill of the operator. Naturally there is a loss in efficiency when very large engines are operated at part throttle. If it were possible to considerably increase the engine output without adding weight to the engine or other chassis parts the situation would be less serious, but unfortunately this cannot be accomplished.

Automobile Performance Improbable

Despite all of the design problems presented, however, there is a persistent demand for larger engines. One point stands out with unmistakable clarity; namely, it is highly improbable that the performance of an internal combustion engined motor coach can ever be expected to parallel that of the average automobile. But it is also obvious that engines must be made available which will permit of sustained high vehicle speeds. There are many services where sustained speeds in excess of 60 m.p.h. are absolutely safe. But such engines should be capable of giving reliable service of this kind day after day, year after year, with only the absolute minimum of attention. Vehicles in this type of service will regularly cover from 75,000 to 100,000 miles annually and, assuming proper design, practically no attention should be required other than periodic examinations and cleaning. It is needless to stress the reliability factor, particularly in connection with long-distance operation. Such vehicles frequently do not return to their respective divisions for weeks at a time, and when one considers the immense annual mileage, it will readily be seen that the actual time available for inspection and repairs is, as a rule, quite limited. Of course, failures of any kind are to be deplored, but the results of a failure of a motor coach on a long-distance run are of immeasurably greater consequence than in city service.

Six-cylinder engines in excess of 500 cu.in. displacement cannot be expected to give economical service if turned over for very long periods in excess of 2,000 r.p.m. Furthermore, the size and weight of six-cylinder engines becomes out of all proportion where a very large power output is required. It seems reasonably clear that engines displacing beyond 600 or 700 cu.in. should be of the V type, not the least of the advantages being the question of space occupancy. Generally speaking, with large engines the length factor is determined by the bearings and not by the cylinder bores. For this reason, among others, a square engine should be considered, and since for a 1,000 cu.in. engine a six would require 6x6-bore and stroke, an eight 5½x5½, and a twelve 4¾x4¾, the evidence points to the largest number of cylinders; namely, twelve. Unless supercharging becomes a factor in increasing coach engine power, it seems quite evident that future heavy-duty parlor car engines will displace from 900 to 1,000 cu.in.

Other Possible Improvements Require Study

Superchargers—Concerning the possibility of supercharging, it is unquestionably a matter deserving of the closest possible scrutiny. Many passenger car engineers disregard this issue altogether, preferring the popular annual reaming process for increasing engine output. Of course, this is the easiest way out but there is a limit to the possible size of motor coach engine cylinders, and engines in excess of 700 cu.in. represent a tremendous mass of metal, take up a lot of room and cost a lot of money to buy and to maintain. Tests made to date indicate that supercharging is within the realms of possibility. The best scheme appears to be the high-pressure type blower of large size operated at relatively low speeds. Unfortunately, however, there is little or no likelihood of developing superchargers that may be attached to existing engines for the engine and supercharger design must be worked out jointly.

Transmission—Transmission design has changed very little since the first automobile was built—a rather discouraging state of affairs—and no matter how one may reflect on the situation, it is little short of amazing that such a barbarous piece of mechanism exists in this day and age. The problem of gear shifting, of course, is still with us, but the question of noise is the vital issue. There is no such thing as a quiet transmission, silence being merely a relative term.

Everyone appreciates the amazing developments that have taken place with regard to automobile design. Unfortunately, however, but a very small percentage of the brains employed on this work have been devoted to the transmission question. The weaknesses are recognized, but in automobile design the only remedy found to date is the enlargement of the engine. Hence the customary annual reaming operations on engine bores. Actually, automobile engines have now reached such proportions that transmissions can be considered as auxiliary devices, their use being primarily devoted to the business of reversing the motion of the vehicle. But a different condition is faced with the motor coach, for no matter how we enlarge the engines, still the transmission will be required to perform a considerable amount of service and the higher torque which must be transmitted through our future transmissions will increase rather than decrease our difficulties.

Manufacturers Not Asleep

Gas-Electric Drive—From these remarks it should not be concluded that manufacturers are entirely asleep at the switch. Experiments are constantly being made with various forms of variable gearing. Then there are, of course, the possibilities of electricity and, last but not least, steam. It is considered by some that the gas-electric will be the final solution. Perhaps this is so, but the present electrical systems are heavy and expensive. The approximate weight of single or dual gasoline-electric equipment for use in connection with an engine developing around 100 hp. is from 1,900 to 2,100 lb., and the cost is in the neighborhood of $1 per pound. These figures speak for themselves.

It is generally recognized that the characteristics of the

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average motor coach engine are not suited to the electrical equipment now available, and it has been suggested that the motor coach industry should produce entirely special engines, but the enormous development cost is prohibitive. Briefly, the average motor coach manufacturer is reluctant to place himself unqualifiedly behind the gas-electric drive because he is not sure that the electrical manufacturers will move with the times. Mention should be made of the fact that the gas-electrically propelled motor coaches as now built by the various American manufacturers are, generally speaking, mechanically sound, the only real objections being high fuel consumption, weight and cost.

Steam Offers Possibilities

Steam Propulsion—It is somewhat surprising that steam has not played a more prominent part in the motor coach industry. Perhaps here again the chief reason is that only a very limited percentage of the total available brains has been engaged upon the solution of the various difficulties. At first sight steam is the ideal solution, but little or no success has attended the various developments which from time to time appear. Nearly all steam-propelled vehicles give a spectacular performance, yet none of them have satisfactorily withstood the acid test of time and distance, but this does not mean that steam is out of the picture. In fact, future developments along this line are assured. How successful they will be it is hard to foretell. But the tremendous advantages, such as maximum torque at zero speed and absolute silence, are irresistibly attractive. However, steam as a factor in the motor coach industry is still far distant and in all probability the tremendous advantages have corresponding disadvantages—at least this has been the history of the past.

Oil Cooling—The following potential advantages are offered by oil cooling: Easier starting, since lighter oils may be employed; less oil consumption, since the viscosity may be kept more nearly constant; less cost because more miles per gallon can be expected from relatively lower priced oils; less wear due to better lubrication throughout, as a result of the ability to maintain a higher average viscosity; longer bearing life due to the decreased tendency of the babbitt to soften as a result of heat; less carbon formation resulting from the use of lighter oils having a lower carbon content.

The modern high-speed interurban motor coach is required to operate for very long periods with the engine delivering a large percentage of its total power output. This condition introduces a number of complications, particularly with respect to lubrication. As a result of the accumulated heat, many of the oils commonly used tend rapidly to decrease their viscosity, in some instances to such an extent that the oil film is no longer capable of supporting the pressure imposed upon it.

With practically all aircraft engines provision is made for oil cooling. It would be difficult, if not impossible, to run these engines successfully otherwise, and the operating conditions of motor coach and aircraft engines are in some respects comparable, since high duty for continuous periods is one of the controlling issues in both cases. From the standpoint of decreasing operating expenses generally, in so far as the engine is concerned, the influence of oil cooling cannot be over-estimated.

Six-Wheel System—That this system is going to play an important part in the future development of the heavy-duty motor coach there is little doubt. This statement is made bearing in mind the unsatisfactory service received from the earlier American models. There has been much loose talk concerning the six-wheel system with respect to tire economy, riding properties and roadway damage. With present six-wheel designs there is considerable doubt in my mind if economy exists with respect to tires, and in so far as riding properties are concerned it can be readily demonstrated that just as good, if not better, results are obtainable with the conventional system. *But the advantages* are clearly in favor of the six-wheel system as regards possible roadway damage, and it is more than probable that the six-wheel system can be made to ride better than the conventional arrangement and can be made to give better tire mileage. Furthermore, there is another point; namely, that with the six-wheel principle properly executed, so-called mass transportation equipment, whether used in urban or interurban service, can be designed with a relatively short wheelbase without excessive rear or front overhang. The importance of this cannot be over-emphasized.

You may say that all of this is poor sales argument for present standard coaches. I don't think so, my feeling being that the average operator will be glad to know that manufacturers do not think that they know it all. I think operators will also be glad to know that manufacturers are continually experimenting with new devices of one kind or another. Then the fact that someone has sufficient courage openly to face the definite trend in public opinion toward motor coaches with automobile performance and to show in a general way some of the difficulties of attainment, should be welcomed.

No Radical Changes Imminent

To allay the fears of operators who have purchased or are about to purchase equipment, as regards the possible proximity of major motor coach design changes and new developments I should like to say that such fears are, to the best of my knowledge and belief, groundless. In short, we are not on the eve of startling events. It is, of course, evident that the more important manufacturers are carrying out experimental and developmental projects of one kind or another, but manufacturers have learned from experience that it is wise to make haste slowly, otherwise service costs soon absorb profits and dissatisfied customers mean an immediate and permanent loss of business.

Public Service Buses Carry Foreign Visitors on Long Trip

EIGHT buses of Public Service Co-ordinated Transport covered 2,500 miles each in a single chartered trip during October. The group carried consisted of some 200 members of the automobile club of Germany, who came to this country to study the methods of automobile manufacture. The trip began on Oct. 10 from the Hotel Pennsylvania, New York, and night stops were made at Philadelphia, Washington, Uniontown, Pa., Columbus, Cincinnati, Indianapolis, Chicago, Detroit, Hamilton, Niagara Falls, and Binghamton. With an average mileage per bus of 2,500, the total miles run were 20,000. The total consumption of gasoline was 3,350 gal., and 158½ gal. of oil were used.

The only delay during the entire trip was a broken ring gear on one of the buses between South Bend and Detroit, but the passengers were transferred to another bus, and the one disabled was soon repaired and in its customary place in the line-up the following morning.

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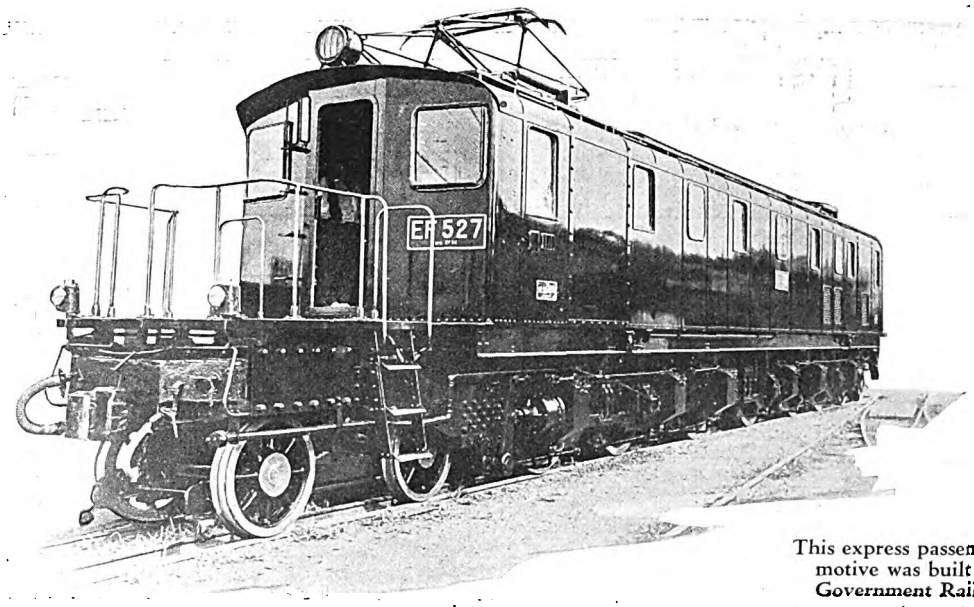

This express passenger electric locomotive was built in Japan for the Government Railways

New Express Passenger Electric Locomotives in Japan

Recent equipment for the Japanese Government Railways includes seven 1,800-hp. high-speed passenger locomotives, built in Japan. Details are given of one supplied by the Kawasaki Dockyard Company, Ltd.

PRESENT plans of the Japanese Government Railways for the main line electrification of sections in the heavy grades and tunnels are quite comprehensive. Much of this work is in the neighborhood of Tokio. Seven high-speed electric locomotives built in Japan have lately been added to the equipment and will be used in express passenger service on the line from Tokio to Kosu, about 100 miles. The accompanying illustrations show a locomotive built by the Kawasaki Dockyard Company, which, with three other large electrical manufacturers in Japan, supplied the equipment mentioned.

The locomotive is of the articulated truck type with six main driving axles arranged for gear drive, with a small guiding four-wheel truck at each end. The principal dimensions, weight, etc., of the locomotive are shown in the accompanying table. The specification relating to starting provides that the locomotive should start from rest a train weighing from 500 to 700 metric tons on a rising grade of 1 per cent and should attain a speed of 50 km. (31 miles) per hour on 1,350 volts.

DATA OF LOCOMOTIVE BUILT FOR TOKIO-KOSU LINE

Truck gage	1,067 mm. or 3 ft. 6 in.
Total length over buffers	20,800 mm. or 68 ft. 3¼ in.
Rigid wheelbase	4,400 mm. or 14 ft. 5 in.
Driving wheel diameter	1,250 mm. or 4 ft. 1¼ in.
Leading wheel diameter	940 mm. or 3 ft. 1 in.
Over-all width over platform	2,810 mm. or 9 ft. 2¼ in.
Hourly rating	1,350 kw.
Speed at hourly rating	45 km.p.h. or 28.1 m.p.h.
Normal maximum running speed	90 km.p.h. or 56.2 m.p.h.
Total weight of locomotive	106 metric tons or 233,200 lb.
Supply voltage	1,500 volt d.c.

The mechanical and electrical parts follow the standards of the Japanese Government Railways. On each of the six main driving axles is mounted an axle-hung geared motor. To provide smooth transmission of the torque between the pinion and gear, the latter is of the spring gear type. The motor frame is of cast steel. Forced ventilation is furnished by two motor-driven blowers, the air being passed not only over the armature and the field coils but also through ducts in the armature cores. The average supply voltage is 1,350 volts, and as there are always at least two armatures in series, there is normally a maximum of 675 volts across any armature. The control system is arranged to give series connection with six armatures in series, series parallel with two parallel groups of three in series, and parallel with three parallel groups of two in series. Resistance steps are provided in each motor grouping, there being twelve series notches, eight notches with three motors in series and eight notches with two motors in series, thus insuring even acceleration. In addition, two weak-field notches are provided for speeding up the motors. The main grid resistors are designed so that their maximum temperature rise will not exceed 250 deg. C.

The control system is of the electro-pneumatic type, the line switches, resistance switches and combination

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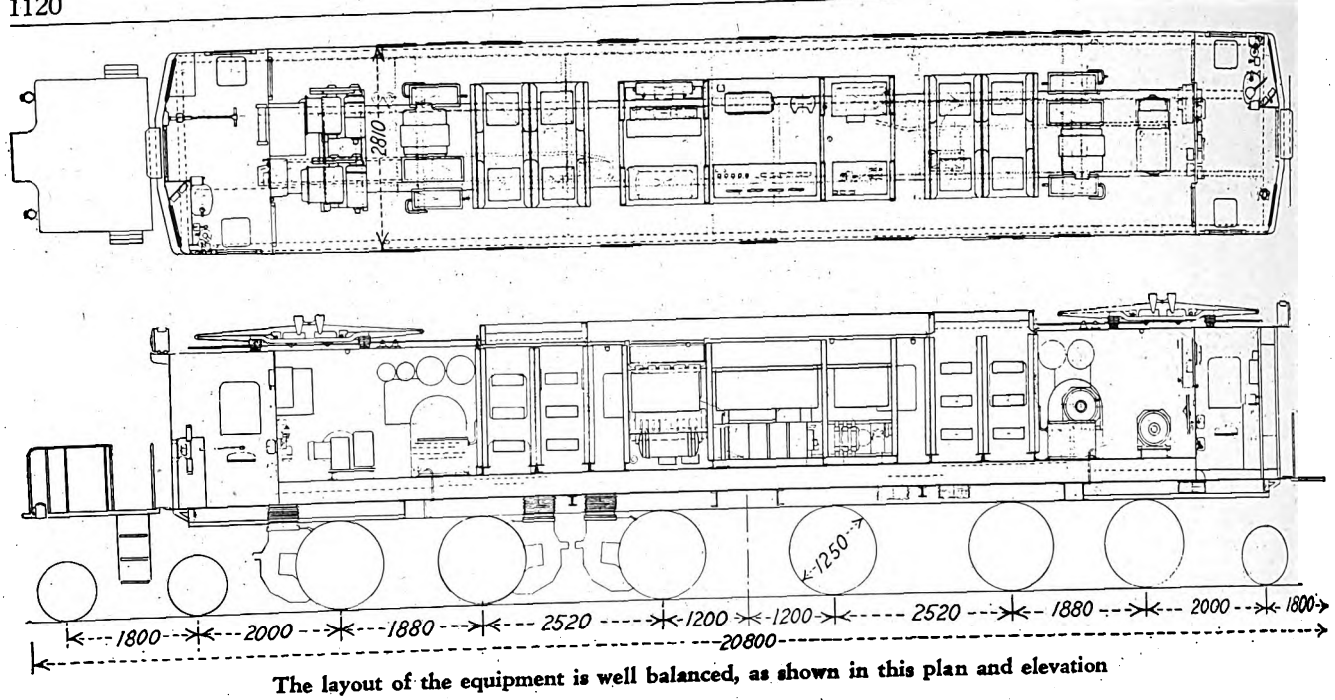


The layout of the equipment is well balanced, as shown in this plan and elevation

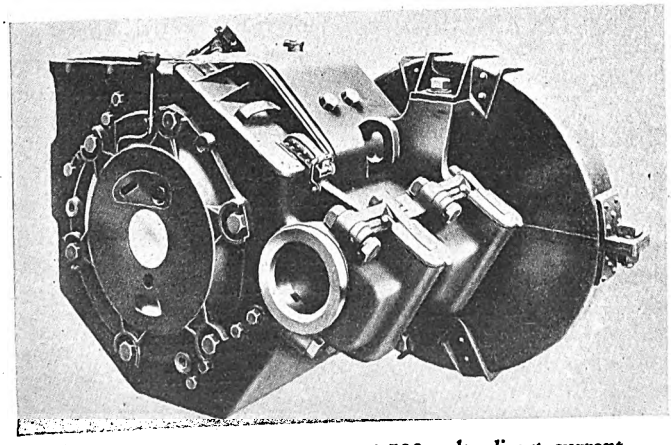
switches consisting of compressed air-operated contactors. The reversing switches are of the drum type, also air operated. All air valves on these switches are operated electrically from a 100-volt supply, obtained by a 1,500/100-volt, 2-kw. motor generator. This motor generator is designed to give a constant voltage irrespective of the supply voltage.

The valve operating circuits are controlled from the master controllers, one of which is mounted at each end of the locomotive. The controllers are fitted with two handles, one for reversing and the other for grouping motors, resistance and field control. A motorman's cab is provided at each end of the locomotive body, the motorman's seat being located on the left-hand side of each cab.

The train is fitted with vacuum brakes, but the locomotive itself is separately equipped with air brakes of the Westinghouse 14-EL type. Accordingly, the equipment includes an air compressor and a vacuum pump, both electrically driven, the latter for operating the train brakes and the compressor for operating the locomotive air brakes. This duplicate arrangement will continue only until all trains can be equipped with air brakes, according to the present plans of the Government Railway Department.

The general arrangement of the locomotive equipment is shown in the plan and elevation. The arrangement adopted gives great accessibility of auxiliary motors and control gears, combined with a uniform distribution of the weight throughout the locomotive. Two through corridors, one along each side of the locomotive, connect the two motorman's compartments. These corridors facilitate inspection of the auxiliary machines and switch gears.

The control portion of the locomotive is in the high-tension switch-gear compartment. There are two auxiliary machine compartments next to the motorman's cab, each separated from the high-tension compartments by a grid resistor compartment. Suitable battery groups are provided in the auxiliary machine compartment to act as a spare of the motor-generator. Change over is effected by a switch on the auxiliary circuit switch panel. The auxiliary circuit includes a control circuit and a lamp circuit, and its nominal voltage is 100 volts. Overload protection is provided by a G-E type high-speed circuit-breaker. There is a choke coil in connection with each pantograph circuit, and an aluminum-type arrester insures protection from lightning and surges. The test run of the locomotive was very successful.



The main traction motors use 1,500 volts direct current

Evansville Freight Shipments Increase

FREIGHT shipments by the traction line route in and out of Evansville, Ind., are showing a steady increase in volume, particularly on the line between Evansville and Owensboro, Ky., according to G. R. Millican, general manager of the Evansville & Ohio Valley Railway. Jobbers and merchants are availing themselves of this service. Through shipments from Evansville to Owensboro are now offered twice a day. The traction car leaving Evansville in the morning insures delivery of freight in Owensboro the same afternoon, while freight leaving Evansville by traction at night is delivered early the morning following.

Both the Evansville & Ohio Valley line and the Evansville, Suburban & Newburgh line, are hauling a great deal of coal at the present time, there being a large number of coal mines scattered along these routes. Many southern Indiana mines now are operating on full time.

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New National

Bus Regulatory Measure

Full text of bill introduced by Representative Parker to replace law proposed last year. New measure believed to overcome previous objections

ANOTHER attempt is to be made at this session of Congress to bring about a degree of order in the regulation of interstate buses by bringing them under regulation. To that end a new bill has been introduced by Representative Parker, as noted in the JOURNAL for Dec. 22, page 1097. The effort made in the present bill is to overcome the objections made to the one lost in the last session largely because of the objection that the measure as it then stood, while it provided for regulation, might tend to hamper the free development of the bus and truck industry. Under the new bill certificates of convenience and necessity are necessary for interstate bus lines, for which applications must be filed with the Interstate Commerce Commission. The so-called grandfather clause will date from Nov. 1, 1928. To go into a lengthy analysis of the provisions of the measure, however, is not necessary since the bill in full is presented herewith.

A Bill

To regulate interstate commerce by motor vehicles operating as common carriers of persons on the public highways

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

DEFINITIONS

Section 1. (a) The term "corporation" shall include a corporation, company, association, or joint-stock association.

(b) The term "person" shall include an individual, firm, or co-partnership.

(c) The term "Board" means the commission, board, or official (by whatever name designated in the laws of a state) which, under the laws of any state in which any part of the service in interstate commerce regulated by this act is to be performed, has or may hereafter have jurisdiction to grant or approve certificates of public convenience and necessity or other form of permit to motor vehicle common carriers in intrastate commerce over the public highways of such state; or, if there be no such authority in the State, then as to that state it means the commission, board, or official which such state may hereafter create or designate.

(d) The term "commission" means the Interstate Commerce Commission.

(e) The term "certificate" means a certificate of public convenience and necessity authorized to be issued under the provisions of this act.

(f) The term "public highway" shall include the public roads, highways, streets, and ways in any state, or any political subdivision thereof or in the District of Columbia.

(g) The term "motor vehicle" includes all vehicles or machines propelled by any power other than muscular power and used upon the public highways for the transportation of persons, except that the same shall not include any vehicle, locomotive, or car operated on a rail or rails, or motor vehicles used exclusively in the transportation of property.

(h) The term "motor carrier" shall mean and include any carrier of persons which holds out, announces, or advertises the operation of motor vehicles for compensation in interstate commerce, or which operates or runs motor vehicles over any street, highway, or public place in interstate commerce, and accepts and discharges such persons as may offer themselves for transportation, either at a terminus or points along the way or route on which such motor vehicles are used or operated or may be running. Nothing in this act shall be construed to include buses employed solely in transporting school children and teachers, or taxicabs having a capacity of six passengers or less not operated on a regular route, or buses owned or operated by or on behalf of hotels and used exclusively for hotel patrons.

(i) The term "chartered motor vehicle" means a motor vehicle hired for a specific trip or trips which is subject to the direction of the person hiring the same.

(j) The term "state" includes the several states and the District of Columbia.

ADMINISTRATION OF THE ACT

Section 2. (a) It shall be the duty of the commission and of joint boards to be created hereunder acting as federal agencies to administer the provisions of this act. All powers heretofore granted in the Interstate Commerce Act to said commission are hereby extended to it for the purpose of the enforcement of this act and it may adopt uniform rules for the regulation of motor carriers and such rules and regulations as may be necessary for the proper administration or enforcement of this act. Any member of a joint board may administer oaths in a proceeding before such joint board. The general rules governing the time and place of meetings of joint boards and the procedure to be used by them shall be promulgated by the commission after a conference with the state boards.

(b) For the purposes of administration of this act, nothing contained in Section 500 of the Transportation Act, 1920, shall be construed by any joint board, by the commission, or by any court to express a policy of Congress in favor of any other form of transportation as against transportation by motor vehicle or to affect in any manner the issue of a certificate under this act, if the issue of such certificate, after all pertinent facts and circumstances have been duly considered on their merits, is deemed proper in the public interest; and nothing herein contained shall be construed as a declaration by Congress of the relative importance to the public of the several kinds of transportation.

(c) For the purpose of carrying out the provisions of this act the commission shall refer all matters over which it has jurisdiction hereunder (except the rules and regulations it may adopt pursuant to paragraph (a) of this section; the regulations provided in sections 6 (b), 7, 8 and 9; the issuance of certificates to bona fide operators in operation on Nov. 1, 1928, without hearing as provided for in section 3 hereof) to joint boards made up, in each case, of representatives of the boards of the several states in which any part of the interstate operation is, or is proposed to be, conducted. On such joint boards there shall be one representative from each of such states, and such representative shall be designated by the board in such state, either from its own membership or staff, or from the membership or staff of a board interested in the proceedings, as such board may elect. If there be no such board in any state or if the board in any state or states shall fail to designate such representative, the joint board shall function without a representative from such state or states and if the said boards of all such interested

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states shall fail to designate representatives the commission shall hear and determine such matter.

(d) The joint board so constituted shall render a decision on matters submitted to it. Such decisions shall thereupon be filed with the commission and all parties to the record notified thereof. The commission in not less than ten or more than thirty days after the filing of a decision by a joint board and notice thereof to interested parties shall issue an order or a certificate in accordance with the decision of the joint board. If a party to the record shall file with the commission notice of an intent to appeal from such decision within ten days after notice thereof such order or certificate shall not be issued until time for appeal from decision of joint board has expired.

(e) The joint board shall keep a record of its proceedings, which shall be filed with the commission. If the joint board is unable to reach a decision within 60 days from the submission of the matter by the parties, unless the time shall be extended by the commission, the commission shall decide the matter upon the record of such proceedings.

(f) If a joint board to which any matter is referred for decision shall fail to start hearing the same within sixty days from its reference, unless the time shall be extended by the commission, such matter shall be heard and decided by the commission.

Certificate of Public Convenience and Necessity

Section 3. No corporation or person shall engage as a motor carrier in interstate commerce on any public highway in any state without having first obtained from the commission a certificate of public convenience and necessity authorizing such operation: *Provided,* That motor carriers in operation on the date of the approval of this act shall have 90 days from such date in which to file application for certificates hereunder and shall have the right to continue in operation until their applications have been finally decided: *Provided further,* That if a motor carrier, or its predecessors in interest, was in bona fide operation over any route on Nov. 1, 1928, and (except as to seasonal service or interruptions of operation over which the applicant or a predecessor in interest had no control) continuously has been so operating since that date and such motor carrier shall make application to the commission for a certificate of public convenience and necessity, it shall be served by the commission with a questionnaire in respect to the matters which, in the judgment of the commission, shall constitute bona fides of operation, which questionnaire the applicant shall answer within 90 days from the receipt thereof; and if it appears from the answers to such questionnaire or from information furnished by any board that the operations of such applicant are bona fide for the purpose of furnishing transportation to the public and of continuing the same for a reasonable period, a certificate shall be issued to such applicant as a matter of course; but if, from the answers to such questionnaire or from information furnished by a board, the commission shall not be satisfied of such bona fides it shall refer such matter to a joint board for decision. A copy of all questionnaires and the answers thereto shall be furnished by the commission to the board of every state in which any part of the service is conducted.

Applications

Section 4. Any corporation or person desiring such certificate shall make application therefor in writing to the commission, which application shall be verified under oath and be in such form and contain such information as the commission by order shall require.

Hearing on Application

Section 5. (a) Hearings on applications of motor carriers in operation on the date of the approval of this act shall be given precedence over hearings on other applications.

(b) In determining whether or not a certificate should be issued, the joint board and the commission shall, among other pertinent matters, give reasonable consideration to the convenience of and necessity to the public to be served thereby of the service by motor vehicle applied for and to existing available transportation agencies and service.

Certificate

Section 6. (a) The joint boards or the commission in deciding the matter of a certificate may authorize the operation proposed, in whole or in part, and may attach to the exercise of the rights granted thereby such reasonable terms, conditions, and regulations as in their judgment the public interest may require, and shall specify the route or routes over which, and the fixed termini, if any, between which the motor carrier is authorized to operate.

(b) Any motor carrier holding a certificate under this act may operate chartered motor vehicles in interstate commerce or may occasionally depart from its regular route for the purpose of providing special service to a point beyond such route, subject to police regulations and according to such rules and regulations as the commission may prescribe.

(c) Certificates issued under this act shall be effective from the date thereof, and shall continue in effect until suspended or revoked. Upon complaint of any board filed with the commission the certificate of a motor carrier may be suspended or revoked, in whole or in part, after hearing by a joint board, for failure to comply with this law or any lawful orders or rules promulgated hereunder.

(d) No certificate issued to a person shall expire solely by reason of death, but a personal representative may operate under such certificate, to the same extent and subject to the same conditions as such decedent could if living.

Transfer Certificates

Section 7. Certificates may be transferred, and the commission shall approve the transfer thereof, subject to the provisions of this act, upon compliance by the transferee with such general rules and regulations as the commission may prescribe respecting such transfers.

Security for the Protection of the Public

Section 8. No certificate shall be issued or remain in force unless the holder thereof shall comply with such rules and regulations of the commission as it shall adopt governing the filing of bonds, policies of insurance or such security or agreement in such form and adequate amount and conditioned as the commission may require for the payment of any final judgment which may be rendered against any such motor carrier arising out of the death of or injury to any passenger or injury to other persons or property as a result of any negligent operation of the motor vehicles of such motor carrier, with power in the commission to permit self-insurance whenever, in its opinion, the financial ability of the motor carrier warrants.

Rates

Section 9. (a) All rates, fares, and charges of motor carriers shall be stated in money, and shall be just and reasonable. Tariffs shall be prepared, filed, and posted in such manner as may be prescribed by the commission.

(b) No motor carrier shall charge or demand or collect or receive a greater or less or different compensation for such transportation of persons, or for any service in connection therewith, between the points named in such tariffs, than the rates, fares, or charges which are specified in the tariffs in effect at the time; nor shall any such motor carrier refund or remit in any manner or by any device any portion of the rates, fares, or charges so specified, nor extend to any person any privileges or facilities for the transportation of persons except such as are specified in such tariffs: *Provided, however,* That any motor carrier authorized to operate under the provisions of this act may issue or give interstate free tickets, free passes, and free or reduced transportation to persons engaged in the service of the carrier.

(c) No change shall be made in any such rate, fare, or charge which shall have been filed and posted in compliance with paragraph (a) of this section except after 30 days notice of the proposed change filed and posted in like manner, which notice shall plainly state the change proposed to be made and the time when the change will take effect: *Provided,* That the commission may, in its discretion and for good cause shown, allow changes upon less than the notice herein specified or modify the requirements of this section in respect to posting and filing of tariffs, either in particular instances or by a general order applicable to special or peculiar circumstances or conditions.

Appeals

Section 10. Any party to the record in any matter submitted to a joint board may appeal within thirty days after receiving notice of the filing of the decision of such joint board to the commission from the decision rendered.

The commission shall decide such appeal on the record made before such joint board and may affirm the decision of such joint board or may set the same aside or modify the same or order a rehearing of the matter or make such other order as the public interest may require.

The commission may stay the issuance of an order putting into effect the decision of a joint board during the pendency of an appeal.

Any order entered by the commission which constitutes a final order under the provisions of this act shall be subject to the same right of relief in court by any party in interest as is now provided for in respect to orders of the commission in the act to regulate commerce approved Feb. 4, 1887, as amended.

Orders and Notices

Section 11. (a) It shall be the duty of every motor carrier as defined in this act to file with the board of every state in which it operates, and with the commission, designation in writing of the name and post office address of a person or corporation upon which person or corporation service of notices or orders may be made on such motor carrier. Such designation may from time to time be changed by like writing similarly filed. Service of notices or orders may be made upon a motor carrier by personal service or by mail on the person or corporation so designated by it at the address filed, or by personal service on such person or corporation. In default of such designation, service of any notice or order may be made by posting in the office of the secretary or clerk of the board of the state wherein the motor carrier maintains head-

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quarters and in the office of the commission.

(b) Notice of every decision of a joint board, or of an order or certificate of the commission entered after hearing affecting any motor carrier shall be given to all parties to the record in the proceedings, either by personal service or registered mail.

Unlawful Operation

Section 12. (a) Upon conviction in any federal court having jurisdiction any person or corporation who shall have operated a motor vehicle of any character in willful violation of the provisions of this act, either in his own interest or as the agent of another or shall have otherwise willfully violated any provision of this act, or any lawful order of the commission, shall be fined not more than $100 for the first offense and for any subsequent offense shall be fined not more than $500. Each day of violation of a provision of this act shall constitute a separate offense.

(b) If any motor carrier shall operate in violation of the provisions of this act, or shall fail or neglect to obey any lawful order of the commission, the commission, or any party injured, may apply to any court of competent jurisdiction in any district where such motor carrier is engaged in business for the enforcement of this act or such order; and the court shall have jurisdiction to enforce obedience thereto by a writ of injunction or other proper process, mandatory or otherwise, and to restrain such carrier, its officers, agents, employees, or representatives from further violation of this act or of such order, or to enjoin upon it or them obedience to the same.

Appropriations for Contingent Fund

Section 13. There is hereby authorized to be appropriated out of the Treasury of the United States such sums as may be necessary, to be paid to the commission and held by it as a separate contingent fund, out of which it may meet such expenses of the administration of this act as are incurred by it or by the joint boards.

Powers of the States

Section 14. Nothing in this act contained shall be construed to affect the powers of taxation of the several states or to authorize a motor carrier to do an intrastate business on the highways of any state. It is not intended hereby to interfere with the exclusive exercise by each state of the power of regulation of motor carriers on the highways thereof engaged in intrastate commerce; and, notwithstanding this act, motor carriers operating in intrastate commerce on the highways of a state shall continue to be subject to the laws thereof and motor carriers engaged in interstate commerce hereunder shall be subject to the proper exercise by the state of its police powers.

The commission while acting under authority of this act shall not have any jurisdiction or authority over intrastate commerce by motor carriers and the commission is expressly prohibited from interfering in any way with or attempting to regulate such intrastate commerce by motor carriers.

Section 15. Any corporation or person which shall engage in the transportation of passengers by motor vehicle upon the public highways, or which shall own and control a motor carrier which operates such motor vehicles, or which shall purchase and own the whole or any part of the capital stock of a corporation organized or engaged as a motor carrier in the transportation of passengers by motor vehicle upon the public highways in interstate commerce, and for the operation of which motor vehicles a certificate of public convenience and necessity has been obtained as in this act provided, shall be, and it is hereby, relieved from the operation of the "anti-trust laws," as designated in section 1 of the act entitled "An act to supplement existing laws against unlawful restraints and monopolies, and for other purposes," approved Oct. 15, 1914, and of all other restraints or prohibitions by any law, state or federal, in so far as may be necessary to enable it to own, control, and operate, either directly or through a subsidiary corporation, such motor vehicles upon the public highways for the transportation of persons, property, or mail.

Section 16. Nothing in this act shall prevent Congress from repealing, amending or modifying this act, or any privilege or right granted thereunder.

Constitutionality

Section 17. If any provision of this act shall be held unconstitutional, either as respects all motor carriers or as respects any motor carrier or class of motor carriers, such invalidity shall not be held to affect any other provision thereof.

Exhibit Shows Work of Commission

UTILITIES serving Grand Rapids, Mich., are regulated by a city commission, a body which has accomplished much for both the utility group and the city. To portray the work of the utilities department of the commission, an exhibit was prepared and displayed in the City Hall. The Grand Rapids Railroad, the Consumers Power Company, the Michigan Bell Telephone Company and the Grand Rapids Gas Light Company are the four utilities whose activities are portrayed on the exhibit. The portion devoted to the Grand Rapids Railroad has a duplicate of the Charles A. Coffin award certificate, replicas of the gold medal which accompanied the certif-

Exhibit in the City Hall of Grand Rapids picturing the activities of the city's four utilities. The upper left-hand quarter is devoted to the Grand Rapids Railroad

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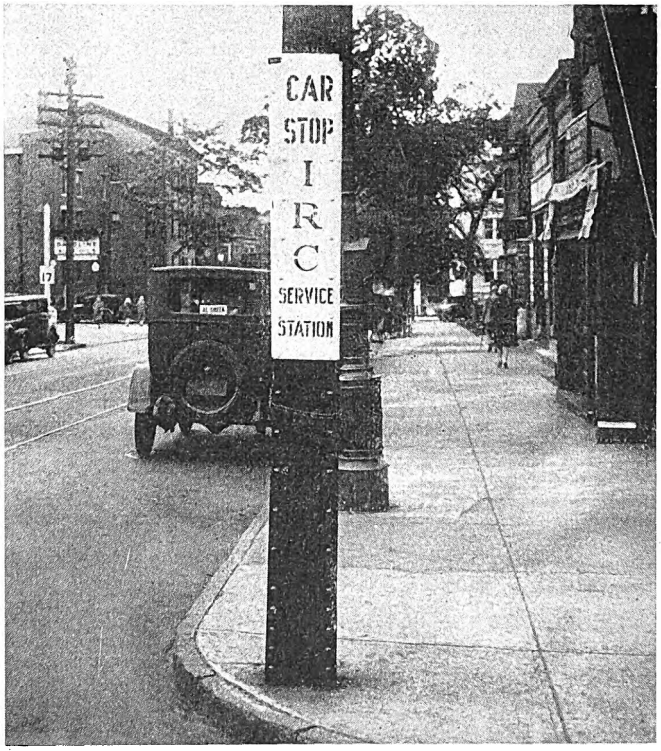
icate and numerous photographs and charts depicting the company's progress. Much favorable comment on the exhibit has been received from the thousands who have viewed it.

The utilities department is headed by Gerald J. Wagner, consulting engineer.

Buffalo Tries New Car Stop Signs

AT THE suggestion of one of its employees, the International Railway, Buffalo, N. Y., is experimenting with a new method of marking car stops. The company at present follows the conventional practice of painting a white band around the nearest pole, carrying the words "car stop" written perpendicularly in 4-in. letters.



I.R.C. acts on suggestion of one of its trainmen in making up new car stop sign

Recently a trainman suggested that, inasmuch as each car stop is actually a street car service station for the public, this thought be incorporated in the wording of the signs. In line with this suggestion the railway company has repainted one of the poles on Main Street in Buffalo as shown in the accompanying picture. Thus far the only comments heard have been of a favorable nature and consideration is being given to the advisability of similarly marking each of the company's 1973 car stops in the cities of Buffalo, Niagara Falls and Lockport.

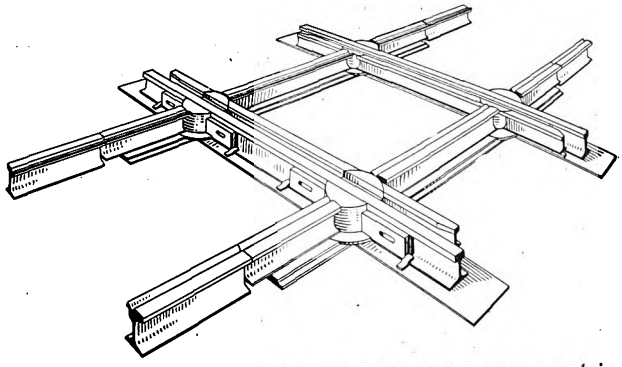
Chicago Terminal Joins Three Systems

ESTABLISHMENT of the downtown Chicago terminal of the Chicago, Aurora & Elgin Railroad at Quincy and Wells Street as an inbound "Loop" station for the trains of the Chicago, North Shore & Milwaukee Railroad was announced recently by R. S. Amis, general passenger agent of the North Shore Line. Heretofore, persons traveling to Chicago from North Shore Line points have had no inbound station facilities in the downtown business district. The Northshore Line station at 223 South Wabash Avenue is the main Chicago "Loop" station for all outbound stations.

The Wells Street terminal is directly connected by an overhead bridge with the Quincy-Wells Street station platform of the Chicago Rapid Transit Lines, which is a regular stop for all southbound North South Line trains. With its spacious waiting room and restaurant facilities, the terminal is a convenient central location where persons arriving in Chicago over the North Shore Line may be met. The terminal also affords direct connection with trains of the Chicago, Aurora & Elgin Railroad, operating to western suburbs.

Experience with Flange-Bearing Crossing Over Steam Road Rails

EXPERIMENTS extending over a period of several years have been made by the San Antonio Public Service Company, with electric railway over steam crossings of the type shown in an accompanying illustration. The object at first was to eliminate the severe impact caused by steam railroad trains passing over the flangeways cut out of the railway rails. First crossings of this



Flange-bearing crossing made at San Antonio with a new design of light construction

type were installed in 1921. In 1926 another type of flange-bearing crossing was designed, in which two steel castings were used, one for the gage, the other for the side opposite the gage, both of which acted as points of contact for the crossing with the steam railroad rails. A description of this was published in ELECTRIC RAILWAY JOURNAL for Dec. 27, 1927.

It was decided to incorporate in this design, flange-bearing rail the entire length of the street car part, so that, regardless of the depth of the flanges, cars would pass over in the same plane, causing no impact except over the spaces left to accommodate the steam railroad flanges. Four of this type of crossing were installed in the fall of 1927 and four additional such crossings have just been completed. They use L. S. Section 98-451 rail instead of the 7-in., 150-lb. flange-bearing rail for the street car part of the crossings. This design calls for a fill in the groove to within $\frac{1}{2}$ in. of the top of the rail, thus making a lighter construction but retaining at the same time the good features of the heavier crossing.

The steam railroad rails in this type of crossing are not deformed in any way but are held in line by tie clips which are a part of the framework of the crossing, leaving the steam rails free to move longitudinally.

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Practical Ideas *for the* Maintenance Man

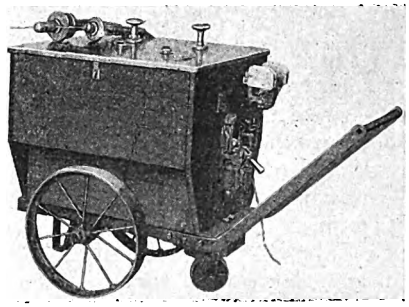
Insulation Tests for Traction Apparatus

By G. L. Moses

Renewal Parts Engineer Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

USE of suitable insulation test voltage in repair shops will reduce the number of pull-ins as it is a satisfactory guarantee of the sufficiency of the insulation. The cost of equipment and additional labor to make such a test is slight, as compared with the saving, because of the reduction in road failures and improvements to the service. Such testing equipment, therefore, pays big dividends. Any insulation test is meaningless unless a sufficiently high test voltage is used to show up the potential faults. For this reason the standard insulation test voltage for traction apparatus, as recommended by the American Institute of Electrical Engineers, has been set sufficiently high to provide a satisfactory factor of safety. The standard test for control apparatus used on voltages of 600 and over is 2¼ times normal voltage plus 2,000 volts, and for motors is two times normal voltage plus 2,000 volts. Assembled apparatus, where a number of individual units are connected, may be tested at 15 per cent lower voltage. The test voltage should be applied continuously for one minute. Alternating current is recommended for making insulation tests.

Equipment which has been overhauled should be in a condition comparable with the original. All dust, dirt and grease should be removed; burnt and cracked insulation replaced; and all the insulating parts painted with an insulating varnish or dipped and baked. After this is done the equipment should be given the same insulation test as is given new equipment. The test voltages recommended for such apparatus are given in Table I. When equipment is only partially overhauled, such as if a motor has the armature rewound and the field coils are not rewound, the completely overhauled parts should be given this test and the remainder may be tested at the depreciated test voltage in Table II.



Type of high-voltage test equipment used in many electric railway shops

At each inspection period the dust and dirt should be removed from the insulation and faulty parts replaced. Grease should be removed from the insulation with benzine or gasoline. Parts which show signs of burning should be scraped clean and painted with an insulating varnish. After the work is completed, an insulation test of 70 per cent of the standard test voltage for new equipment should be applied. The test voltages for this class of apparatus are given in Table II.

TABLE I—INSULATION TEST VOLTAGES COMPILED FROM AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS' STANDARDS TO BE USED FOR APPARATUS WHICH HAS BEEN OVERHAULED THOROUGHLY

Line operating voltage	600	1,200	1,500	3,000
Main circuits to ground control (control app.)	3,350	4,700	5,380	8,750
Between main circuit leads with switches open	3,350	4,700	5,380	8,750
Motor leads to ground	3,200	4,400	5,000	8,000
Control circuits to ground	2,000	2,500	2,500	2,500
Between control circuit fingers and contacts that are open in operating position	500	500	500	500

For line voltages not listed standard A.I.E.E. test voltage applies.

TABLE II—SUGGESTED VOLTAGES FOR TESTING APPARATUS WHICH HAS BEEN IN SERVICE, AFTER IT HAS BEEN INSPECTED, CLEANED AND THE NECESSARY REPAIRS MADE

Line operating voltage	600	1,200	1,500	3,000
Main circuits to ground (control apparatus)	2,350	3,300	3,800	6,100
Between main circuit leads with switches open	2,350	3,300	3,800	6,100
Motor leads to ground	2,250	3,080	3,500	5,600
Control circuits to ground	1,400	1,750	1,750	1,750
Between control circuit finger and contacts that are open in operating position	350	350	350	350

For line voltages not listed use 70 per cent of standard A.I.E.E. test voltage.

Form-Board for Concrete Track Foundation*

By Louis T. Botto

Superintendent Maintenance of Way Department, San Antonio Public Service Company, San Antonio, Tex.

Track construction with forms in place for concrete

IT SOMETIMES happens that, where the concrete paving foundation joins the concrete track foundation, a large crack in the asphalt paving surface appears. This break in the paving is very unsightly and often causes an expensive maintenance charge. With a view to correcting this, a new type of formboard, for use when concreting track

*Submitted in Electric Railway Journal Prize Contest.

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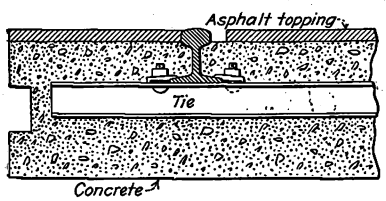
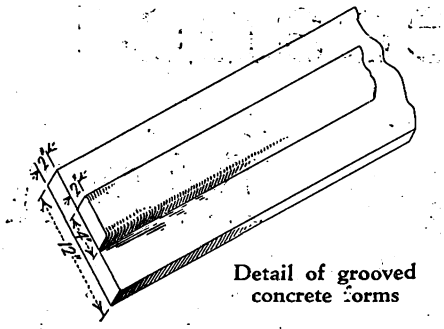




Detail of grooved concrete forms

and paving foundation, has been adopted by the San Antonio Public Service Company. It is constructed by nailing a 2-in. x 4-in. timber to the 2-in. x 12-in. plank that had been used previously as a side form for the concrete. After the 2-in. x 4-in. piece has been nailed in position, the edges are adzed round and smooth, so that it can be removed easily after the concrete has set.

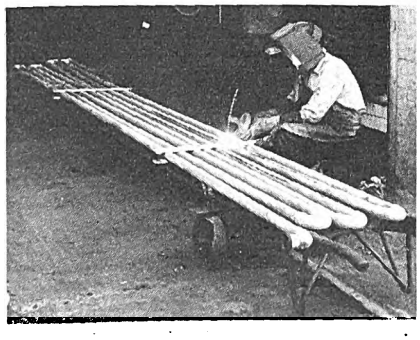
This simple and inexpensive construction has proved very successful, as the contractor's concrete makes a kind of mortise joint with the Traction Company's track foundation, and no breakage occurs where used.

Steam Heater Piping Repaired by Welding

By J. A. Duffy

Superintendent of Equipment Monongahela-West Penn Public Service Company, Fairmont, W. Va.

LEAKS in the steam heater piping in the Fairmont carhouse of the Monongahela-West Penn Public Service Company caused consideration to be given some time ago to the desirability of replacing it. The cost of replacement would have been $150, it was estimated. Seeing a chance to save money for the company, the shop force undertook to repair the piping by welding. This was done at a cost of $4 for materials, thus effecting a saving of $146 exclusive of the welder's time.



Welder repairing carhouse heating coils at Fairmont

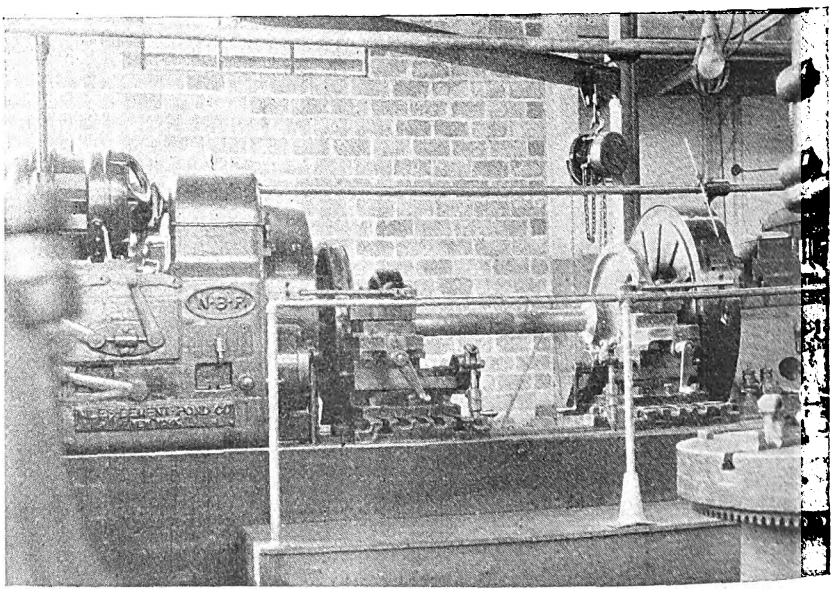
Wheel Work Speeded Up With New Lathe*

By C. B. Hall

Chief Clerk Mechanical Department, Virginia Electric & Power Company, Norfolk, Va.

WORKMANSHIP has been improved and more than half the time saved for wheel turning has resulted through the installation of a new Niles-Bement Pond Company's 42-in. car wheel lathe by the Virginia Electric & Power Company. The new lathe takes care of the turning of all steel wheels for the railway equipment which range in diameter from 18 in. to 42 in. Large shaft work is also done in the lathe. Previous to the receipt of this lathe, a 36-in. Lodge & Shipley lathe was used for this work.

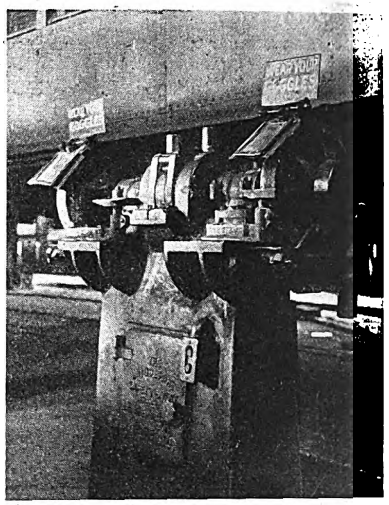
Wheels are moved into and out of the machine by means of a revolving crane of 6 in. channel and 7 in. iron, with an 8-in. upright and 6-in. boom with a chain-fall attachment.



New wheel lathe as installed in the shops at Norfolk

Emery Wheel Glass Visor

EVERY machine is carefully guarded and nothing is left undone to make working conditions safe in the shop of the Staten Island Rapid Transit Railway, Staten Island, N. Y. In the case of the emery wheels, two precautionary measures are taken to protect the eyes of the employees from flying particles of emery. Each wheel is equipped with a guard and a stationary glass visor. In addition the employees are compelled to wear goggles. A conspicuous sign over each wheel informs the men constantly that this is necessary.



Glass visors and signs warning workers to wear their goggles have reduced emery wheel accidents

The visor is shaped to conform to the contour of the wheel guard and is attached to the guard at an angle to permit an unobstructed view of the work. The brackets and frame are made from $\frac{1}{32}$-in. sheet iron. The glass is installed in guides, designed so that a glass can be removed or installed easily.

Since this double precaution has been taken emery wheel eye injuries have ceased.

*Submitted in Electric Railway Journal Prize Contest.

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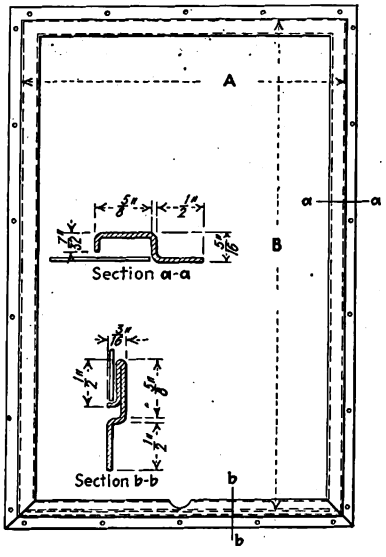
New Offerings of

Useful Equipment

Frames for Dashers

BELIEVING that pedestrian traffic forms a large part of the potential market for car transportation sales, and that a neatly framed sign is an important help toward increasing car riders, the J. G. Brill Company, Philadelphia, Pa., is now marketing dasher sign frames. These are available for standard size cards.

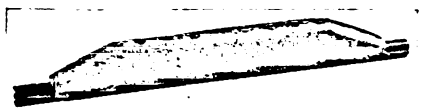


Construction details of new dasher sign frame

Butt-End Trolley Splicing Sleeve

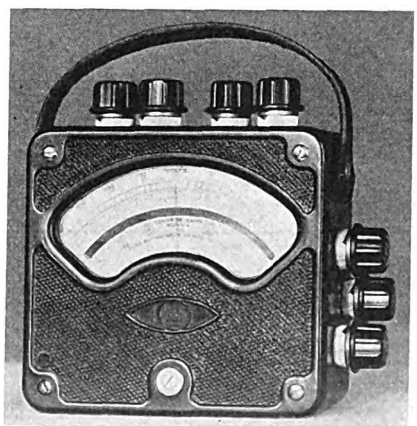
A NEW design of butt-end splicing sleeve for trolley wires, introduced by the General Electric Company, is so constructed that no portion of the sleeve extends below the groove of the trolley wire. The wire is attached in the sleeve by special screws inserted in shallow holes near the ends of the wire. The sleeve is said to be the lightest of equivalent strength on the market and the only one which gives a straight and smooth surface for the collector. It eliminates the splicing sleeve hard spot and thus insures as good a connection at the splice as at any other place in the overhead.

Two styles of the new splicing sleeve are available. One has a wheel clearance and the other is for a slider collector. The slider collector type in repeated tests has given better than 90 per cent of the ultimate strength of the trolley wire. It has been installed in several electrifications, one of the largest being in the Philadelphia-Wilmington section of the Pennsylvania Railroad.



Butt-end splicer for grooved trolley wire

Portable Instruments for Railway Testing



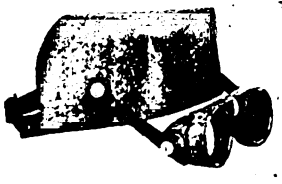
General purpose meter for railway testing

RAILWAY maintenance demands dependable instruments of lasting and reliable calibration and certain electrical properties necessary for testing. Among late developments by the Westinghouse Electric & Manufacturing Company are the Coded Current Meter and the General Purpose Meter, type PX-4, which are especially adapted to automatic train control testing. The Coded Current Meter has a twofold application in that it may be used as a standard instrument, as well as one especially designed to measure coded current. The transformation operation is very simple, and readings may be obtained quickly and accurately. The General Purpose Meter is a six-scale volt-ammeter, and takes the place of six instruments with its three voltage ranges and three current ranges. The various scales are accessible through seven insulated terminals and a push button.

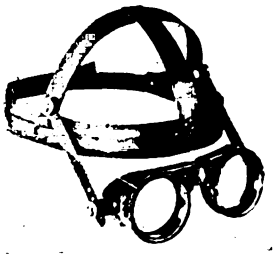
Skeleton Type Helmet Goggles

ACCESSORIES for welding and cutting recently added to the line of the Oxweld Acetylene Company, New York City, are the Oxweld cap and skeleton type helmet goggles. The No. 9 cap type consists of a strong fiber cap to which a pair of goggles is attached by means of fiber links. The goggles can be raised over the forehead or lowered over the eyes with one hand. The bridge is adjustable and is covered with rubber insulation. Replaceable lenses, in the same size and colors as are supplied in Oxweld No. 6 goggles, are used, the colored lenses being protected by cover lenses of clear glass. The No. 10 skeleton type goggles are the same except that the goggles are attached to a lattice skeleton cap. Both styles are provided with leather straps at the rear for head-size adjustment.

The cap and skeleton type goggles furnish adequate protection and are very durable. They have been found by welders who have used them to be extremely comfortable and convenient.



Goggles are attached to fiber cap by fiber links



Light construction is provided by attaching goggles to a skeleton helmet

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News of the Industry

Seeks Increase in Fare in La Crosse

The Mississippi Valley Public Service Company, La Crosse, Wis., has petitioned the State Railroad Commission for authority to increase its street car rates, alleging that it is operating under a deficit, and that its earnings for several years have fallen short of a reasonable return by $80,000 to $90,000 annually. In the petition the company asks for a cash fare of 10 cents and a token rate of six tickets for 50 cents, in place of the present 7-cent cash fare and token rate of eight for 50 cents. It further asks to be permitted to establish a five-car, twelve-minute schedule on the south side, 23rd Street line, in place of the present six-car, ten-minute service, and to be allowed to abandon car service on the Badger line from Fourth and Vine Streets to Losey Boulevard.

Constantly increasingly street paving obligations are declared by the company to be the greatest single factor necessitating the relief sought. Under the 1929 city program for construction, the company will be subjected to an outlay of about $91,000, of which, it estimates, almost half will be used in paving streets, the remainder in reconstruction of tracks. Such expenditures, it says, will not increase but diminish its revenues, by reason of the greater use of automobiles upon the improved streets, and will increase the investment of the petitioner upon which it will be entitled to a reasonable return.

Renewed Service on Lincoln Interurban Under Consideration

Restoration of passenger service on the Omaha, Lincoln & Beatrice Interurban, Lincoln, Neb., abandoned six months ago by permission of the State Railway Commission, is contemplated by the new owners with George P. Abel, wealthy paving contractor, at their head. Morris Freshman, vice-president and general manager of the company, which has been confining its activities to operating only the freight service on an East Lincoln belt line, says, that if the company is permitted to make certain changes in trackage, it will resume hourly passenger runs. Petitions from 700 residents of the suburbs of University Place and Bethany have been filed with the Council, asking that passenger service be restored. The Lincoln Traction Company has been running buses into part of the sections formerly served by the interurban, but this has not proved satisfactory to those located farthest from its route. The commission and the City Council have promised favorable action.

Abandonment was permitted because there was no money available for replacements and the state could not compel continued operation at a loss. The new owners purchased the stock from the Robinson and Musser interests of Akron, Ohio, to prevent the loss of freight service to industries they owned on its side tracks, and canvasses of the situation have induced them to resume passenger service. New equipment of cars of the double-end type with cross seats will be ordered, the track entirely reballasted outside the paved section, new concrete loading stations erected at needed points and wooden bridges replaced by permanent concrete construction. Direct service instead of shuttle cars will be run to University Place.

Unification Suggested for St. Louis

Preliminary report of engineers recommends to the transportation survey commission that a single company operate all the local transportation facilities under a terminable permit

COMPLETE unification of the city's transit facilities, and their operation by a single company under a terminable permit, was the outstanding recommendation made by Kelker, De Leuw & Company, Chicago, consulting engineers for the transportation survey commission at St. Louis, Mo., in their first report to that body.

The recommendations are similar to those advocated by Mayor Victor J. Miller some two years ago, and it is believed certain that the present city administration will support the program advanced.

The report was submitted by Rudolph F. Kelker, Jr. Pending final action on the report, the commission, at a meeting on Dec. 21, authorized modifications in a bill to be presented to the Missouri General Assembly next month, which would enable the city to proceed legally with its plans for a city-wide rapid transit system. The changes in the measure were of a minor nature, but were urged by Mr. Kelker as essential to obtaining quick action by the state lawmakers.

If Mr. Kelker's recommendations are carried out fully, it will mean that one company, probably the St. Louis Public Service Company, will acquire all existing transportation facilities including street cars, bus lines and service car routes. The same principle would be followed when and if the city builds subways or elevated rapid transit lines.

The advantages of unification pointed out by Mr. Kelker are: Elimination of needless duplication of service; lowest fares; best service; improvement of traffic conditions; reduction of operating expenses, especially in overhead; and provisions for adequate service in all parts of the city.

Mr. Kelker also advocates that the city have the right and power to purchase the property of the utility and terminate the permit granted it. He told the commission that a part of the income of the transportation company should go into a municipal fund, which in time would prove sufficient to purchase the transit property.

At present St. Louis transit facilities are on a competitive basis. The St. Louis Public Service Company operates all of the electric car lines in St. Louis and St. Louis County and also through its bus auxiliary, the St. Louis Bus Company, has a number of feeder bus lines, while the People's Motor Bus Company, a competitor, has a comprehensive city-wide bus system.

In addition, hundreds of independently owned service cars take business that should go to the street cars or

"Permanent Parkers"

STUDENTS of traffic problems in all the large cities are beginning to discover that one of the most difficult of its phases for which they seek the solution is that of the "permanent parker," the driver who leaves his automobile on the public highway all day long instead of taking it to a garage. He is the individual against which legitimate complaint is made. If he could be eliminated, there would be fewer demands for rigid parking restrictions.

Automobile owners undoubtedly suffer a hardship, when they are compelled to come into the congested urban centers, by their inability to find a place to park during short business stops. No city, however, has as yet possessed a sufficient traffic force or found the way to discriminate between the permanent and the temporary parker. The one is a nuisance for whom there is no real defense. The other is entitled to a reasonable freedom in the use of the streets of which he is part owner. The survey that can find a way out of this difficulty will win the gratitude of all motordom.—*Philadelphia Ledger.*

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buses. The city recently adopted a very rigid ordinance for the regulation of the service car lines, and it is believed that in a very short time they will cease to be a serious factor.

While Mayor Victor J. Miller and other city officials are openly in favor of a single transportation system, residents of some of the outlying districts, notably Lindenwood, Walnut Park, and the Holly Hills section are well satisfied with the present arrangement, under which service is competitive. They believe they have benefited. In view of this situation, it may require considerable work to educate thousands in St. Louis to advantage of single control of a complete transportation system.

A few years ago the interests that reorganized the St. Louis railway system endeavored to purchase the People's Motor Bus Company, but the deal fell through because of failure to agree on the price. Later the auxiliary bus company, the St. Louis Bus Company, began operations as a subsidiary of the railway.

Service Changes in Milwaukee Under Consideration

Extension of the Sherman Boulevard bus line to Keefe Avenue and the issuance of transfers from street cars to the Green Bay Avenue bus lines will be taken under consideration by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. Officials of the company state there is no way they can make the change and operate at the present fare, since Sherman Boulevard buses are operating beyond the line where a reasonable profit is returned on the 10-cent fare. The Green Bay Avenue line is operating at a loss.

Another County Heard from on Traffic

Considerable opposition is being aroused to any plans to reroute the street cars in Indianapolis, Ind., off Washington Street, the main business street, to eliminate traffic congestion. One patron in a letter addressed to one of the newspapers said:

In a recent issue of a national magazine, it was shown by actual counts made in numerous cities that the street railway passenger occupies only 6 sq.ft. of street space as compared to 44 sq.ft. for the auto rider; that the street car occupies only 2 per cent of the street space, yet carries 75 per cent of street users; that the larger the city, the more vital the necessity for the efficient use of street space. It also was shown that more than 91 per cent of downtown shoppers use the street car.

I imagine our merchants will be delighted with a plan to inconvenience 91 per cent of their customers in order to convenience 9 per cent. To a mere citizen it would appear that any plan of traffic control should give first consideration to the most efficient user of the street space, the street car.

Proposal Before Seattle Council

"Parents don't raise sickly children to health and then let them be adopted by others. So it is with our railway system." This graphic comparison, voiced by Councilman Philip Tindall, seems to represent the sentiment of the City Council of Seattle, Wash., toward the proposal that the municipal railway be leased to a private company for 50 years at a one-fourth "cut" of the line's possible profits. The Council now is considering this proposal and two others pertaining to the taxicab situation, as it touches on the trolley question, realizing that it must soon decide on some method of taxi regulation and railway retrenchment so both may prosper.

Karl H. Kaye wants to lease the railway for 50 years in return for an exclusive franchise for taxi operation within the city. This would bar all other taxi companies. E. W. Taggart of the Red Top Company, wants a similar exclusive franchise for 40 years, but without the risk of operating the trolley system, and promises to pay the city 2 per cent of his gross earnings for the concession.

This is countered by a new proposal from Frank Waterhouse, owner of the Yellow Cab Company, George Colman, owner of the Royal Blue Cab Company, and some ten other cab operators, who ask the issuance of certificates of necessity to all the cab companies now in operation. This would ban the expansion of the present operators, or the entrance of new companies into the city, until such time as the Council believes additional cabs are needed. The cab men also want a return to a straight meter basis with extra fares for additional passengers, and the right for any cab to park in any taxi stand along the streets. They also agree to pay the 2 per cent. They say that a return to meter fares would benefit the city's rail revenues by an aditional $100,000 annually, but at the City Hall it was said the change to zone rates saw no big change in receipts.

1,918,805,044 Passengers in Portland Without a Fatality

WHILE the nation celebrates "Safety Week," Portland has a man who has done more, perhaps, than any other to make public safety a national crusade. Credit for the slogan that has saved lives, "Safety First," is often given to Benjamin F. Boynton of this city. "Think," a trenchant suggestion to the heedless, is his. He has worked tirelessly and widely to develop the bump of caution. One of his rewards is the record of the company for which he works. The Portland Electric Power Company since Jan. 1, 1907, has carried 1,918,805,044 passengers and none has been killed.—*Oregon Daily Journal of Portland.*

Whatever plan is adopted by the Council, it is almost certain that the railway will not go again into private ownership. Mr. Tindall favors the granting of certificates of necessity, to prevent the demoralization of the taxicab industry in Seattle, but favors the zone system of fares with the right to charge for extra passengers.

Santa Claus Becomes Motorman in San Francisco

Santa Claus recently accepted an invitation to become a motorman for the Municipal Street Railway, San Francisco, Cal. He gave the children of the poor free rides to Christmas parties, feasts and entertainments.

Bringing the Force Together in Baltimore

The United Railways & Electric Company, Baltimore, has leased six entire floors in the new Court Square Building and about March 1 will move its offices from the Continental Building, where its offices are scattered over a number of floors.

Big Transit Developments Proposed for Cleveland

An open scramble for subway franchise rights in Cleveland, Ohio, developed recently when it became known that a $100,000,000 system of street railways, rapid transit and subways had been projected by the Cleveland Railway and Van Sweringen interests. The method of representation in the management has not yet been worked out, but it is understood that the Van Sweringens have considered the purchase of the Cleveland Railway.

The announcement of the proposal drew from Raymond Cragin, promotor of the Cleveland Subway Company, a statement charging that his offer to build subways worth $30,000,000, to be operated by the Cleveland Railway and paid for from street car fares, had been shelved by the railway. Mr. Cragin declared he had back of him certain groups "who believe it inadvisable to place temporary control of the city lines in the hands of those who permanently own suburban lines."

M. F. Bramley, president of the Cuyahoga Subway Company, has completed the circulation of petitions for an initiated ordinance granting his company the right to construct and operate subways, but has delayed filing the petitions with the City Council. A new company known as the Union Subway Company is advertising for persons to circulate initiated ordinance petitions.

Taxi Regulation for Cincinnati

Cincinnati's City Council has extended the present taxicab ordinance for two months, forbidding issuance of licenses in the meantime, to permit consideration of a new ordinance making cabs public utilities.

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From Criminals to Street Cars

Every day since New York's new police commissioner, Grover A. Whalen, has been in office, the newspapers have carried columns on his plans for the pursuit of the criminal. But the new commissioner's activity in catching criminals does not cause him to overlook other opportunities for making good newspaper "copy." In discussing the traffic situation on Dec. 28, the commissioner said:

I have a theory that the city is almighty and all-powerful. If we decide the surface cars must go, we will find a way to force them to go.

The street car companies talk and will continue to talk of "vested rights." Well, as far as I can see, their "vested right" now consists of the privilege of continuing to do business at a loss. Their own books show that, in many cases.

Twelve years ago the railways were offered the privilege of converting their surface lines into bus lines, their street car franchises into bus franchises. They couldn't see it. Now they are willing to make the change if the city will pay all the expense.

Then there is no doubt in my mind that the parking privilege is being abused. There must be some way we can work out a compromise with the merchants, a method which would permit women to shop by motor and still eliminate the nuisance parking that selfishly blocks the streets.

Planning for the future is slow work and we cannot expect much relief from new facilities for several years. But there must be a lot of things that we can do immediately with a little intelligent study.

In addition to taking up space in the middle of the city's most important thoroughfares, he points out, trolleys take up space in safety zones at intersections.

One of the first moves, when the results of the police traffic survey are in Mr. Whalen's hands, will be to call a conference with the merchants. He favors the handling of certain types of merchandise at night.

St. Louis Wage Argument Finished

Final arguments were submitted before the Missouri Public Service Commission, on Dec. 21 and 22, on the wage demands of the carmen and shopworkers of the St. Louis Public Service Company, St. Louis, Mo. The union men have requested higher wages and better working conditions. A counterproposal of the company was for reduced wages.

Lloyd Landau, special counsel for the company, said that last May when a strike of the street car men threatened, Mayor Victor J. Miller called both sides into a conference at which it was agreed the dispute should be submitted for arbitration by the state board with the city acting as an interested party in behalf of the car riders. The city, however, has merely acted as an observer, submitting no evidence and no briefs.

Contending that the company had been brought into the arbitration by the city and then left to its own devices in presenting the case, Mr. Landau called upon Forrest Ferris, Jr., an associate city counselor, who was present, for an explanation of the city's stand. Mr. Ferris replied the city had bound itself to abide by any wage grant the commission might make, but had not bound itself to approve any increase in fares as a result of such wage awards.

Film Features 1929 Tokyo World Congress

A film, designed to arouse the interest of engineers in the World Engineering Congress to be held in Tokyo, Japan, in 1929, was shown for the first time before a group of engineers in New York on Dec. 18. The film will be exhibited at meetings of engineering societies in the principal cities of the United States, it is understood.

In addition to the glimpses of Japanese statesmen and engineers associated with the Congress that the film depicts, engineering enterprises in Japan which are to be visited by delegates to the world meeting also are shown. Views of each of the chief cities are included, and special attention is given to the sights in each city of interest to engineers.

T. E. Mitten Retires from Bank Post

T. E. Mitten will retire as president and chairman of the board of the Mitten Bank and Trust Company. This was announced after nineteen directors, elected at a meeting of stockholders, had selected officers for next year. W. K. Myers, vice-president of Mitten Management, Inc., was elected president of the bank and Dr. A. A. Mitten was named to succeed his father as chairman of the board.

According to the announcement these changes are in accord with Mr. Mitten's plan to withdraw from the active leadership of Mitten managed properties, leaving their direction to the younger members of Mitten Management, Inc.

100 Per Cent Operation for Five Consecutive Days in Chicago

A new record in service was made by the Chicago Surface Lines during the week before Christmas when all of the 3,639 passenger cars on the system were in operation for five consecutive days.

In 1926 the system approached 100 per cent operation on several days during the Christmas shopping season and atttained it on one day. Last year 100 per cent operation was accomplished on three days during the shopping season.

In order to keep all the cars in operation for five consecutive days, the most careful organization of shops and carhouse repair crews was necessary. Schedules of overhauling and car repair work were speeded up during the latter part of the summer and early fall so that all equipment might be in the best possible condition. After the shopping season began to demand more service, the number of cars in the shops and in repair bays in the carhouses was decreased daily and the equipment was put out on the street.

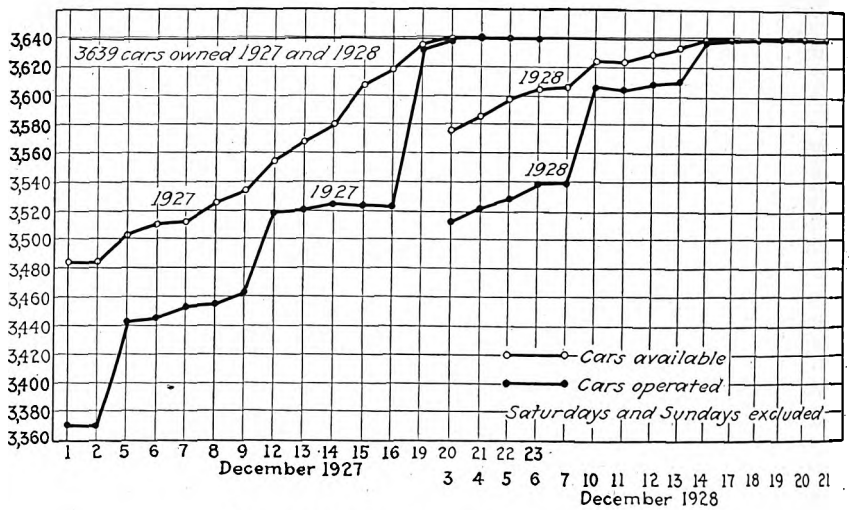

Chart showing performance of Chicago cars

On Dec. 17, H. H. Adams, superintendent of shops and equipment, reported that every car was out on the streets and he was able to maintain the equipment so that all of the cars were subject to call for rush hour periods every other day of the week up to and including Dec. 21.

In order to accomplish this, it was necessary to do some quick repair work on a number of cars damaged in traffic accidents. One car in particular, which was badly damaged on Friday, when it was struck by an oil truck, was repaired in record time.

The Chicago Surface Lines also made a new record for riding during the Christmas shopping season. Saturday, Dec. 22, was the biggest day in the history of the company, with 5,296,081 rides, including transfers, and 2,934,442 revenue rides. The riding for the week, in spite of inclement weather during the first days, exceeded that during the similar week last year.

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Experts Favor Car Riders

Many interesting facts about accidents, parking, etc., revealed by New Orleans survey

THE IMPORTANCE of street cars as carriers of a large proportion of the population, the small percentage of accidents caused by street cars, the many traffic violations by motorists, the futility of parking laws, and the failure of traffic control to avoid congestion, are among the many features of interest and importance to the street railway industry and the public in the report of experts on traffic conditions in New Orleans just submitted to the City Council.

The study was made by Miller McClintock of the Albert Russell Erskine Bureau of Harvard University, and Harland Bartholomew, St. Louis. It includes a thorough survey of all phases of traffic control, with a proposed remodeled traffic ordinance for the city.

The following provisions of the proposed code relate to street cars:

1. No passing of a street car on the left, except on one way streets or on streets too narrow on the right to make passing possible. Where a safety zone is established, a vehicle need not stop before passing a street car discharging or receiving passengers.
2. Any vehicle on the street car tracks in front of a street car must leave the tracks "as soon as practicable" after signal from the street car. No vehicle shall drive upon or across the car tracks within the intersection in front of a street car, when the car has just started to cross an intersection.
3. No vehicle shall drive over or through a safety zone.
4. No person shall board or alight from a street car or other vehicle in motion.
5. No person shall ride on any part of a street car or other vehicle not intended for passengers, except employees in discharge of duty and those in truck bodies in space intended for merchandise.
6. No steam or street railway train or car shall obstruct the street longer than five minutes. This does not apply to trains or cars in motion unless engaged in switching. No street railway train or car shall stop within an intersection or on a crosswalk to receive or discharge passengers.

Says the report:

New Orleans is fortunate in the possession of so large a number of neutral ground streets, which permit the segregation of street car and vehicular traffic. This separation of right-of-way is of great advantage in street car operation and at the same time permits a greater freedom of movement of vehicles upon street car streets than would be possible otherwise.

Only 1.06 per cent of personal injury accidents are caused by street cars, while private passenger cars cause 69.26 and trucks 18.76 per cent. Bicycles cause 2.88 per cent, motorcycles 2.52, horse vehicles 2.34, taxicabs 2.12, other vehicles 0.47, motor buses 0.28, railroads 0.23, and unknown 0.08.

In data showing the classes of public accidents in New Orleans from 1921 to 1927, it is noted that the total increase from 696 to 1,165 can be attributed to motor vehicles. In the same period, the report states, accidents from street cars have constantly declined from 156 in 1921 to 63 in 1927. To no small extent, says the report, this is due to improved operating and safety conditions.

A traffic engineering division is recommended, with a competent traffic engineer and at least four traffic investigators. A regular parking squad of not less than twelve officers is also recommended. "Of all aspects of traffic control in New Orleans at the present time," the report says, "the enforcement of the parking regulations is by far the most unsatisfactory."

To determine the total concentration of vehicular traffic in the central business district, a count was made on several days from 8 a.m. to 6 p.m. It was found that 66,846 automobiles entered that district in a day and that the average automobile carried only 1.6 persons.

According to the New Orleans Public Service, the average street car carries into this district each day from 8 a.m. to 6 p.m. 37 passengers.

It is shown in the report that the largest number of motor vehicles in the central business district at one time, either parked or in motion, occurs at 4:30 p.m., when approximately 6,200 are there. This peak of accumulation occurs in other large cities studied between 12 noon and 2 p.m. It is, therefore, deduced that in New Orleans there is a larger use of motor cars by persons who leave them within the district the entire day than is to be found in other cities.

What a Railroad Is Worth

Another plea made for a definite pronouncement by the Supreme Court of the legal principles which shall govern valuation for rate-making and recapture of excess earnings

IN FIXING the valuation of a railroad for recapture purposes under the Transportation Act, consideration should be given to all relevant facts and circumstances including the present level of reproduction costs, according to a brief by the St. Louis & O'Fallon Railway and the Manufacturers' Railway, jointly owned, filed on Dec. 14 in the Supreme Court, which has fixed Jan. 2 for hearing arguments in the case. Since certain fundamental questions are involved, the matter is regarded as of widespread interest to all utility corporations.

The case is essentially an appeal from a decision of the Federal District Court for the Eastern District of Missouri, sustaining in most part an order of the Interstate Commerce Commission, in which it was held that the net railway operating income of the O'Fallon railroad for the last ten months of 1920 and the calendar years 1921, 1922 and 1923 exceeded 6 per cent on the value of the property of that carrier and requiring the road, under the recapture provisions of the Transportation Act, to turn over to the commission 50 per cent of the excess which the commission found in each period.

In seeking to have the Supreme Court reverse the decision of the district court, the brief attacks the decision of the lower court on the grounds that the O'Fallon and the Manufacturers' railways, contrary to the finding of the commission, constitute a system of carriers under common control and management, and that the valuation and earnings of both roads should have been taken into consideration instead of the O'Fallon alone. Says the brief:

It appears upon the face of the report that the commission did not determine or undertake to determine the "present value" of the O'Fallon by consideration of all relevant facts and circumstances, but that its so-called findings of value in respect to the O'Fallon were based upon a mathematical formula, the avowed purpose of which was to determine the approximate investment in its property; that the commission refused in such so-called determination of value to give either effective weight or any weight whatsoever to the present cost of construction; that such refusal was not based on any fact or facts found by the commission pertaining to the property of said carrier, but upon the conclusion of the commission that no consideration should be given to present-day prices in determining the value of any railway property for the purpose of either rate making or recapture; that the commission's so-called findings of value are based upon an erroneous conception of the law and of its powers thereunder and are unsupported by and contrary to the evidence; and that the true value of the O'Fallon greatly exceeded the so-called values found.

The brief points out that, under the provisions of the Transportation Act, all net railway operating incomes in excess of one-half of the amount by which such income exceeds 6 per cent of the value of the carriers property remain the absolute property of the carriers and, consequently, the order of the commission, if it takes more, constitutes the taking of the carriers' property without due process of law, and a taking of private property for public use without just compensation.

The carriers charge in the brief that

Prize Beef

FIFTEEN yearling Hereford steers, averaging 1,060 pounds, were purchased by the Chicago, South Shore & South Bend Railroad to be used in the serving of choice cuts on dining cars during the Christmas season.

The steers, all prize winners, raised by Allen Newland & Son, Hudsonville, Ill., were purchased through Armour & Company. They were prepared for slaughter right after their purchase and appeared in the form of special steaks and roasts on South Shore Line dining car menus.

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the Interstate Commerce Commission greatly exaggerates the supposed "unfavorable economic consequences" which might occur were freight rates made on the basis of the true value of the property. The brief continues:

The present rate-making rule is believed to be a salutary rule. It has led to no unfavorable economic consequences in the past. Despite its observations as to what might have been or might be, the commission is obviously of the view that it will lead to no unfavorable economic conditions in the future. If contrary to such expectation, the restraint of self-interest and of the power reserved to the commission in the maintenance of individual reasonable rates should turn out to be inadequate to protect the commerce of the country against exorbitant charges, under the rate-making rule prescribed by Section 15a as it now reads, Congress has full power either to repeal or modify it.

The brief contends that the Interstate Commerce Commission should have determined the value of the O'Fallon railroad in accordance with established law, but instead guessed at the original cost which was actually unknown.

The value of a public utility property, whether it be a railroad or a water plant, may be more or less than the sum of the cost of reproduction, less depreciation, if any, of its several units. Property is not all of the same quality. Consequently, the relevant facts and circumstances vary as to different properties, and no formula can be employed.

The railroads in this case are merely insisting on the same constitutional protection given other utilities, according to the brief, which points out that "on proper analysis it appears that the only difference between the original cost as of 1910, and the reproduction cost as of 1920-3 for the O'Fallon railroad is that the former is expressed in past prices measured in an obsolete dollar, whereas the latter is measured in today's dollar.

The brief says that the public utilities of the country other than railroads, as a result of the decisions of the court, have not been excluded from the operation of this economic law which has affected all of the monetary transactions of the country. The railroads should not be excluded, and cannot be, without actual deprivation of property.

Transportation Association Committee to Study Equipment

Detailed consideration of the scope of its assignment occupied the attention of the new transportation and traffic committee on "The Equipment," at an organization meeting held at association headquarters in New York on Dec. 6, 1928, with Adrian Hughes, Jr., chairman, presiding. This committee, under the new plan of committee assignments in the transportation and traffic association, includes the work of the former bus committee of that association and, in addition, covers the study of rail equipment from the several angles of interest to transportation men.

It was decided that the committee's work properly embraces the general question of the size, arrangement and character of public transportation vehicles. This year's study will be confined to surface cars and buses for use in cities above 75,000 in population, since another committee has been organized to study the specific transportation problems of the small community.

The work of the committee for the year will be divided into three principal divisions. First of these is a study of the facilities that should be provided on modern car and bus equipment for the comfort and convenience of passengers, to the end that the service may be made as attractive as possible. In this phase of the study, consideration will be given to the relation between the particular class of service in which the vehicle is to be used, and the character of equipment which is desirable and practicable under these conditions. The second division of the committee's subject will deal with the determination of the general size and characteristics of public transportation vehicles most suitable for various classes of service. Both studies will include buses as well as rail equipment, and will develop the matter of equipment size and characteristics in its relation to such service conditions as heavy trunk line service in large cities, cross town and secondary lines, service in moderate sized cities, special combinations of express and local service, de luxe scheduled service, chartered and tour service, etc. Consideration will be given to the possibilities of trackless trolleys.

A third division of the committee's work contemplates the preparation of a report outlining the need for accounting information, that will serve as a guide in transportation management by giving needed data regarding the results of operation of individual lines, both cars and buses. This is a continuation of the work done last year by the bus committee in suggesting a similar arrangement of accounts with respect to bus operation. It is the intention to prepare a tentative outline of the accounting information needed for intelligent transportation planning and management, in the hope that the Accountants' Association may be interested in the need for this classification of operating information not provided by the present classifications of accounts.

In addition to the above program, it was decided to suggest to the American Association that the new committee on car financing undertake to obtain accurate information regarding the actual results achieved with new equipment, in the way of increased revenues and reduced costs, supplementing and bringing up to date similar information previously collected by other committees and agencies. Those present at the meeting included the following: Adrian Hughes, Jr., R. J. Bennett, J. F. Craig, H. H. Dartt, C. F. Kells, E. R. Kelly, T. R. Langan, T. W. Noonan, E. A. Palmer, M. W. Rew, A. Shapiro, E. F. Theisinger, representing C. W. Stocks, J. C. Thirlwall, H. B. Whitman representing A. T. Warner, J. W. Welsh, Charles Gordon, G. C. Hecker, and Samuel Riddle, sponsor.

Bondholders Object to Chicago Plan

Representatives of holders of Chicago Railways bonds says proposed financial scheme will not work

DECLARING that the City Council has been proceeding on the wrong theory in attempting to work out the details of an ordinance before obtaining the necessary enabling legislation from the General Assembly, Albert W. Harris, chairman of the bondholders' protective committee of the Chicago Railways, urges that attention be centered on legislation and that negotiations for an ordinance be delayed until this step is taken.

The proposed ordinance which company and city officials have been discussing for some time, Mr. Harris says, is "essentially a municipal ownership franchise and attempts to fix rates and arrange an income which within 40 years will result in city ownership out of earnings and accumulated interest of various funds. It provides in the interim for a local commission which will practically run the property. Nowhere in the franchise does it agree to buy, and the rates proposed, in my opinion, will not be adequate to meet the requirements called for by the plan." He also said:

It sets up a financial scheme which will not work and under which any company to be formed to take over the properties could not set up a workable financial plan. And, finally, it purports to be a service-at-cost franchise when it is not, because of the extra charges put upon the car rider for the purpose of purchasing the property. In other words, it is a municipal ownership franchise without agreeing to purchase. It proposes a consolidation of surface and elevated lines under an impossible financial scheme and gives to a local commission all the powers of an operating body, and the details of the franchise will not make it possible to carry out the plan, if such it may be called.

Admitting that the details might be changed, such as an agreement for a reasonable return on the capitalization, suitable rates of fare agreed upon from time to time instead of for a fixed term of years, etc., it would not change the fundamentals embraced in the franchise. This is the third attempt to settle the railway matter by taking up the last thing first, viz., the franchise, and illustrates the futility on the part of the transportation committee, who have no authority in law for making the kind of trade they are trying to make, in trying to trade with people who have no authority to trade. Legislation must first be had making it legal to take the action necessary and a company must then be formed with which the city can deal.

There should be only two parties to the kind of trade proposed—a company and the city, both with authority to trade—not three companies and the city, neither with power to act, neither agreeing upon what they want. To carry the above procedure out, the legislation should first be had, next a company should be formed to take over the consolidated properties, and, third, a franchise should be entered into between the city and the new company. This is the plan originally proposed after a great deal of discussion, and the fact that it has not been carried out is the reason why nothing has been accomplished.

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Wanton Destruction of Cars Charged in Rochester

Rochester lines, New York State Railways, has declared war on vandalism in the 12-mile municipally built and railway operated subway at Rochester, N. Y. In a statement asking public co-operation to prevent destruction of property, Charles E. Lewis, superintendent of interurban transportation for the railways, complained that hinges on doors and light bulbs have been broken and stolen, and subway stations generally defaced. He suggested that the public report loiterers about the stations.

The subway, which began operation on Jan. 1, 1928, is located in the bed of the abandoned Erie Canal. High speed locals, interurban and freight lines use the erstwhile "big ditch" of Clinton.

Newspaper Urges Paving Relief in Grand Rapids

Relief from the burdens imposed by meeting paving requirements is being urged by the Grand Rapids *Press* in the interest of securing a square deal for the Grand Rapids Railroad. The situation as that paper sees it is, perhaps, best described in the exact words of the paper's editorial presentation, in part as follows:

Grand Rapids has been asked to consider its street railway system in the light of the experience of Michigan's destroyed interurbans. The railway system is worth $6,000,000. It is maintained by public spirited men who have passed up dividends year after year in order to put their returns back into tracks and rolling stock for the service of the Grand Rapids public. Its progressiveness and efficiency of operation have been rewarded by presentation of the Coffin medal to Manager DeLamarter. Its economy has brought committees and administrative experts from other centers to study the details of car rebuilding and service policy.

Under a service-at-cost franchise, fares in this city are adjusted to income with an 8 per cent limit on the company's earnings. In the year ending Oct. 31 the actual earnings were 5.95 per cent.

Facing this situation the proposal has been made that the company go over to buses. City Attorney Taggart has asked for an estimate of the effect of such a change upon the city and upon the railway. It is obvious, in the first place, that abandonment of the tracks would at once relieve the company of the cost of paving between them, an expense for which there is no justification. In the second place, its rolling stock would be taxed by the state instead of the city, and Grand Rapids would lose the income. That is, gasoline and license taxes for state highway maintenance would be substituted for city taxes; and at present only a trifling part of the motor vehicle taxes paid by a city comes back to it. Finally, in place of the fixed street car with its minimum effect on traffic congestion, we should have a fleet of heavy buses increasing street hazards, swinging in to curbs for passengers, and wearing out brick and concrete instead of company rails.

Consulting Engineer Wagner estimates that had the company been operating a bus system last year it could have saved $50,541 in taxes, using as a basis a fleet of 202 buses and including state license and gasoline taxes. Mr. Wagner's conviction is that such a change is inevitable, unless the city meets the situation by relieving the company of part of its expense.

There is no reason why, as soon as the necessary charter steps can be taken, Grand Rapids should not free the company from the paving charge. That step would be an economy, not a loss, in the long run, entirely aside from the inequity of charging motor traffic highways against rail traffic which never touches them.

Original Ideas in Wisconsin on the Use of Old Cars

When buses and one-man cars replaced the old equipment of the Wisconsin Public Service Corporation at Green Bay, Wis., ten old cars were dismounted and the bodies sold. But such replacement did not spell the end of the cars. For driving into the city on Highway 141, one comes upon an old interurban car which has been transformed into the "Trolley Barbecue." In one end of the car alternate seats were removed to make room for tables, giving the place four tables seating four persons each. The other end of the car has a counter running lengthwise. The vestibule beyond is occupied by a large brick barbecue fireplace equipped with an electric turnspit.

So-called "Trolley Barbecue" on Highway 141

On the Sturgeon Bay road, one of the old cars has been set up on stilts at the rear of a roadhouse, to be used as a restaurant. The Bay road leads to another old car, disguised almost beyond recognition. Wide porches have been built at either side and around the front end which faces the bay. The seats have been removed from the car and arranged around the porches. The whole "cottage" has been painted white.

The Wisconsin Public Service Corporation began in 1921 to change to Birney cars. The first one was put in service that year and by 1924 the old cars had been practically replaced. Buses went on the interurban run. The Green Bay carhouse had seventeen old cars. Five of them were dismantled, but the bodies of the others were sold, bringing from $50 to $100 apiece.

Paving Matter Discussed in Lynchburg

Negotiations are under way between officials of the Lynchburg Traction & Light Company, Lynchburg, Va., and City Manager R. W. B. Hart, looking to a compromise on the franchise stipulations in regard to the paving of track areas in certain streets.

A previous proposal of the City Manager, which called for payment by the railway of $8,500 to the city for a period of fourteen years, was frowned upon by the company officials, and as yet no agreement has been reached.

According to Mr. Hart, the company has submitted to him a tentative draft of certain proposals, and he said he would have to go over and revise this draft and resubmit it to the company again.

Excursion to See South Side of Chicago

In an effort to acquaint more residents of Chicago with the electrified suburban train service that is being furnished the south side of the city, the Illinois Central Railroad recently offered a special 25-cent round trip fare between any two points on its Matteson, Blue Island and South Chicago suburban divisions. The special excursion tickets were good on Sunday only—the date of issue—between certain hours of the morning and certain hours of the afternoon. "Stop-Overs" were allowed at any point en route.

This was the first excursion of the kind ever conducted by the Illinois Central on its Chicago suburban lines.

Car flanked with wide porch for use as summer cottage

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Holiday Services for Students on Southern Pacific Routes

The Southern Pacific Company put on its special service on the Red Electric line for holiday students from Oregon State College, the University of Oregon, and the Oregon Normal School. It also offered accommodation to a number of smaller private schools down the Willamette Valley.

New Fare Arrangement in Decatur

Tentative agreement between the city of Decatur, Ill., and the Illinois Power & Light Corporation, subject to approval of officials of the latter company, has been reached, providing for lower tariffs when large blocks of tickets are purchased.

The City Council protested the recent fare increase, attempted to reopen the case before the commission and agreed to accept the conciliatory efforts of the Association of Commerce. A 10-cent basic fare and the three-for-a-quarter ticket plan are retained, but seven tickets are available for 50 cents and fifteen for $1 with twenty school tickets in a book for $1.

Safety Rewards in Jacksonville

Turkeys and hams were presented to operators and conductors of the Jacksonville Traction Company, Jacksonville, Fla., who aided in the operation of cars without chargeable accidents. The contest, which lasted 80 working days, closed on Dec. 15. Winners included 89 operators and eleven conductors. In addition, eighteen other men operated without chargeable accidents, but had not worked the number of days required for recognition.

Settlement of Construction Work in Lebanon

Several injunction proceedings instituted by Lebanon, Pa., against the Lancaster, Ephrata & Lebanon Street Railway in the Court of Common Pleas of Lebanon County, to compel relaying of tracks to paving grade, and repaving by the company of six blocks on Walnut Street in Lebanon, were decided adversely to the city by the lower court. The decision was upon the ground that there had not been a formal and lawful establishment of the new grade.

The city thereupon went before the Supreme Court, where the appeals were pending until recently. In the meantime the officials of the railway and the Councilmen of the city entered into amicable conferences and determined upon a program of co-operation. The railway furnished its men for grading and lowering of tracks, and the city furnished the stone and the oil.

The outcome was so satisfactory to the city officials that the appeals which were made to the Supreme Court have been discontinued.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***Jan. 4, 1929*—Metropolitan Section, American Electric Railway Association, 33 W. 39th St., New York, N.Y.**

***Jan. 14-18*—American Road Builders' Association, convention and road show, Cleveland, Ohio.**

***Jan. 15-16*—Kentucky Association of Public Utilities, annual meeting, Brown Hotel, Louisville, Ky.**

***Jan. 22*—New York Electric Railway Association, mid-winter meeting and dinner, Hotel Commodore, New York, N. Y.**

***Jan. 23-25*—Electric Railway Association of Equipment Men, Southern Properties, and Southwestern Public Service Association, Mechanical Division, joint meeting, Houston, Tex.**

***Jan. 24-25*—Central Electric Railway Association, Claypool Hotel, Indianapolis, Ind.**

***Jan. 25-26*—Central Electric Railway Accountants' Association, Claypool Hotel, Indianapolis, Ind.**

***Jan. 28-Feb. 1*—American Institute of Electrical Engineers, annual convention, 33 W. 39th St., New York, N. Y.**

***Feb. 7-8*—Midwest Electric Railway Association, Midwinter meeting, Robideaux Hotel, St. Joseph, Mo.**

***Feb. 14*—Central Electric Railway Master Mechanics' Association, Youngstown, Ohio.**

***Sept. 28-Oct. 4*—American Electric Railway Association, 48th annual convention and exhibit, New Public Auditorium, Atlantic City, N. J.**

New Association Members

MEMBERSHIP in the American Electric Railway Association was voted by the executive committee at its meeting held in New York on Nov. 25 to four manufacturer companies, one associate and fourteen individuals. New company members are:

ASSOCIATE

Jackson & Moreland, consulting engineers, Boston, Mass.

MANUFACTURER COMPANIES

Anderson Body Company, Sidney, Ohio.
Cleveland Graphite Bronze Company, Cleveland, Ohio.
Highway Service, Inc., New Bedford, Mass.
United States Nito Company, Inc., Columbus, Ohio.

Hearing on Wage Increase for Indianapolis Men Set

First hearing on the petition of employees of the Indianapolis Street Railway, Indianapolis, Ind., for a 15-cent increase in pay has been set for Jan. 10, according to an announcement by Frank Baker, attorney for the Amalgamated Association. The hearing will be held before Howell Ellis, a member of the Indiana Public Service Commission. Mr. Baker said the Indianapolis pay schedule of 40 and 45 cents an hour was below that of any other city of similar size in the United States and Canada.

Higher Fare Sought for Green Line

Officials of northern Kentucky communities utilizing the Green Line of the Cincinnati, Newport & Covington Railway Company heard a plea on Dec. 14, made by H. C. Blackwell, president of the Green Line, for increased fares. Mr. Blackwell told his audience the Green Line is losing money. He said its physical value is about $8,000,000 and its earning capacity should be $1,200,000 a year. But instead the Green Line is showing a net annual earning of only $299,000. This leaves it about $900,000 a year short of an adequate return.

Mr. Blackwell had first broached the topic at a dinner he tendered officials in Cincinnati some months ago. On Nov. 16 the Covington commissioners heard it, and at the latest gathering the speaker expressed willingness to meet the officials in each of the communities, but would prefer to negotiate with a committee of business men representing all the towns and cities.

His idea of a satisfactory fare is one similar to that in force in Cincinnati, which is three tickets for 25 cents or 10 cents cash for a single fare. He observed that the average carfare all over the country at present is 8.2 cents, while Green Line riders pay a nickel. In summing up his position President Blackwell said that the present 5-cent fare could not continue, that the company was not earning even expenses and that bridge tolls and terminal charges brought the fare on the line down to 4½ cents.

He seeks a franchise running twenty years and calling for a higher fare, in place of the present perpetual franchise which fixes the fare at 5 cents.

More Free Ride Privileges in Detroit

Free rides have been voted by the Street Railway Commission of Detroit, Mich., to all employees of the department, totalling 7,500. Heretofore only platform workers in uniform have been permitted to ride without charge. A system of identification for all non-uniform employees will be worked out by the Department of Street Railways, it was decided.

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Recent Bus Developments

Substitutions in Connecticut

Permission was granted to the Connecticut Company to discontinue railway service between Winsted and Torrington, Conn., and between Thomaston and Fort Sill, Waterbury, Conn. The service will cease on Jan. 5 and will be succeeded on Jan. 6 by bus service by the New England Transportation Company. The latter company will operate a through bus service from New Haven to Winsted via Waterbury, Thomaston and Torrington. At the same time the Connecticut Company was authorized to replace railway service in Portland and between Portland and Middletown, Conn., a route which crosses the Connecticut River, with bus service. Service on this route will be changed on Jan. 13.

Blanket Permit Sought in Berkshire County

Through Clinton Q. Richmond, general manager of the company, the Berkshire Street Railway has presented a petition asking for permission to operate buses on any or all of its trolley routes operating throughout Berkshire County in western Massachusetts. The blanket permit would be subject to the approval of the Public Utilities Commission on each subsequent bus line before operations could be started.

Petersburg Company Seeks Agreement With Railway

Officials of the Southside Transportation Company, which is under new management, plan to increase the service of the company and will apply to the Petersburg City Council for universal transfer service and an increased fare. It will ask for a 7-cent fare and the universal transfer, which will be acceptable on all of the lines, buses and street cars operated in Petersburg by the Virginia Electric & Power Company.

Illinois Properties Cannot Be Sold

Rehearing of a petition to sell its subsidiary motor coach properties, known as the Alton Transportation Company, to the Chicago & Joliet Electric Railway and the Illinois Power & Light Corporation was denied to the Chicago & Alton Railroad on Dec. 18 in an order entered by the Illinois Commerce Commission. At the same time, the commission annulled the certificate previously granted the Alton Transportation Company for the transportation of passengers between East St. Louis and Chicago over state highway No. 4 and awarded the permit to the Tri-State Bus Company, Springfield, Ill.

Opportunity for Development Given to Pacific Electric

In a divided opinion, Commissioner William J. Carr dissenting, the California Railroad Commission denied on Dec. 17, the application of T. C. Gillespie to operate auto stage service locally between Hollywood and Ocean Park. He was granted permission to reroute his buses.

In the same opinion the commission ordered the Pacific Electric Railway, protestant against the application, to submit to the commission, after conferring with the parties appearing in the present proceeding, a plan to experiment adequately with the operation of bus service to meet the situation developed in the present proceeding. The commission took this action because of its belief that the Pacific Electric Railway, which at present occupies the field with its railway service, has striven to furnish an adequate service, and at reasonable rates, and if there is a demand for bus operation between the points involved in the present operation, the Pacific Electric Railway should be given an opportunity to supply that service, or to experiment toward such development.

Commissioner Carr in his dissenting opinion agrees with the conclusion that, under the record in the proceeding, the commission cannot refuse the Hollywood-Santa Monica section some relief in the way of addition or improved transportation. He held that natural sympathy for the Pacific Electric, in its struggle to make its passenger business pay, should not lead to the establishment of a new principle or rule, which places existing utilities in a highly entrenched position and correspondingly discourages all new utility enterprises. He is of the opinion that Mr. Gillespie should be permitted to render a service recognized as necessary.

The majority opinion points out that the Pacific Electric Railway has made experiments in the development of bus transportation and also in the matter of revising its rates, with the view to developing additional traffic and additional revenue, such efforts being made under the direction and with the approval of the commission.

The commission concluded as follows:

The record before us shows that the passenger operations of the protestant's railway on the whole are conducted upon a very narrow margin of profit. If a substantial amount of business is diverted by a policy of unrestricted competition from bus lines, added to the competition of private automobiles, its revenues very probably would be reduced to a point where virtual abandonment might be necessary.

Crude Oil Used Successfully in Philadelphia

ALTHOUGH some of the best chemists and analysts have insisted that crude oil cannot be used as fuel for buses, the Philadelphia Rapid Transit Company is now operating twenty buses with crude oil. That means a saving of $50 per bus per month, and as the system will soon be operating 1,000 buses, a substantial saving will be made for the company. An apparatus has also been developed to analyze and test the bus exhaust gases, making it possible to reduce the percentage of carbon monoxide to between 1 per cent and 3 per cent, whereas the average for all motors is 5 per cent to 9 per cent. Not only will this safeguard the health of bus riders, but if this method could be applied to all motors, the tragic deaths from this source would be greatly reduced.—*Service Talks.*

Would Abandon in Hudson and Greenport

The Eastern New York Transportation Corporation, Rensselaer, N. Y., has applied to the Public Service Commission for permission to abandon its existing bus service in Hudson and Greenport, alleging that the income from operation has not been sufficient to pay the operating costs. It states that the total operating revenue in 1927 was $18,650 and the total expenses $25,786, while from January to November inclusive, in 1928, the income was $24,314 and the expenses $31,596.

In the petition it states that it has conformed to various local requests with reference to the bus service, but that it has been unable to continue operations without obtaining advances of contributions from the Eastern New York Utilities Corporation to make up bus deficits. Conferences have been held with the local authorities in relation to a change in the local franchise under which the company operates, but no action has been taken by the Hudson Common Council committee toward relief in the form of a 10-cent cash fare, thirteen tickets for $1. The company does not believe there would be much relief under the 10-cent fare proposed.

St. Louis Agrees With Company Request

City Counselor Muench of St. Louis, Mo., recently filed a brief with the Missouri Public Service Commission, in which the city joins the St. Louis Public Service Company's request for the abandonment of its Vandeventer Avenue car line between Market Street and Natural Bridge Avenue, provided that adequate bus service is substituted. The city holds the state commission has authority to impose a condition that buses be supplied for patrons if the line is to be abandoned.

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Financial and Corporate

$47,000 Improvement in Toledo in November

Revenue of the Community Traction Company, Toledo, Ohio, was $316,389 for November, a gain of $43,260 over the corresponding month of last year, reflecting better industrial conditions and active business in the community. Passenger revenue on the street cars was $235,665 and total revenue $248,838. This left an income of $53,637 for railway cars after $181,436 operating expenses and $13,763 taxes.

Coach revenue was $65,944 and net income $9,323, the best showing since buses have been operated by the company. Bus deliveries are being hurried in an effort to bring the coach capacity of the company up to size sufficient to make possible the establishment of the new Franklin Avenue line which will replace the Bancroft Belt line, to be abandoned.

After heavy maintenance charges there was a net surplus of $2,355 for the stabilizing fund compared with a deficit of $44,765 for the corrresponding month a year ago.

Cars and coaches carried 4,211,404 passengers. This was an increase of 500,000. Service was increased and operating expenses rose, due to larger proportion of motor coach service.

The influenza epidemic hit Toledo in the midst of the Christmas shopping period and cut into railway revenues in early December at a rate of $1,000 a day. At one time, as many as 150 employees of the company were on leave due to sickness.

$3 Basis in Cincinnati

The Cincinnati Street Railway, Cincinnati, Ohio, has placed its $50 par capital stock on a $3 annual dividend basis against $2.50, previously paid. The company declared a dividend for October at the former annual rate of 5 per cent and for November and December at the new rate of 6 per cent, payable Jan. 1, to stock of record Dec. 24.

More Valuable Rights for Montreal Holders

Following a meeting of the board of Montreal Tramways, Montreal, Que., it was announced the company will issue 10,000 additional shares of capital stock of $100 par value, and will offer them at $150 per share to holders of existing stock of record Dec. 21, in the proportion of one share for every six shares held.

The issue of 10,000 shares will bring the outstanding stock of the company up to $7,000,000 and is the third issue of $1,000,000 of stock in the past two years. The treasury will receive $1,500,000 in cash as a result of the financing.

At their meeting the directors also declared the regular quarterly dividend of $2.50 per share on the capital stock.

3,000,000 More Ride on Chicago Surface Lines Than a Year Ago

Riding on the Chicago Surface Lines has continued to increase and November shows a total increase over a similar month last year of 3,032,039 rides. The 134,285,240 rides, including transfers, exceeded the previous high November riding, 1926, by 2,933,370 rides. Revenue rides were 74,402,575, an increase of 723,876 over November, 1926, and of 1,041,735 over November last year.

Gross receipts during the month were $5,137,094, an increase over 1926, the previous high November, of $50,627.

Expansion by Georgia Power

Two utilities in Augusta, Ga., were recently taken over by the Georgia Power Company and will be operated as an integral part of that system. They are properties of the Augusta-Aiken Railway & Electric Corporation and the Georgia-Carolina Electric Company. With the announcement of the acquisition, it was stated that F. B. Culley, vice-president and general manager of the Augusta-Aiken Company, will continue in charge with the title of division manager of the newly created Augusta division of the Georgia Power Company. The utilities involved in the new expansion of the Georgia Power supply, besides electric light and power, railway service in Augusta.

This purchase followed close upon that of the Macon Railway & Light Company, Macon.

P. S. Arkwright, president of the Georgia Power Company, said that the closer alliance now effective between the Georgia Power Company and the Augusta utilities should prove of great advantage to both companies.

New York Traffic Figures Released

For fiscal year ended in June 2,921,200,000 passengers rode rapid transit and street surface lines. Bus and tube traffic swell total to 3,235,200,000

PASSENGERS numbering 3,235,200,000 were carried on the rapid transit lines, the Hudson tubes, the street surface lines and the bus lines during the fiscal year ended June 30, 1928. Rapid transit and street surface lines in New York City carried 76,700,000 more passengers during the fiscal year ended June 30, 1928, than they carried during the preceding fiscal year. Total number of passengers carried on the rapid transit and street surface lines in New York City for the fiscal year just ended was 2,921,200,000. The increase in percentage was 2.7 per cent over the preceding fiscal year. In addition, the Hudson & Manhattan Railroad carried 112,500,000 passengers, and the bus companies reporting to the Transit Commission carried 86,100,000.

It is estimated that the traffic carried by the municipal bus lines during the fiscal year reached a total of 97,750,000. The Williamsburg Bridge local line carried 17,600,000 passengers. These figures when added give a grand total of 3,235,200,000.

Below is a table showing the percentage of this total carried by the various lines:

	Per Cent of Total Traffic
Interborough Rapid Transit Company	
Subway division	27.75
Elevated division	10.85
Total, Interborough Rapid Transit Company	38.60
New York Rapid Transit Corporation (Brooklyn-Manhattan Transit)	20.70
Total, rapid transit lines	59.30
Street surface lines	31.54
Hudson & Manhattan Railroad	3.48
Bus lines (exclusive of municipal bus lines)	2.66
Municipal bus lines (estimated)	3.02
Total	100.00

Metropolitan Acquisition in Boston

A BILL has been filed in the Massachusetts Legislature for the incorporation of the Metropolitan Transit Company with authority to take over the various transportation lines within the Metropolitan area of Boston. The lines which it is sought to consolidate, under the provisions of this bill, are the Boston Elevated, some of the old Boston & Northern, the Newton Circuit of the Boston & Albany Railroad, and the Boston, Revere Beach & Lynn Railway, recently electrified. Sections of other lines are wanted. A part of the Eastern Massachusetts Street Railway is located in the district.

In the matter of financing it is proposed to create 7,500,000 shares of capital stock of a par value of $10; of this 2,500,000 shares are to be set aside for extensions and improvements; bonds up to $125,000,000 would be authorized.

Appearing as petitioners for this legislation are William J. McDonald, A. H. Kenyon and Elbridge R. Anderson.

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The Interborough Rapid Transit station at Times Square is still the busiest station in the city. A total of 55,093,646 fares were collected there during the last fiscal year, an increase of 6,970,080 over the previous year. Grand Central is the next busiest station. For the fiscal year 1928, 44,371,196 fares were collected at that station, an increase of 4,164,868 over the previous year. The Pennsylvania station of the Interborough stands third on the list with 41,885,547 fares collected, an increase of 3,911,292. The fourth largest station is the Brooklyn-Manhattan Transit station at Times Square, at which 34,630,250 fares were collected for the 1928 fiscal year, an increase of 1,782,250 over the previous year.

The accompanying table shows the ten largest stations on the Interborough and Brooklyn-Manhattan lines with a comparison of the 1928 and 1927 figures.

Four of the stations on the Brooklyn-Manhattan Transit lines show a decrease when compared with the figures of 1927. The explanation offered is that the 1927 figures were slightly abnormal because of the strike on the Interborough lines during July, 1926, which resulted in a shift of passengers to the Brooklyn-Manhattan lines. Thus, if these stations on the B.M.-T. had had only their normal increase for the fiscal year 1927, the figures for 1928 would probably not show a decrease.

The maximum traffic days for the fiscal years ended June 30, 1928, and 1927, on the I.R.T. subway and elevated lines and on the B.-M.T. lines were:

	Fiscal Year Ended June 30 1928	1927
I. R. T. Subway Division		
Dec. 19	3,113,346	
Feb. 21		2,861,217
I.R.T. Elevated Division		
Oct. 24	1,109,003	
July 12		1,227,047
B.-M.T. New York Rapid Transit		
Dec. 19	2,105,989	
July 12		2,095,146

The subway division of the I.R.T. with a traffic of 897,700,000 passengers made the greatest gain during the year, with an increase of 83,100,000 passengers, or 10.2 per cent. The elevated division of the Interborough carried 7,800,000 fewer passengers than during the preceding year. The B.-M.T. lines carried 669,600,000 passengers for the 1928 fiscal year; an increase of 13,000,000 or 2 per cent for 1927. The street surface lines in Manhattan lost nearly 15,800,000 passengers and in Richmond nearly 6,800,000. Bronx street surface lines gained about 8,500,000, Brooklyn gained about 1,650,000, and Queens gained about 750,000.

For the fiscal year ended June 30, 1928, the I.R.T. lines showed an increase in operating revenue amounting to $3,889,206. B.-M.T. lines showed an increase in operating revenue of $693,343. The elevated division of the I.R.T. showed a loss in operating revenue amounting to $456,744. Surface line companies operating in five boroughs showed a decrease of $694,278 in operating revenue for the fiscal year ended June 30, 1928.

Total operating revenues of all street railway lines in New York City amounted to $157,065,000 for the fiscal year 1928, or $3,888,000 more than the preceding fiscal year. Rapid transit lines passed the $100,000,000 mark with total operating revenues of $101,928,000, an increase over the preceding fiscal year of $4,582,000. The street surface lines had a total operating revenue of $55,137,000, a decrease of about $694,000.

Among the Manhattan surface companies, the New York Railways Corporation had the biggest decrease in revenue. That company's shrinkage was $324,369. Street surface companies in Queens reported an increase in operating revenue. The Brooklyn surface companies reported an increase in passenger revenue of $91,000, which was more than offset by the decrease of $99,000 in revenue from freight operations on the South Brooklyn Railway, making the total operating revenues of the Brooklyn surface companies show a decrease of $4,000. Street surface companies in the Bronx, all included in the Third Avenue Railway, reported an increase in revenues of $428,000.

Dividends declared during the fiscal year ended June 30, 1928, were as follows:

By the New York Rapid Transit Corporation on 282,760 shares of capital stock (no par value), $16 per share.

By the South Brooklyn Railway on $500,000 capital stock, 8 per cent.

By the Manhattan Bridge Three-Cent Line on $450,000 in capital stock, 3 per cent.

By the Hudson & Manhattan Railroad on preferred stock, par value, of ap-

TABLE SHOWING DISTRIBUTION OF NEW YORK TRAFFIC

	Fiscal Year Ended June 30 1926	1927	1928
Rapid transit lines			
I. R. T. subway division	784,280,073	814,626,596	897,693,467
I. R. T. elevated division	346,204,574	359,019,660	351,258,534
Total I. R. T. Company	1,130,484,647	1,173,646,256	1,248,952,001
N. Y. Rapid Transit (B.-M.T.)	621,251,881	656,543,693	669,552,744
Total, rapid transit	1,751,736,528	1,830,189,949	1,918,504,745
Street surface lines			
Manhattan	335,663,087	324,297,970	308,590,199
Bronx	133,353,069	144,610,327	153,143,745
Brooklyn	474,872,275	477,348,475	479,002,035
Queens, excluding B.-M.T.	56,868,143	50,949,549	51,691,870
Richmond	16,943,627	17,133,068	10,335,834
Total, street surface	1,017,700,201	1,014,339,389	1,002,763,683
Total, rapid transit and street surface	2,769,436,729	2,844,529,338	2,921,268,428
Hudson & Manhattan Railroad	108,826,762	112,318,329	112,487,043
Bus lines			
Fifth Avenue Coach Co.	69,425,753	70,405,169	67,283,025
Eastern Parkway, Brownsville & East New York Transit Relief Association, Inc.	(a) 7,146,492	9,941,785	9,605,171
Nassau Bus Lines, Inc.	1,369,682	1,479,990	1,345,879
New Drop Beach Bus Service, Inc.	.....	(b) 204,511	331,771
Surface Transportation Corp. of New York	.....	.....	(c) 7,520,571
Total, bus (d)	77,941,927	82,031,455	86,086,417
Grand total (e)	2,956,205,418	3,038,879,122	3,119,841,888
Population (f)	6,131,944	6,217,260	6,302,576
Fares per capita	482	489	495

(a)–(c) Began operation: (a) Aug. 28, 1925; (b) Sept. 3, 1926; (c) Nov. 1, 1927.
(d) Exclusive of figures for the Tompkins Bus Corporation, which are not available at this time.
(e) Exclusive of figures for the Williamsburg Bridge local line and municipal bus lines.
Figures for the fiscal year 1928 were as follows:
Williamsburg Bridge local line 17,635,924
Municipal bus lines (estimated) 97,750,000
(f) Estimated on basis of one-tenth of decennial increase.

SOME OF THE STATIONS OF HEAVIEST TRAFFIC ON NEW YORK RAPID TRANSIT LINES

	1928	1927
Interborough Rapid Transit Company		
Subway division		
Times Square (all entrances)	55,093,646	48,123,566
Grand Central (all entrances)	44,371,196	40,206,328
Pennsylvania Station	41,885,547	37,974,255
14th Street (Fourth Avenue)	24,714,149	22,617,305
Atlantic Avenue (Brooklyn)	17,971,910	16,502,021
Brooklyn Bridge	16,726,080	15,928,952
Fulton Street (Broadway)	15,607,293	14,584,221
50th Street	14,972,058	12,839,957
Borough Hall	14,852,274	13,474,123
14th Street (Seventh Avenue)	13,936,289	13,044,780
Total	260,130,442	235,295,508
Per cent of total traffic on I.R.T. subway	28.98	28.88
New York Rapid Transit Corporation (B.-M.T.)		
Times Square (Broadway Line, Manhattan)	34,630,250	32,848,000
34th Street (Broadway Line, Manhattan)	27,648,533	26,584,878
Union Square (Broadway Line, Manhattan)	22,891,015	22,082,956
Cortlandt Street (Broadway Line, Manhattan)	15,995,383	15,932,040
Chambers Street (Center Street Loop)	15,086,205	14,985,463
Essex Street (Centre Street Loop)	14,974,169	15,606,447
DeKalb Avenue (Fourth Ave. Line, Brooklyn)	12,316,795	12,501,188
Stillwell Avenue (Coney Island)	12,145,722	12,270,952
Park Row (Brooklyn Bridge)	11,475,838	12,269,849
23rd Street (Broadway Line, Manhattan)	11,227,896	11,024,543
Total	178,427,806	176,106,316
Per cent of total traffic on N.Y.R.T.	26.65	26.82

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proximately $5,200,000, 5 per cent, and on common stock, par value, of approximately $40,000,000, 2½ per cent. Hudson & Manhattan Railroad declared interest of 5 per cent on $33,102,000 of adjustment income bonds.

Third Avenue Railway declared interest of 2½ per cent on $22,536,000 of adjustment mortgage bonds.

The Fifth Avenue Coach Company declared a dividend of 1,000 per cent on $50,000 capital stock.

The Eastern Parkway, Brownsville & East New York Transit Relief Association declared dividends of 375 per cent on $28,600 capital stock.

The accompanying table shows the number of passengers carried on rapid transit and street surface lines during the years 1928, 1927 and 1926; also the number of passengers carried by the Hudson & Manhattan Railroad (part of which traffic is outside of the city limits), the Fifth Avenue Coach Company, the Eastern Parkway, Brownsville and East New York Transit Relief Association, Inc., the Surface Transportation Corporation of New York, and two small bus companies, together with certain other data pertinent thereto.

Illinois Removal Allowed

Authority to discontinue local service between Ottawa and Streator, Ill., and to remove its tracks on this 8-mile line was asked in a petition recently filed with the Illinois Commerce Commission by the Illinois Traction, Inc. The railroad has been operating supplementary motor coach service between the two cities for several months.

A. R. Kuser Resigns in New Jersey

Col. Anthony R. Kuser, a director of Public Service Corporation of New Jersey since its formation in 1903, has resigned from the corporation and subsidiary companies as a director, due to ill health. He was also a member of the executive committee. Colonel Kuser was one of the original 24 directors of the corporation on its organization in June, 1903. He was also at that time made second vice-president, and continued as a vice-president until 1923 when he resigned, retaining his position, however, on the directorate.

Abandonment on Northeastern Lines Deferred

Hearings were completed before the New Hampshire Public Service Commission on Dec. 19, regarding the abandoning of railway lines in Salem, N. H., by the Massachusetts Northeastern Street Railway. Counsel for the town of Salem has been allowed until Dec. 29 to file a brief and the Northeastern will have an additional five days to answer it. Although initially the railway had planned to cease operations on these lines on Dec. 26, the date for suspension was put off until after Jan. 1.

Clifton L. Bartlett, vice-president, stated at the hearing that the company had lost $150,000 in Salem during the past ten years. Prospects, he said, did not look bright for improving revenues, and $60,000 would have to be spent to make the tracks reasonably safe.

Town Counsel Chester T. Woodbury spoke for a continuation of the Salem lines. He said that many people who lived in Salem, N. H., worked in Lawrence and Haverhill and required the transportation.

Separation in Dallas

Separation of the Dallas-Terrell interurban railway from other operations of the Texas Electric Railway has been effected with the granting of a state charter to the Dallas-Terrell Interurban Railway. Capital stock in the company consists of 90,000 shares with no par value.

Incorporators are: W. B. Head, John W. Carpenter and Richard Meriwether, Dallas, all executives of the Texas Electric Railway. The officials and directors of the two companies will remain the same, however, and ownership of stock in the new company is vested with the Texas Electric Railway. The action was taken to facilitate operation.

$65,155 Loss on Interborough for Five Months

For the five months' period ended Nov. 30, 1928, gross revenue from *all* sources of the Interborough Rapid Transit Company, New York, N. Y., was $27,468,408, which represented an increase of $781,673 over a similar period of 1927. Expenditures for operating and maintaining the property totaled $17,531,504, or an increase of $1,595,850 for the five months' period ended November, 1927. The balance, after deducting the 5 per cent Manhattan dividend rental, was a deficit of $65,155, compared with a net profit of $233,181 in the five months ended Nov. 30, 1927.

Final Accounting for Shore Line Accepted

The final accounting of Receiver Robert W. Perkins for the Shore Line Railway was accepted on Dec. 19 by Judge John Richards Booth in the Superior Court at Norwich, Conn. Judge Booth ordered the sum of $185,000 turned over to the Old Colony Trust Company, Boston, Mass. A balance totaling $8,083 is to be held by the receiver to await further jurisdiction by the court. An unsettled claim against the Shore Line Railway has yet to be considered. Action is pending in this case on a petition by the Westinghouse Company, which seeks judgment to the amount of $6,500 against the defunct railway.

Date of Puget Sound Sale Set

Feb. 25 has been set as the date of sale of the operating properties of the Puget Sound Electric Railway, which runs the Seattle-Tacoma-Renton Interurban lines. Bids will be received until the date of sale.

Conspectus of Indexes for December, 1928

Compiled for Publication in ELECTRIC RAILWAY JOURNAL by

ALBERT S. RICHEY

Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Last 5 Years High	Last 5 Years Low
Street Railway Fares* 1913 = 4.84	Dec. 1928 7.71	Nov. 1928 7.69	Dec. 1927 7.57	Dec. 1928 7.71	May 1923 6.88
Electric Railway Materials* 1913 = 100	Dec. 1928 145.5	Nov. 1928 145.1	Dec. 1927 140.6	April 1923 175.3	Feb. 1928 139.5
Electric Railway Wages* 1913 = 100	Dec. 1928 229.8	Nov. 1928 229.9	Dec. 1927 228.4	229.9	March 1923 206.8
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Dec. 1928 205.1	Nov. 1928 205.7	Dec. 1927 200.7	March 1924 206.8	Jan. 1923 187.3
Eng. News-Record Construction Cost (General) 1913 = 100	Dec. 1928 210.2	Nov. 1928 209.5	Dec. 1927 203.9	March 1924 224.7	Nov. 1927 202.0
U.S. Bur. Lab. Stat. Wholesale Commodities 1926 = 100	Nov. 1928 96.7	Oct. 1928 8	Nov. 1927 96.7	March 1923 104.5	April 1927 93.7
Bradstreet Wholesale Commodities 1913 = 9.21	Dec. 1928 13.15	Nov. 1928 13.01	Dec. 1927 13.53	Dec. 1925 14.41	July 1924 12.23
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Nov. 1928 157.3	Oct. 1928 156.8	Nov. 1927 156.5	Nov. 1925 167.1	May 1924 141.0
Cost of Living Nat. Ind. Conf. Bd. 1914 = 100	Nov. 1928 162.6	Oct. 1928 162.0	Nov. 1927 164.2	Nov. 1925 171.8	Feb. 1923 157.5
Industrial Activity Elec. World—Kw.-hr. used 1923-25 = 100	Nov. 1928 135.0	Oct. 1928 132.0	Nov. 1927 115.2	Nov. 1928 135.0	July 1924 73.4
Bank Clearings Outside N. Y. City 1926 = 100	Nov. 1928 104.0	Oct. 1928 105.1	Nov. 1927 100.2	May 1928 108.4	Aug. 1923 81.6
Business Failures Number	Nov. 1928 1564	Oct. 1928 1664	Nov. 1927 1656	Jan. 1924 2231	Sept. 1928 1348
Liabilities (Millions)	52.07	41.24	41.62	122.95	22.11

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

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Personal Items

W. G. Murrin Prepared for New Post

When George Kidd gives over the reins on Jan. 1 next to W. G. Murrin, another progressive and energetic man will hold the chief executive post connected with the British Columbia Electric Railway in Vancouver, B. C., and will likely carry on the expansion policy which characterized the service period of his predecessor and friend, both of whom, English born, found themselves in Canada in their early youth, ambitious to make their way. Mr. Kidd becomes chairman of the board of the holding company.

Back in 1903 Mr. Murrin was connected with the London Electric Lighting Company, remaining with that company until 1912, simultaneously holding the office of works manager of the London United Tramways. In 1913 he went to the Canadian property as mechanical superintendent with a reputation for resourcefulness and accomplishment which soon won for him the position of superintendent, assistant general manager and later vice-president.

W. G. Murrin

He is known as a hard worker and has also a large capacity for relaxation and social intercourse. His interest in his work is intense, but he also knows the value of an avocation, giving his attention to the Little Theatre Movement in Vancouver, as president.

Trained as an engineer and copiously endowed with experience in the operation of hydro-electric enterprises and the management of light, heat, power and tramway undertakings, Mr. Murrin, at 53, becomes president of one of the biggest enterprises in Western Canada.

Technical Journalist Joins Bendix Corporation

David Beecroft, associated with the Chilton Class Journal Company and the Class Journal Company for 24 years, resigned on Dec. 1, 1928, to become vice-president in charge of the newly-established New York office of the Bendix Corporation. For more than eighteen years he was connected with the editorial department of the Class Journal publications, beginning with *Motor Age* in 1905 and acting as directing editor of all the Class Journal publications until his withdrawal from the editorial department in 1922.

Mr. Beecroft entered the motor vehicle industry in December, 1903, as editor of the *Automobile Review*, published weekly in Chicago, but in March, 1905, he joined the staff of *Motor Age* as technical editor and in 1908 editor.

In 1911, in addition to his editorial work on *Motor Age*, he took on the editorial work of *The Automobile*, later converted into *Automotive Industries*, and in 1913 became directing editor of the Class Journal Company, then also publishing *Motor World* and *Commercial Vehicle*. In January, 1917, he established *L'Automobile Americano* and an automobile export paper printed in Spanish.

In November, 1923, he entered the business department of the Class Journal Company. During the past two years he has devoted all of his time to studies in the automobile field, particularly market analysis.

Mr. Beecroft was president of the Society of Automotive Engineers during 1921 and previous to that he was a member of the board for several years. He was chairman of the papers committee of the society for five years.

At present he represents the American Automobile Association on the motor vehicle conference committee and has been a member of the contests board of the American Automobile Association for twenty years. Mr. Beecroft has also been active in the work of the trade paper associations.

The Bendix Corporation owns and operates the Bendix Brake Company, South Bend, Ind., and controls and operates the Eclipse Machine Company, Elmira, N. Y. Mr. Beecroft's office will be located at 2837 Grand Central Terminal Building.

ARTHUR G. WADLEIGH, Lynn, and Fred J. Crowley, Lowell, have been reappointed by Governor Fuller to the Board of Public Trustees of the Eastern Massachusetts Street Railway, Boston, Mass.

ROBERT A. PRITCHARD, vice-president of the J. G. White Management Corporation, has succeeded James H. Pardee as president of the Equitable Coach Corporation, which has secured bus rights for Brooklyn and Manhattan from the Board of Estimate and is reported now to be in a deal under which it will be included in a new company that will take over its rights and fit in the new operation with that of the surface lines of the Brooklyn-Manhattan Transit Corporation.

Honor for Wilhelm Stein

Wilhelm Stein, manager of the Hamburg Elevated Railway, has just received the degree of Doctor of Engineering, from the Hanover School of Technology. The degree was awarded *honoris causa*. Dr. Stein is vice-president of the German Co-ordinated Transport Association and a member of the executive committee of the International Tramway & Bus Association, with headquarters in Brussels, Belgium.

Dr. Stein was born Sept. 5, 1870, and studied mechanical engineering at both the Hanover School of Technology and in Berlin, later receiving the degree of Regierungsbaumeister. In 1897 he became associated with the Siemens & Halske Company of Berlin, and in 1898 was asked by that concern to supervise the construction of equipment of the Hamburg Elevated Railway. On its completion he was appointed general manager. After the elevated railway was consolidated with the surface lines and other means of public transport in Hamburg and became a municipal property, Dr. Stein was appointed manager of the entire system.

Wilhelm Stein

In 1926, he visited the United States and made an extended inspection trip of the electric railways and transportation facilities in this country.

HARLEY A. JOHNSON, general manager of the Chicago Rapid Transit Company, Chicago, Ill., has been spending the last two months in Europe studying heavy electric traction installations. He has been doing so as chairman of the sub-committee on European practice of the electrification of steam railroads committee, of the National Electric Light Association. Three other members of the committee accompanied him: Reinier Beeuwkes, electrical engineer of the Chicago, Milwaukee, St. Paul & Pacific Railroad; Louis E. Fischer, vice-president of the Illinois Power & Light Corporation, and Horace H. Field, secretary of the electrification of steam railroads committee of the National Electric Light Association. The party sailed from New York on Oct. 27, 1928, and expected to return from Southampton on Dec. 27, 1928. Their itinerary included England, Sweden, Germany, Switzerland, Italy and France.

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Annual Construction Programs Announced

Tennessee Electric Power will spend $470,000 on railways. Portland Electric Power Company to make large expenditures. One hundred and six cars for Montreal

IN CONTEMPLATION of a generally sustained commercial and industrial activity during the coming twelve months, the Tennessee Electric Power Company, Chattanooga, Tenn., and its subsidiary companies will spend the sum of approximately $5,000,000 on new construction work during 1929. This new program is equally as large as that appropriated for the current year. Construction activities of this company for the past five years have amounted to $25,000,000. The new estimate will run the total to $30,000,000 by the end of 1929.

As in former years, the greater portion of the construction budget authorized by the management will be expended on the electrical division of the property for new and additional power facilities, and for improvements and betterments in service. This amount will be around $4,500,000 including the Nashville property. Expenditures for the street railway department in Nashville and Chattanooga will total $470,000. The remainder will be utilized by the water, ice, and telephone division for general business requirements.

A number of service improvements will be made at the power houses, including the installation of temperature recording apparatus on each of the fourteen generators. Mica insulated windings will be provided for two of the present 4,200 hp. generators, thereby increasing the hp. rating of each, 2,000.

The Portland Electric Power Company has announced expenditures of $15,850,000 for the next year, $2,000,000 of which will go into new construction. A large part of this will be spent in extending the lines of the company and in additions to power plants and substations. $400,000 will be spent for railway improvements and about $1,500,000 for substation improvement and extensions.

Cars for Montreal

The purchase of 106 cars by the Montreal Tramways Company, Montreal, Que., has been authorized by the Montreal Tramways Commission. These cars to be ordered from the Canadian Car & Foundry Company will consist of 50 two-man cars similar to the last group of cars received, 30 one-man cars similar to the present class 1950, 20 one-man cars with draw bars fitted at the front end to permit each car to be used as a trailer and hauled by any of the 2100 class cars, and 6 double-end one-man, two-man cars with platforms arranged for double end operation with either one man or two men. The company will order 30 more of the one man type 1950 cars, if the present coupling plan works out satisfactorily.

The Chicago South Shore and South Bend Railroad, Michigan City, Ind., is installing two new freight switching connections, one at Burnham, Ill., and the other at Shearson, Ind. At Burnham, a new main line track for West Farm trains will be built to the north of the present double track and main line. The former east bound main track will then become a yard track with two additional yard tracks paralleling it to the south, also 1,500 ft. of tail track. The yard when completed, about March 1, will run 5,500 ft. west of the state line at Hammond to Burnham, and will greatly facilitate the handling of increasing carload shipments by the Belt Railway.

At Shearson, Ind., a new single receiving track, connecting with the Indiana Harbor Belt Railroad, is being built. This track is going in south of the main line for a distance of 2,000 ft. It will be used as a new receiving track, the present interchange going over to delivery only. Seventy lb. rail is being laid on treated ties. Construction work on the New York Central connection at South Bend, and the Michigan-Central Monon route interchanging at Michigan City, is virtually finished.

The railway project for Mount Hood in Oregon is still under consideration, the latest development being when J. L. Meier of Portland, chairman of the special committee, personally delivered to the Secretary of Agriculture at Washington, D. C., an answer from Portland interests. This was a reply to the secretary's decision postponing action of any definite nature on this proposed project. The Portland committee is trying to speed up a favorable and early reaction to the plan for the railway.

The Pacific Electric Railway, Los Angeles, Cal., has placed an order with the Union Switch & Signal Company for alternating current, automatic block signalling material to be installed on the Pasadena Short Line between Indian Village and Newton Park, Cal. This installation will comprise 34 color light signals, 56 impedance bonds, 55 relays with the necessary transformers, reactors, copper oxide rectifiers and housings. New 122-lb. rail has been installed by the East St. Louis Railway Company, East St. Louis, Ill., on Collinsville Avenue from Missouri to Illinois Avenues. The rail joints were thermit welded, and ready mixed concrete was delivered to the job by trucks. The cost of the complete installation was approximately $25,000. The Toronto Transportation Commission has recently purchased land for the construction of a loop on the east side of Mutual Street, just North of Queens Street, Toronto.

During the year 1928 the Worcester Consolidated Street Railway, Worcester, Mass., completed 14,000 ft. of track. In this work there was used 420 tons of 7-in. girder rail, 14,500 ties, 15,000 tie plates, and 3,500 flat tie rods. There were special work renewals in 22 locations in various parts of the city, at an expenditure of about $35,000.

Building Construction

The St. Louis Public Service Company, St. Louis, Mo., will build an addition to its mechanical shop and operating building, to cost $45,000. The Iowa Railway & Light Corporation, Cedar Rapids, Iowa, plans on operating a building at Marshalltown, Iowa, to cost about $70,000. A railway company in northern New York State has purchased transformers costing $30,000.

It is reported that a model town is being laid out on the bank of Flin Flon Lake, Manitoba, about 3 miles from the Flin Flon Mine, and that it is proposed to build an electric railway from the town to the mine, for the convenience of the company's employees. The Montreal Tramways Company has prepared plans for the construction of a viaduct at Atwater Avenue, across the Canadian National Railway tracks, for electric railway traffic only. This company is building approximately 2.25 miles of track in various locations, and is contemplating the construction of approximately 2 additional miles.

The Nova Scotia Light & Power Company, Halifax, Nova Scotia, is building a single track extension, 1,494 ft. in length. The Ottawa City Counsel, Ottawa, Ont., has let a contract for the construction of a viaduct at Somerset Street, at a cost of $119,025. The City Counsel has discussed the raising of about $145,000 to pay the cost of the structure, including the cost of sidewalks, land damages, etc. The Ottawa Electric Railway is to pay 60 per cent of the viaduct's cost.

Los Angeles Railway, Los Angeles, Cal., has placed orders for two twin

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coaches and one White 29-passenger single-deck treadle door motor coach for use on its lines. The Pacific Electric Railway and the Los Angeles Railway have each ordered three twin coaches, making a total of six to be placed in service on the Western Avenue lines of the Los Angeles Motor Coach Company. The Alabama Power Company, Birmingham, Ala., has completely rebuilt one of its 56-passenger cars. It is equipped with new trucks, electric heaters, air brakes, and all other equipment was thoroughly overhauled.

The three-story brick building used as a carhouse, repair shop and paint shop, at Jamestown, N. Y., by the Jamestown Street Railway Company and the Jamestown, Westfield and Northwestern Railroad has been practically destroyed by fire and the loss was placed at close to $80,000. Three street cars were consumed in the blaze, one a large center entrance interurban unit and two city-type cars.

U. S. World Trade Increasing

The foreign trade of the United States is forging ahead steadily, according to the quarterly report on the value and volume of the principal exports and imports between the United States and its chief foreign markets, issued by the foreign commerce department of the Chamber of Commerce of the United States. The general expansion of this country's foreign commerce is now indicated clearly by a comparison of the statistics for the January-September period of 1928 with the average of the same nine months from 1923 to 1927. The foreign trade of the United States for the first three quarters of 1928 totaled $6,628,000,000, nearly 5 per cent greater than the average of the five corresponding nine-month periods of 1923 to 1927.

Exports amounting to $3,559,000,000, the largest since 1920, is 1.4 per cent above 1927 and 8 per cent over the above mentioned average. Imports amounting to $3,070,000,000, though 2.7 per cent below the 1927 total, were still 1.5 per cent above the 1923 to 1927 average receipts. While exports for the third quarter of 1928 exceeded $1,000,000,000 for the seventeenth consecutive quarter, imports for the quarter fell below $1,000,000,000 for the first time since 1924. Exports of foreign merchandise (re-exports), included with total exports, amounted to $76,037,000 or $4,830,000 lower than last year. Owing to a heavy demand for gold by countries which were placing their currencies on a gold basis, exports of that metal in the January to September period of 1928 were especially heavy, totalling $535,216,000 as against imports of $100,026,000.

Exports of finished manufactures have shown a steady increase from the $1,120,000,000 total for the first three quarters of 1923 to $1,668,000,000 for the nine months of 1928, a gain of almost 50 per cent. Compared with 1927, this group shows a gain of nearly 11 per cent and was 25 per cent above the 1923-1927 average. Finished manufactures constitute nearly 48 per cent of the total exports, a proportion exceeded only in 1916 during the World War.

Exports of semi-manufactures increased from $417,911,000 in 1923 to $537,615,000 in 1928, a gain of 28 per cent. Their gain over 1927 was less than 2 per cent, though 13 per cent above the 1923-27 average. To these two groups of manufactured goods is due largely the extraordinary expansion of the United States export trade.

The course of the crude material group has been uneven with a decided upward trend from 1923 to 1925, and then a severe decline in 1926. In the last three years, however, this group has varied little, the 1928 figures being 2 per cent below the 1923 to 1927 average. Imports of raw materials by value were 9.6 per cent lower than a year ago and 4 per cent lower than the average of the previous five years. Imports of finished manufactures continue their advance and were 10 per cent above the average.

Perhaps the most striking example of the expansion of exports of manufactures is the continued increase in exports of automobiles, parts and accessories, the total value of which increased 77 per cent as compared with the average for the past five years, and was above the record set last year. Machinery exports, lead by industrial machinery, showed an increase in value of 12 per cent above 1927 and 33 per cent above the 1923 to 1927 average. Electrical machinery and apparatus, 4 per cent above 1927, was 16 per cent above the average. The value of exports of metals was up 5 per cent over last year, shipments abroad of semi-manufactures of iron and steel advancing 3 per cent, steel mill products 8 per cent and advanced manufactures of iron and steel 7 per cent. Exports of non-ferrous metals increased over 4 per cent.

Export of railway cars, although not one of the important exports, showed a considerable gain over 1927. Freight cars exported from January to September, 1928, numbered 2,279 as compared to 2,085 in the same period during 1927, or a gain of 9.3 per cent. The number of passenger cars exported during the three quarters of 1928 was 320 as compared to 215 exported during the same period in 1927, making a gain of 48.8 per cent.

Weekly Business Conditions

Steel plants showed lessened activity during the week ended Dec. 22, as compared with the preceding week, but were almost 20 per cent more active than a year ago, according to the weekly statement of the Department of Commerce. The volume of money turnover, as indicated by check payments, was greater than in either prior period. Employment in Detroit factories, indicating the activity of the automobile industry, was seasonally smaller than in the preceding week but showed a substantial gain over the same period of 1927. Petroleum output during the last reported week showed gains over both periods. Lumber production, however, showed declines from both the preceding week and the same period of last year. Bituminous-coal production, on the other hand, though declining from the previous week, was greater than a year ago.

The general index of wholesale prices was slightly stronger than in the preceding week, being still somewhat higher than a year ago. Prices for iron and steel showed no change from the previous week but were higher than a year ago. Copper prices, showing no change from the previous week, were considerably higher than for the same period last year.

Loans and discounts of federal reserve member banks showed only slight change from the previous week but were higher than a year ago. Interest rates on time money averaged higher than in either the preceding week or in the same period of last year. Prices for stocks recovered from the level of the preceding week. Bond prices, reflecting higher interest rates, were still lower than in either the preceding week or the same period of 1927. Business failures were less numerous than in either the previous week or the same period of 1927.

Weekly Business Indicators

(Weeks ended Saturday. Average 1923-25 = 100)

	1928				1927			
	Dec. 22	Dec. 15	Dec. 8	Dec. 1	Dec. 24	Dec. 17	Dec. 10	Dec. 3
Steel operations	105.3	107.9	110.5	109.2	88.0	83.0	80.0	87.0
Bituminous coal production	.....	113.1	115.0	101.6	100.7	100.4	99.4	92.9
Lumber production	.....	90.0	92.3	80.9	88.2	102.3	104.5	102.3
Petroleum production (daily average)	.....	122.3	121.0	120.3	116.8	118.0	119.4	119.1
Freight-car loadings	.....	.....	102.7	93.8	86.5	90.5	91.5	95.5
Building contracts 37 states (daily average)	105.5	101.6	106.0	171.2	121.1	124.9	142.9	102.4
Price iron and steel, composite	87.5	87.5	87.3	87.3	84.8	84.8	84.8	85.0
Copper, electrolytic, price	.....	114.5	114.5	114.5	100.0	99.3	100.8	100.0
Bank loans and discounts	.....	130.3	131.0	130.1	122.9	122.4	122.2	121.7
Interest rates, call money	178.8	190.9	218.2	181.8	103.0	97.0	103.0	100.0
Business failures	120.6	123.3	110.1	102.5	122.4	123.6	122.6	110.6
Interest rates, time money	188.6	177.1	168.6	160.0	97.1	97.1	97.1	97.1
Federal reserve ratio	83.2	82.8	83.6	84.1	86.7	89.3	91.2	91.9

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Cincinnati Car Offers New Line of Industrial Locomotives

The Cincinnati Car Corporation, Cincinnati, Ohio, now offers to users of industrial haulage and switching equipment a complete line of industrial locomotives in gasoline, gasoline-electric, Diesel, electric trolley and storage battery types, known as the Cincinnati line.

These locomotives will be furnished in a variety of sizes from small 2 and 3-ton units up to 50-ton, or larger, and in various track gages, affording equipment suitable for handling either small or large industrial cars in all kinds of service, as well as for switching railroad cars, for which a pronounced demand has developed among shippers and receivers of carload freight, as well as among the steam railroads for use in small terminals on short divisions.

The company has been building electric trolley type locomotives of various sizes for years and many of the proven features of design in this type are incorporated into the additional types, particularly the gas-electric. Different features of design otherwise are based on the experience of a part of its present organization extending over 15 years in the gasoline locomotive field, and involve the most up-to-date mechanical and construction ideas and principles. Ruggedness, ample power, simplicity and accessibility are the prime features sought throughout all of the different types and models.

H. R. Sykes, who is one of the pioneers in the development, manufacture and sale of industrial locomotives, and who is well known to many of the locomotive using public, will be in charge of sales and service of the locomotive division.

Two of its popular size gasoline-powered locomotives will be exhibited at the coming show of the American Road Builders' Association at Cleveland in January.

Welded Chain Simplification Ready for Acceptance

The division of simplified practice of the U. S. Department of Commerce has sent copies of the proposed simplified practice recommendation, for welded chain, to manufacturers, distributors and users of this commodity for acceptance. This recommendation was approved at a general conference of all interested elements in the industry, held under the auspices of the division of simplified practice at the Department of Commerce on Nov. 15.

The simplified list of sizes and varieties is based on a careful survey of existing conditions and requirements in the industry. When the recommendation has been accepted by the industry as a whole, it will become effective for new production on Feb. 1, 1929, subject to annual review thereafter. A standing committee representing all interests was appointed at the general conference. This committee will review the project one year after the effective date, and will then either reaffirm the recommendation for another year, or modify it to meet changed conditions or new developments in the industry.

METAL, COAL AND MATERIAL PRICES F. O. B. REFINERY

	Dec. 26, 1928
Metals—New York	
Copper electrolytic, cents per lb	16.025
Copper wire, cents per lb	18.125
Lead, cents per lb	6.5
Zinc, cents per lb	6.7
Tin, Straits, cents per lb	49.875
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.375
Somerset mine run, f.o.b. mines, net tons	1.875
Pittsburgh mine run, Pittsburgh, net tons	1.80
Franklin, Ill., screenings, Chicago, net tons	1.425
Central, Ill., screenings, Chicago, net tons	1.15
Kansas screenings, Kansas City, net tons	1.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$5.5
Weatherproof wire base, N.Y., cents per lb.	18.75
Cement, Chicago net prices, without bags	2 05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.4
White lead in oil (100-lb. keg), N. Y., cents per lb	13.2
Turpentine (bbl. lots), N. Y., per gal	0.66

ADVERTISING LITERATURE

South Bend Lathe Works, South Bend, Ind., has issued a new booklet No. 23, describing the new model 9-in. junior South Bend back-geared screw cutting lathe, showing a variety of sizes and drives. In this booklet is shown for the first time the new horizontal motor drive which is fully illustrated and described. Aside from the complete description of these lathes, the catalog contains a number of detailed illustrations, showing the practical jobs which may be executed with this new model. A copy of this booklet will be mailed postpaid to anyone desiring it.

St. Louis Car Company, St. Louis, Mo., has issued a catalog, No. 106, illustrating the new Birney car. The features of this car, and the new Type B.A. 50 double-truck used, are shown by detailed pictures and drawings. Aside from a complete description of the features of the car, this catalog contains full specifications of all the equipment used.

Chausse Oil Burner Company, Elkhart, Ind., has issued circular No. 14, descriptive of Chausse oil burning concrete mixers, heaters and kerosene torches. Other equipment described in this bulletin includes portable asphalt plants, tar kettles, tool heaters, oil burning surface heaters and self-heating smoothing irons.

Barrett, Haentjens & Company, Hazleton, Pa., has issued a new pamphlet, describing a method used to make suction lift centrifugal pumps automatic. This bulletin, while dealing with but one automatic pumping system, is of rather general interest since this is the system most commonly used. It shows how the centrifugal pump can be started and stopped by a float switch, push button, pressure regulator, or time switch. It explains the way in which the pump is primed, and describes the several devices used to protect the pump and electrical equipment against damage due to loss of prime, suction air leaks, a broken discharge pipe, and many other adverse operating conditions.

General Electric Company, Schenectady, N. Y., has issued bulletin GEA-971, descriptive of the gas-electric railway car. This bulletin contains illustrations, operating charts and tables, and a detailed description of this type of car. Other bulletins recently issued by this company include GEA-408A, describing electric heating equipment for industrial ovens; GEA-876B, describing the type WD-400-A arc welder; GEA-874C, describing type WD-200A arc welder; GEA-569B, describing potential arc welding sets; GEA-881A, describing General Electric arc welder, gas-engine driven; and GEA-878 which contains a description of a testing set for railway circuit breakers.

Stuebing Cowan Company, Cincinnati, Ohio, in collaboration with railroad representatives, Leeds, Tozzer & Company, New York, N. Y., has just issued an interesting pamphlet entitled "Straight Line Trucking" which describes the use of the lift truck platform system by railroads and other common carriers.

Wagner Electric Corporation, St. Louis, Mo., has just issued a new 52-page catalog describing Wagner distribution transformers in single-phase and three-phase, pole-type and subway-type, in ratings up to and including 500 kva.

TRADE NOTES

Synthane Corporation, in September, 1928, under the laws of Delaware, is completing the building of its plant at Oaks, near Philadelphia, Pa., and expects to commence production of Laminated Bakelite products in the early spring. R. R. Titus, formerly vice-president and general manager of the Diamond State Fibre Company and the Celeron Company of Bridgeport, Pa., heads the corporation as president, with J. B. Rittenhouse as vice-president and George J. Lincoln, secretary and treasurer.

Wagner Electric Corporation, St. Louis, Mo., announces the addition of R. L. Matthews to the sales force of its Chicago branch office.

Hisey-Wolf Machine Company, Cincinnati, Ohio, manufacturer of electric drills, grinders and buffers, has recently opened a branch office at 549 West Washington Boulevard, Chicago, Ill. The office will be in charge of Roy D. Haworth, who will be a direct representative.

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Electric Railway Journal

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(Published in London)

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CHANGE OF ADDRESS
Subscribers are requested to send both the old address and the new address when they move to a new address.
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1928
Advertising Index — Alphabetical, 48; Classified, 44, 46, 48; Searchlight, 43.

Vol. 72, No. 26 *Pages 1105-1142*

December 29, 1928

In This Issue

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"The Greatest Law Suit in History"—There Is Danger in the Lure of New Business—Ten Years of Service at Cost in Rochester—Ideals Flow Through Channels of Human Contact—Alert Management Succeeding Even in Small Communities—Brooklyn Bus Settlement in Sight—Regulation Essential for Taxicab Stability

Continued Improvement Shown at Greenfield 1108

Conclusive evidence of the need for public transportation systems in small communities is furnished by the experience of the Greenfield & Montague Transportation Area, related in this article.

Modern Problems of Motor Coach Design Demand an Open Mind 1113

BY G. A. GREEN

The author explains some of the design and manufacturing problems with which the motor coach engineer is confronted and accounts for the wide discrepancy in motor coach and automobile performance.

New Express Passenger Electric Locomotive in Japan 1119

Details of one of the seven 1,800-hp. high-speed passenger locomotives to be used in express service on the 100-mile line of the Japanese Government Railways between Tokio and Kosu are given.

National Bus Regulatory Bill Introduced 1121

The full text of the new Parker Bill, revised somewhat to overcome the objections of the law proposed last year, and now before the present session of Congress for consideration, is published herewith.

Track Reconstructed Using Both Steel and Wood Ties 1111

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Practical Ideas for the Maintenance Man 1125

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Transportation Report in St. Louis—Developments Proposed for Cleveland—New Orleans Car Rider Favored—100 Per Cent Operation for Five Days in Chicago—2,921,200 Passengers in New York—Bondholders Object to Chicago Plan

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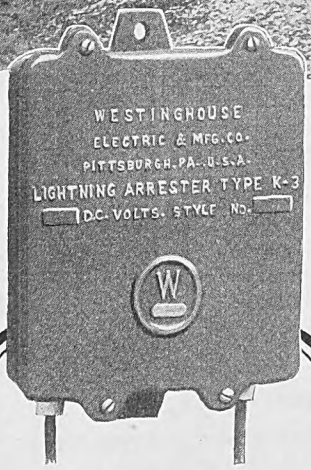
One of the modern cars of the Pittsburgh Railways Company, passing a block signal protected by Westinghouse K-3 Arresters.



Protecting Signal Equipment on the Pittsburgh Railways

THE Pittsburgh Railways Company, Pittsburgh, Pa., winner of the Coffin medal in 1925, has found the Westinghouse K-3 direct-current lightning arrester most desirable for the protection of its automatic block signal system and car equipment.

The K-3 arrester gives positive protection against surges induced by lightning.

Years of field service with thousands of installations prove this arrester to be without an equal.

This arrester requires very little maintenance as it has no liquids to freeze or plates to deteriorate.

It is simple and effective in operation, and consists chiefly of a condenser with or without spark gap.

The K-3 arrester is designed for line, car, and station protection on 100 to 1500-volt direct-current circuits.

Mr. N. C. Towle, Transp. Division
Westinghouse Electric & Mfg. Co.
Pittsburgh, Pa.

Dear Mr. Towle:

. . . . We have found the K-3 arrester quite satisfactory in the protection of automatic signals, and also for the protection of the equipment on our cars. The maintenance cost is practically negligible. . . . .

Yours very truly,
The Pittsburgh Railways Co.
A. H. Leschke
Operating Engineer.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in all Principal Cities of the United States and Foreign Countries

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA 1928

Westinghouse

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If "X" = 75 to 100 Feet

The ZP Special, an incandescent headlight for city service projects a well diffused light by reason of its prismatic glass reflector. 8⅝ in. convex lens of heat resisting glass. Armco iron case and door. Recess mounted, Page 53, Supp. No, 2, to O-B Cat. No. 20.

If "X" = 300 to 500 Feet

The Type WDF is a recess mounted incandescent headlight for city and suburban service. Either crystal or gold ray glass or nickel-plated copper reflector. 8⅝ in. lens. Armco iron case with either lock or spring catch. Page 735, O-B Cat. No. 20.

DOLLARS AND SENSE

X

If "X" = 800 to 1000 Feet

The Type SDP is a portable incandescent headlight for ordinary interurban service. 12-in. parabolic crystal or gold ray glass reflector Uses 56 to 250-watt, 115-volt lamp. Steel case. Also furnished for dash or roof mounting. Page 775, O-B Cat. No. 20.

If "X" = 1200 to 1500 Feet

The Type DCP is a portable. high-speed interurban type incandescent headlight. Uses 500-watt lamp. 11-in. crystal ray glass reflector. Two way focusing mechanism. This headlight is being used to replace many old time Luminous Arc Headlights. Page 755, O-B Cat, No. 20.

What is Your "X" Distance?

THE four O-B Headlights shown above are the selections of many operating men for their particular track illumination problems. Each light has been successfully used for a different specific type of service. Each has demonstrated an ability to provide the "pick-up"—the "X" distance—necessary for the type of service for which it is designed.

How long must your "X" distance be? That dimension will be best served by the O-B Headlight which operators have indicated by their choice for similar track illumination requirements. While atmospheric conditions, voltage variations and the human element vary the distances specified, the selection of an O-B Headlight to properly perform under normal conditions is the best answer to the question, "What is your 'X' distance?"

Ohio Brass Company, Mansfield, Ohio
Canadian Ohio Brass Co., Limited
Niagara Falls, Canada
1008D

Ohio Brass Co.

NEW YORK CHICAGO PHILADELPHIA PITTSBURGH ATLANTA CLEVELAND SAN FRANCISCO LOS ANGELES

PORCELAIN INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING MATERIALS
VALVES

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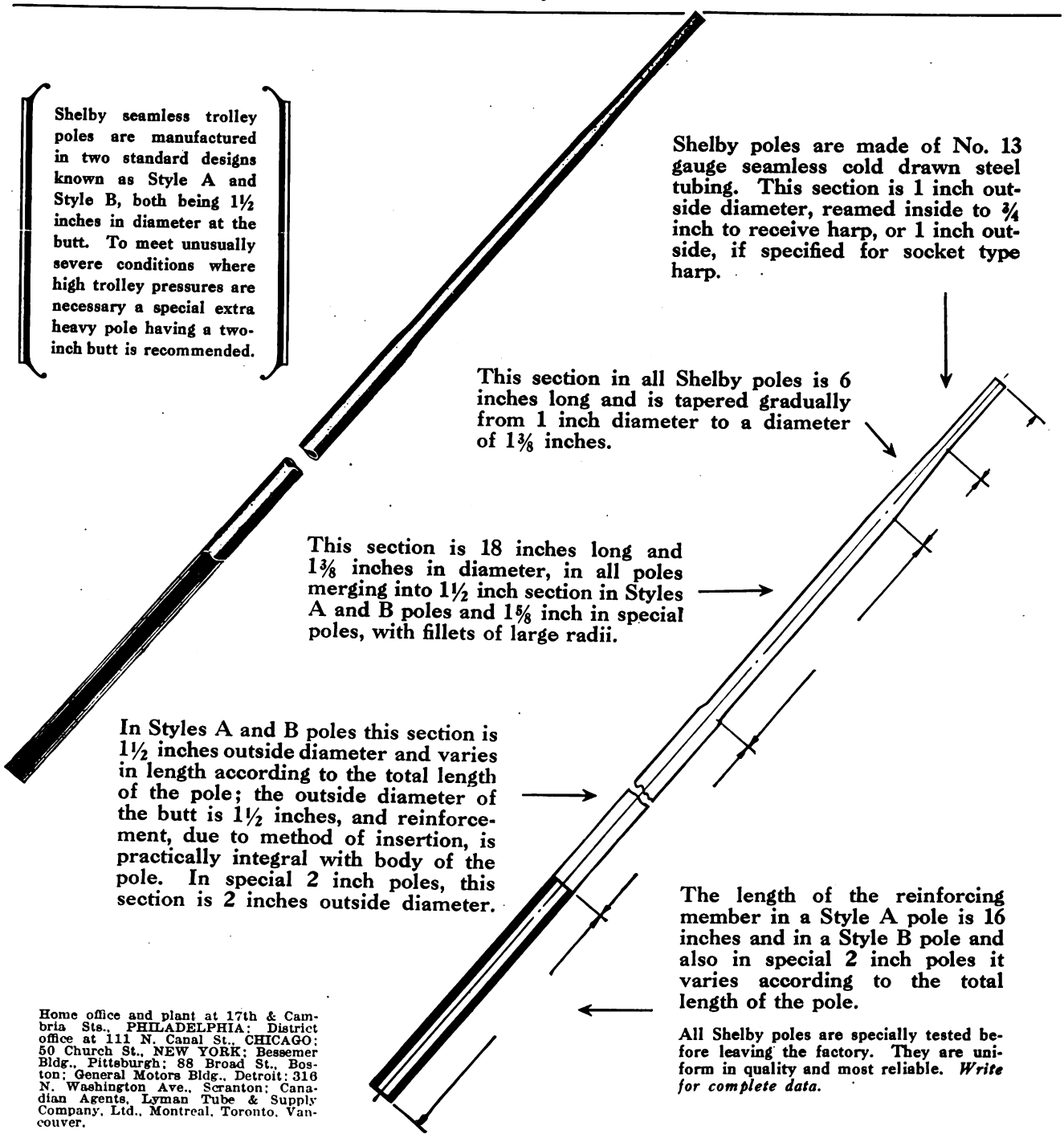
TIME-TESTED *by* THOUSANDS *of* MILES *of* SERVICE

Shelby seamless trolley poles are manufactured in two standard designs known as Style A and Style B, both being 1½ inches in diameter at the butt. To meet unusually severe conditions where high trolley pressures are necessary a special extra heavy pole having a two-inch butt is recommended.



Shelby poles are made of No. 13 gauge seamless cold drawn steel tubing. This section is 1 inch outside diameter, reamed inside to ¾ inch to receive harp, or 1 inch outside, if specified for socket type harp.

This section in all Shelby poles is 6 inches long and is tapered gradually from 1 inch diameter to a diameter of 1⅜ inches.

This section is 18 inches long and 1⅜ inches in diameter, in all poles merging into 1½ inch section in Styles A and B poles and 1⅝ inch in special poles, with fillets of large radii.

In Styles A and B poles this section is 1½ inches outside diameter and varies in length according to the total length of the pole; the outside diameter of the butt is 1½ inches, and reinforcement, due to method of insertion, is practically integral with body of the pole. In special 2 inch poles, this section is 2 inches outside diameter.

The length of the reinforcing member in a Style A pole is 16 inches and in a Style B pole and also in special 2 inch poles it varies according to the total length of the pole.

All Shelby poles are specially tested before leaving the factory. They are uniform in quality and most reliable. *Write for complete data.*

Home office and plant at 17th & Cambria Sts., PHILADELPHIA; District office at 111 N. Canal St., CHICAGO; 50 Church St., NEW YORK; Bessemer Bldg., Pittsburgh; 88 Broad St., Boston; General Motors Bldg., Detroit; 316 N. Washington Ave., Scranton; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.

ELECTRIC SERVICE SUPPLIES CO.

MANUFACTURERS OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL

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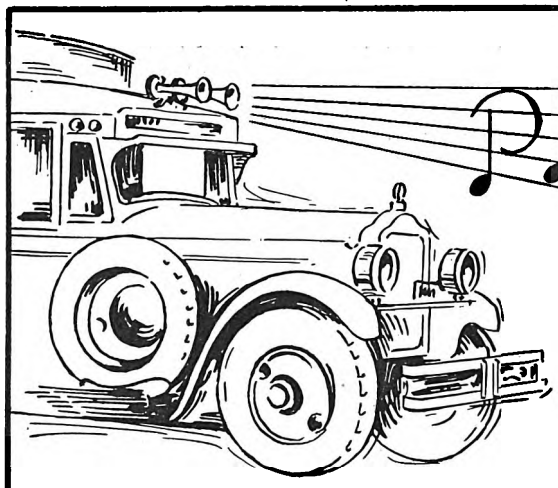
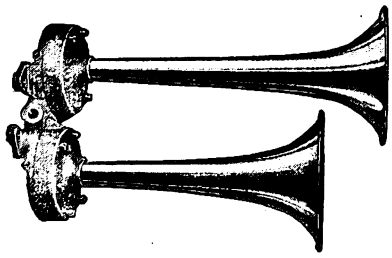


Sounding a NEW NOTE in WARNING SIGNALS



The Westinghouse Pneuphonic Horn uses very little air, operates successfully over a wide range of pressures, and is of sturdy and durable construction. It is available in single tone or chime design.

As your bus skims over the highway or ambles through traffic its warning signal must appeal for the right of way in tones that are positive but pleasing. It must be heard—it must not be harsh. Those who step out of your way today may want to step into your bus tomorrow—their good will should be retained.

Here is a device that gives warning of approach, unmistakable, yet not irritating or startling. Its tone is loud, clear, and harmonious, easily distinguished from ordinary highway noises, and distinctly audible over a wide area.

The PNEUPHONIC HORN

Write us for information and prices.

WESTINGHOUSE AIR BRAKE COMPANY

Automotive Division - - - - - - - - - Wilmerding, Pa.

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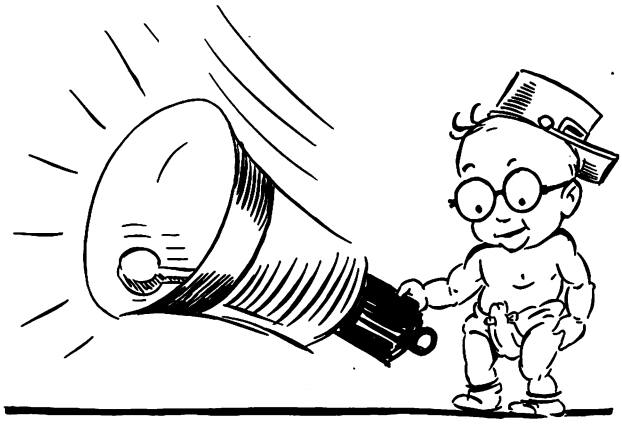

Ring Out The Old!

A Happy New Year to You All!

FAR be it from us to commercialize holiday greetings by insisting that Steel Twin ties will solve your 1929 track building problems.

But when the time comes for serious thinking about your 1929 track building program, allow us the opportunity to tell you about Steel Twin ties and modern track building machinery.

HAPPY NEW YEAR!

The International Steel Tie Co.
Cleveland, Ohio

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Cold weather requires *a fighting* gasoline

ZERO weather, wind and snow—a winter combination that tests to the limit the fuel you use in your buses. Gasoline to be dependable under such conditions, must possess to a high degree every feature essential to a good gasoline—quick starting in cold weather, proper arrangement of boiling point fractions assuring maximum development of power, economical mileage.

Red Crown Gasoline meets every one of these requirements. It is noted for its quick starting qualities. Low initial boiling point assures quick vaporization, so that the spark catches promptly.

Red Crown Gasoline is further characterized by the perfection of its chain of boiling point fractions, giving quick acceleration, maximum power and clean combustion. This is why Red Crown causes less dilution of oil in cold weather, why it gives more mileage per gallon.

If you would maintain your winter schedules; if you would reduce your winter operating expenses to the lowest possible point, Red Crown as a factor in accomplishing this surely deserves your consideration. Test it in one of your buses against any other fuel—prove to yourself that it is the most efficient and economical fuel—winter or summer.

STANDARD OIL COMPANY
(INDIANA)

General Offices: 910 South Michigan Avenue Chicago, Ill.

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Type W

YELLOW COACH

"8 cylinder"

TWO years of intensive engineering development, research and refinement, backed by the vast research laboratories and testing facilities of the General Motors Corporation, were required to develop a small vehicle, that would measure up in every particular to the high standards of excellence that are characteristic of larger Yellow Coach models.

Now, in every detail of design and construction—power plant, axles, frame, brakes, springs and body—we present a coach whose satisfactory performance and lasting qualities meet every Yellow Coach engineering tradition.

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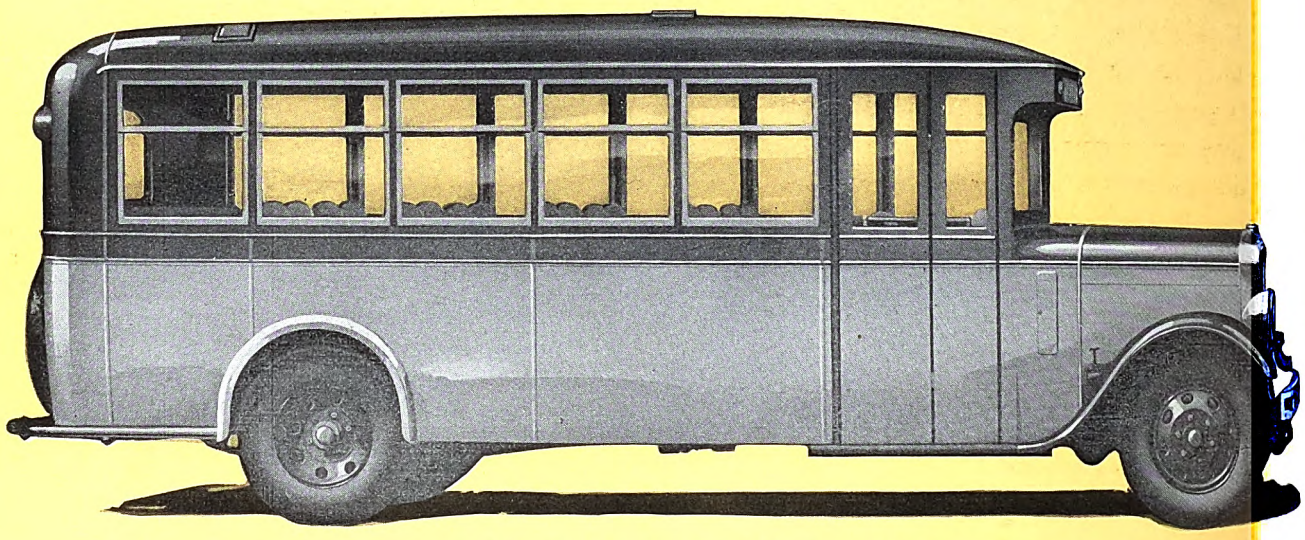

The full head-room 21-passenger City Service Coach

Combining Beauty *with* Practical Utility

THAT a full head-room coach can possess the distinctive grace of line and balanced proportions of a parlor coach, without sacrificing carrying capacity and head-room, is well proven in the design of the Type "W" City Service Coach.

Practical operating utility has been carefully combined with the features that attract and please passengers. In the building of Type "W" bodies, great care is exercised in the selection of materials and in the methods of assembly and construction. The frame work is built of thoroughly seasoned second growth ash. The exterior is covered with aluminum. There are no exposed wooden parts. Accurate uniformity and fit are assured by building and assembling each individual body section over precision jigs and fixtures.

This modern method of sub-assembly, while too costly for small production, is justified where volume can offset the high initial investment in jigs and fixtures. It results in the highest degree of accuracy and precision fit, and guarantees a well built body of lasting qualities. Furthermore, it insures freedom from squeaks and rattles.

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The entrance door of the City Service Coach is of the jack knife type and is built of steel—another advance in lasting body construction. Being built over jigs and fixtures permanent alignment and perfect fit is assured. Furthermore, it is lighter, stronger, free from rattles and will resist warping and twisting.

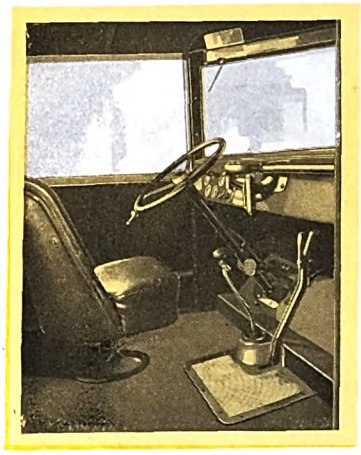
An important passenger requirement in city service operation is maximum visibility, good ventilation and heating, hence the careful planning of these three factors.

A practical rear of graceful proportions and pleasing lines

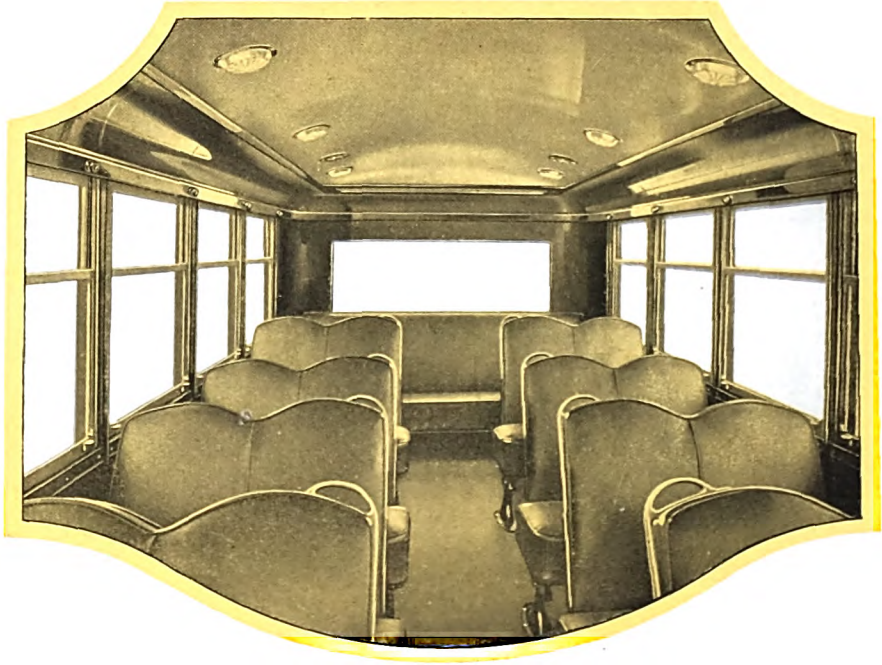
Windows are of the raised type, with fixed upper transoms, which permit of an exceptional high range of lift. Large ventilators are set in the roof and added circulation is provided by three large cowl ventilators. Heating is supplied by a blower system that eliminates all pipes within the body. An electric switch on the dash controls the entire heating system.

The body wiring is conveniently located under the advertising racks and is removable as units. All body wiring is carried to one terminal block on the chassis to simplify the joining of chassis and body circuits.

The full head-room body can be easily converted into a beautiful semi de luxe 21-passenger vehicle by installing parlor car chairs and window drapes, at a small extra cost.



Good visibility for the passengers and every convenience for the driver. Fittings by Ternstedt



There are generous accommodations for 21 seated passengers. The seats are well shaped, comfortable, strongly built and attractively upholstered in genuine brown leather. An alternative arrangement is the use of longitudinal seats over the wheel housings, providing accommodations for 23 seated passengers

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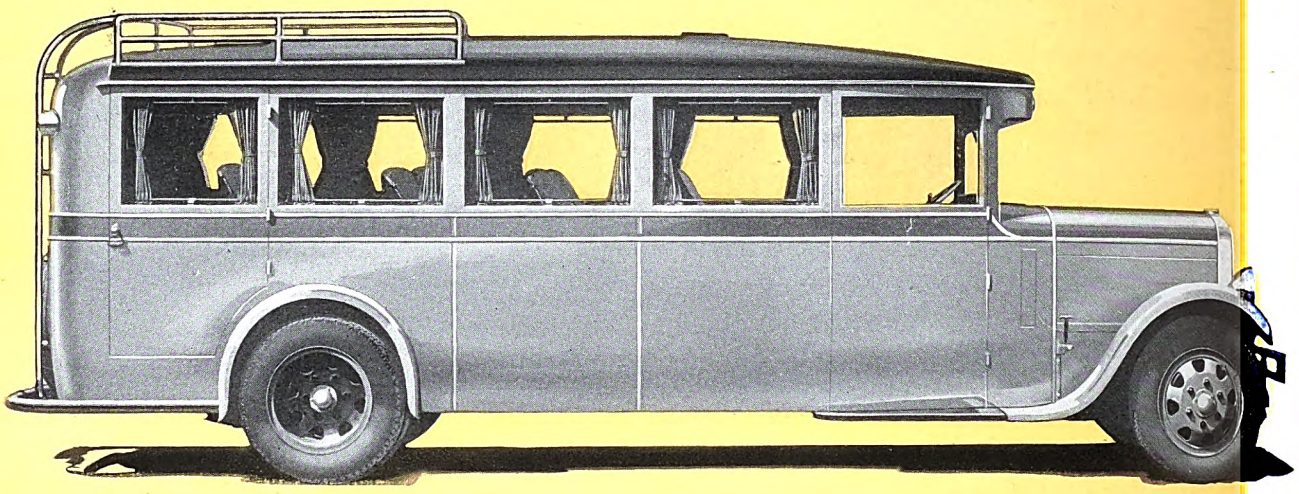


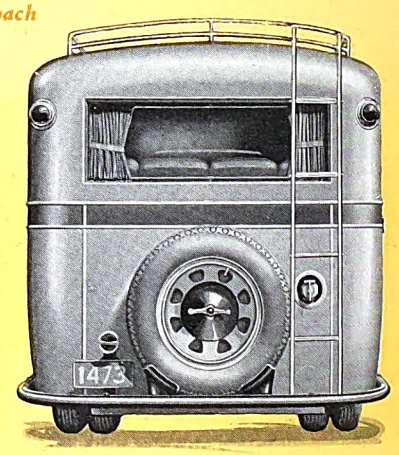
The 17-passenger Parlor Coach

The Parlor Coach

THE 17-passenger parlor coach was designed to approximate in every detail the performance and desirable features usually associated with the finest of personal motor cars. It is thoroughly modern in every detail of appearance and provision for passenger comfort and convenience. Its speed, acceleration and all-round performance can truly be compared with America's finest motor cars.

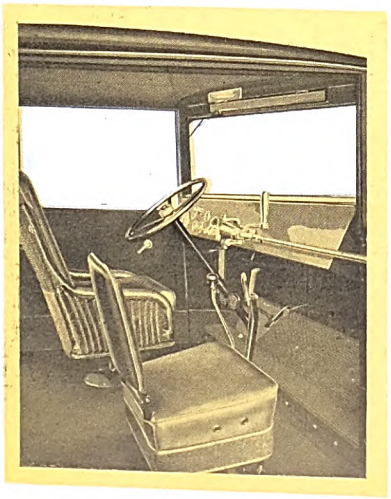
It is built with a narrow overall width (only 84 inches) to permit greater flexibility of operation and speed on narrow highways and in heavy city traffic.

17 passengers can be accommodated with more than ordinary comfort. All chairs are finely and strongly built of tan colored fibre, upholstered in rich green Spanish leather. On the left side are four high-backed double chairs, and on the right, four high-backed single chairs. The rear lounge seat accommodates four. At the driver's right is a folding observation chair.



The rear of the Parlor Coach. Beauty of appearance is combined with practical utility. The emergency door is on the left side at the rear

An attractive and comfortable feature . . . unusually high (40 in.) back chairs. Fittings by Ternstedt



At the driver's right is a folding observation chair

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At a slight extra cost, an alternative seating arrangement can be had by installing special seats that unfold intothe aisle space, accommodating four additional passengers.

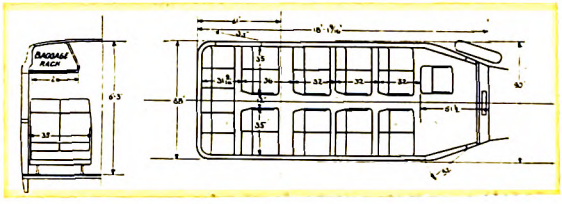
Following established practice in the fine motor car field, the interior side panels are finished in mohair, and the roof head-lining is of velour. Plate glass windows have smart looking drapes, sliding on chromium plated rods.

The Observation Parlor Coach

AS IN the City Service Coach, all body sections are precision built over special jigs and fixtures.

The Type "W" Observation Coach closely resembles the Parlor Coach in its appointments, trim and construction, but was designed to provide a full width (90 in.) full head-room (6 ft. 3 in.) Parlor Coach that will easily accommodate 21 seated passengers.

It has the same comfortable high back chairs as the Parlor Coach, but with four double chairs on each side of aisle.

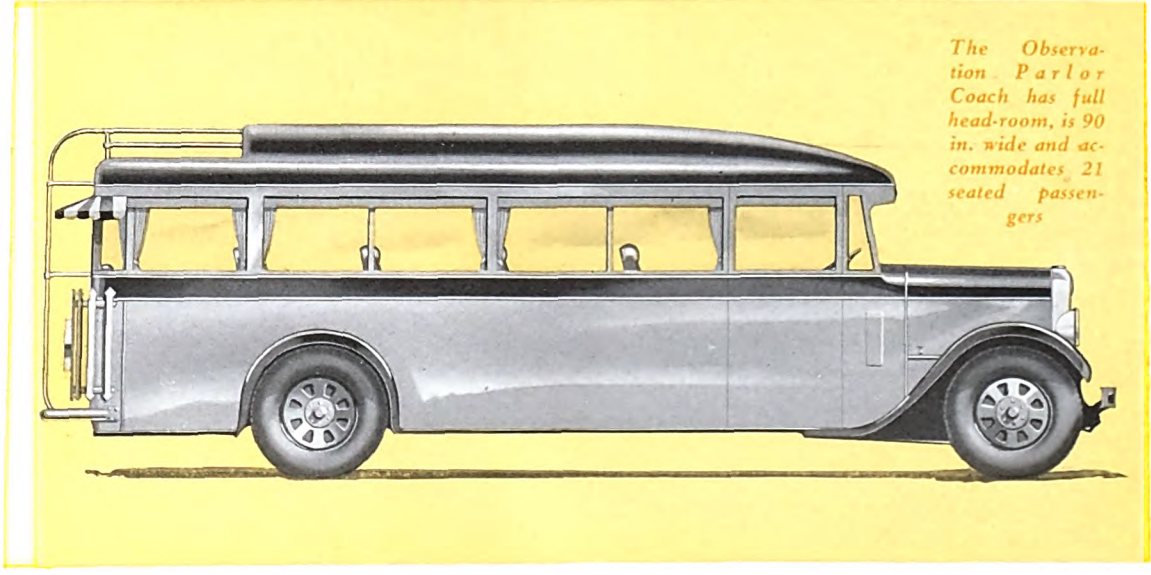


The Observation Parlor Coach has two rows of double
The Observation Coach has two rows of double

A Monitor type of roof was used to provide interior baggage racks of generous proportions. An exterior luggage rack provides further accommodations for excess baggage and special express service.

Wherever possible, aluminum has been used in order to combine durability and strength with lightness of weight. The fittings are by Ternstedt.

The observation rear has been carefully planned to insure the utmost in visibility for passengers.



The Observation Parlor Coach has full head-room, is 90 in. wide and accommodates 21 seated passengers

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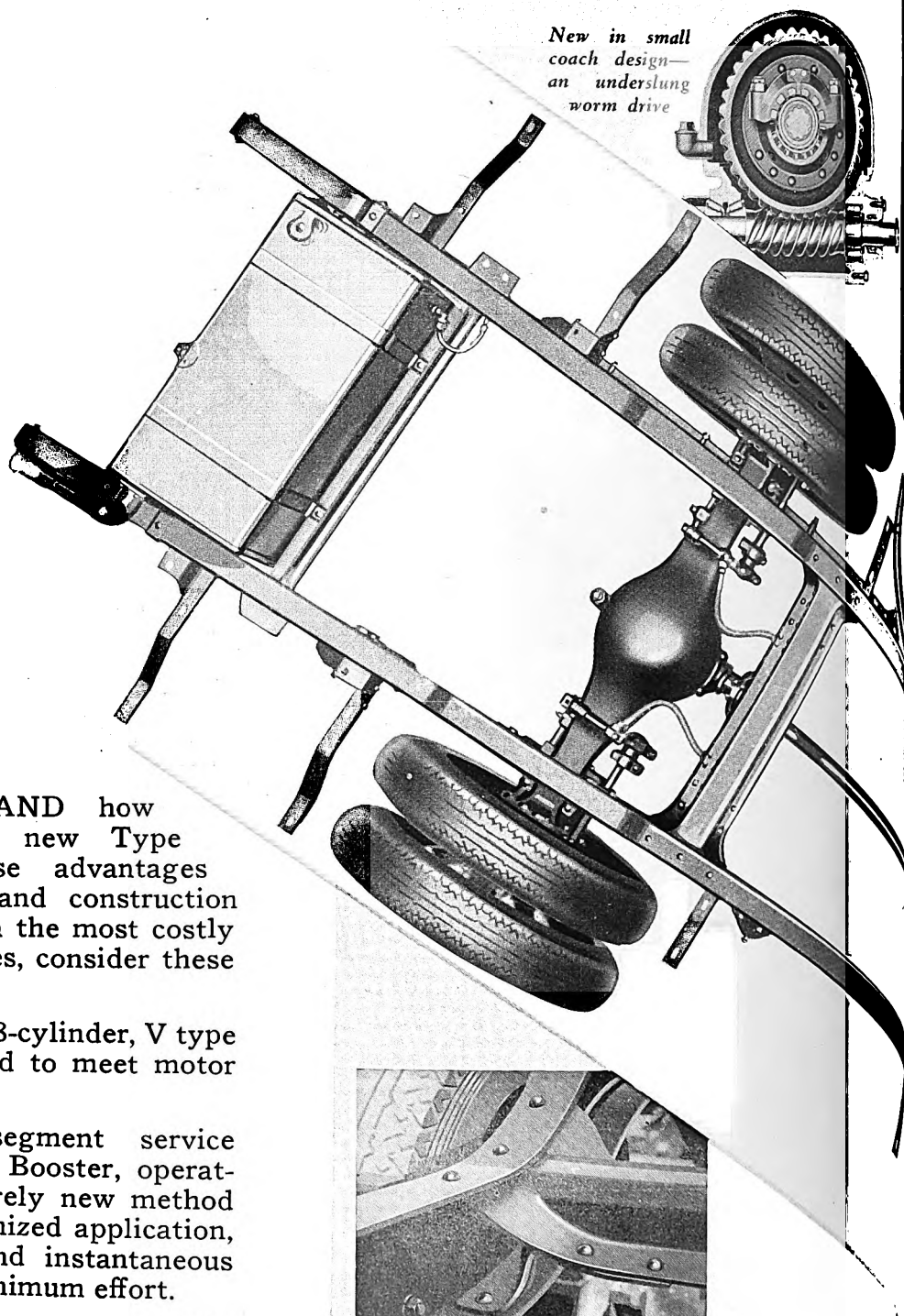


New in small coach design— an underslung worm drive

TO UNDERSTAND how completely the new Type "W" supplies those advantages of performance and construction usually found only in the most costly large capacity coaches, consider these important features—

The famous Cadillac 8-cylinder, V type power plant, modified to meet motor coach requirements.

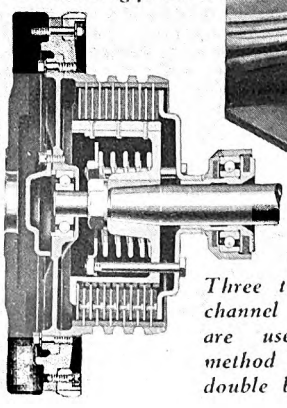
Four-wheel, four-segment service brakes with vacuum Booster, operating through an entirely new method of hydraulic synchronized application, insuring powerful and instantaneous brake action, with minimum effort.

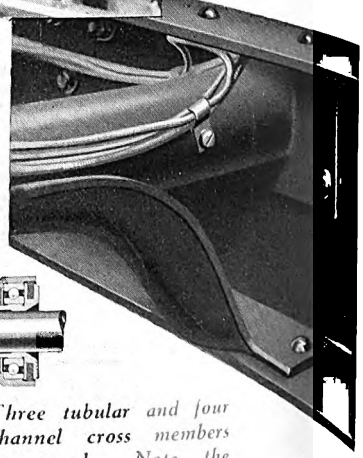
An underslung worm-driven rear axle, of over-size capacity.

A frame of unusually rigid construction, employing seven cross members, three of which are tubular. The side rail members are of 1/4-in. pressed steel, with a maximum depth of 8 inches.

A new front spring suspension that results in exceptional roadability, excellent riding qualities, easy steering, and minimum maintenance. This is accomplished by the outboard mounting of the front springs, which are shackled at the front to a heavy channel cross member outside the chassis frame, instead of directly under it.

Multiple disc clutch is cooled by induced air currents and has special lubricating features





Three tubular and four channel cross members are used. Note the method of flanging and double bracing to insure rigidity

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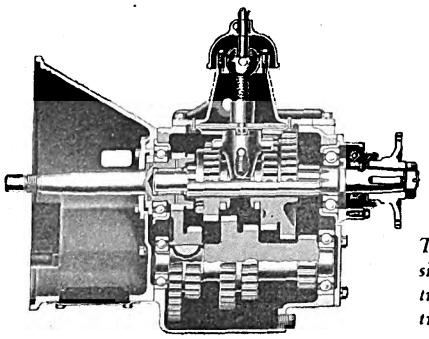
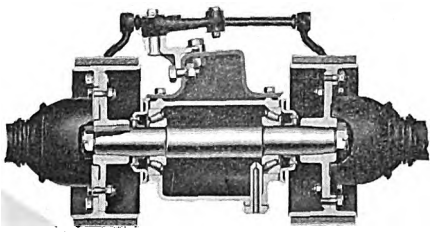


The specially designed four-speed transmission contributes to swift acceleration and quiet operation



The two external contracting brake bands are anchored on either side of the center bearing housing

The result is a lower frame level, wider spring centers, better balance, relief to wheel bearings, and protection to steering gear from heavy road shocks, and the elimination of any tendency of spring action to throw the steering gear out of alignment.

All spring mountings are adjustable, of a new patented design which eliminates the common two-piece shackle, and simplifies adjustment and maintenance.

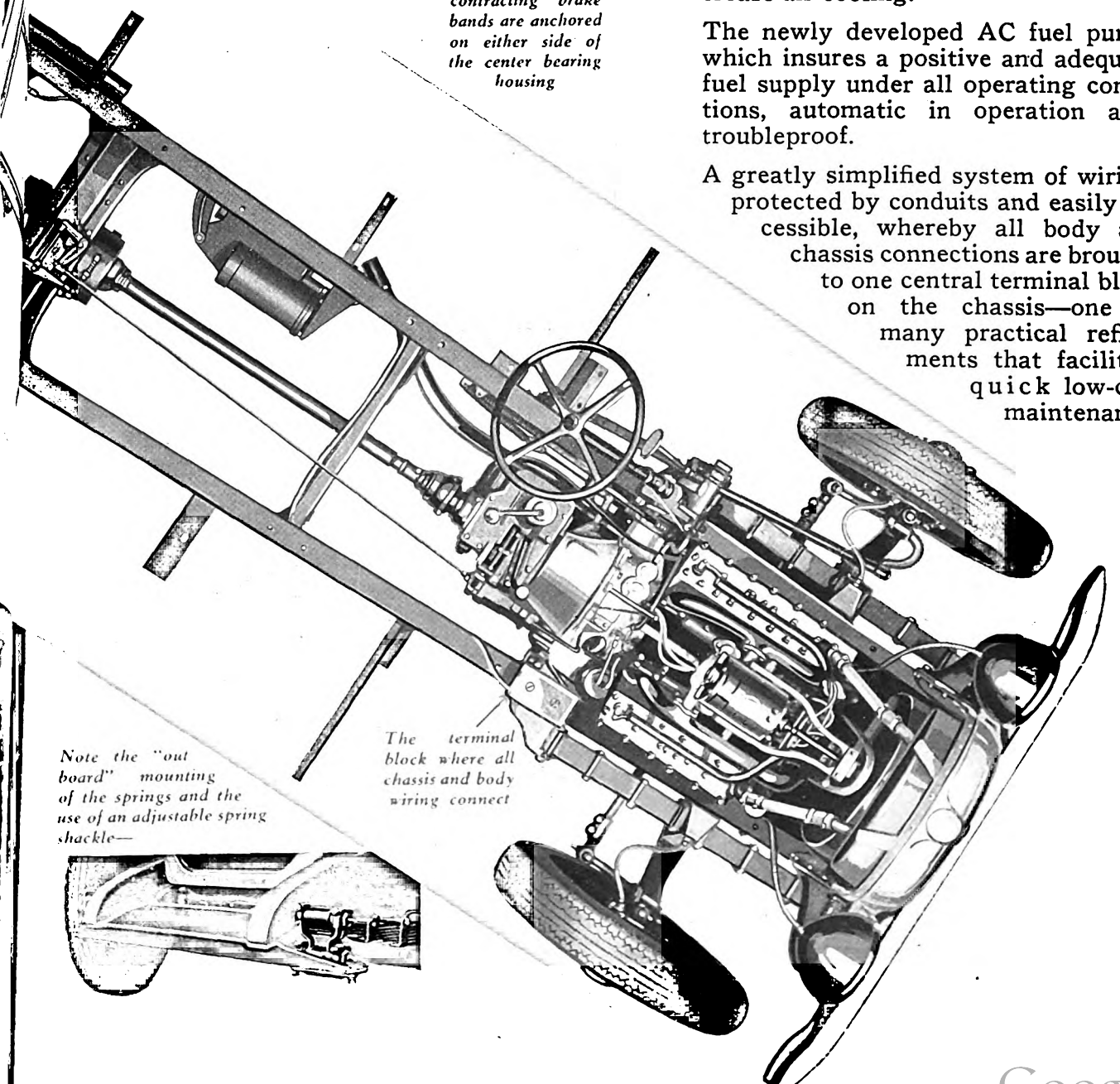
A four-speed transmission, new in small coach design.

The fastest, easiest steering ever known in a coach of this capacity.

A vertical tube radiator, of 518 cubic inch frontal area and nine gallon capacity. Core specially shrouded to increase air cooling.

The newly developed AC fuel pump, which insures a positive and adequate fuel supply under all operating conditions, automatic in operation and troubleproof.

A greatly simplified system of wiring, protected by conduits and easily accessible, whereby all body and chassis connections are brought to one central terminal block on the chassis—one of many practical refinements that facilitate quick low-cost maintenance.



The terminal block where all chassis and body wiring connect

Note the "out board" mounting of the springs and the use of an adjustable spring shackle—

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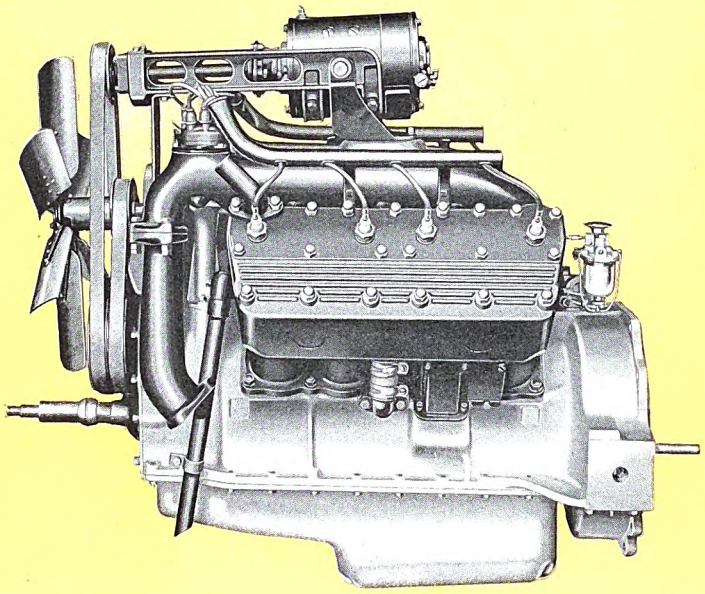
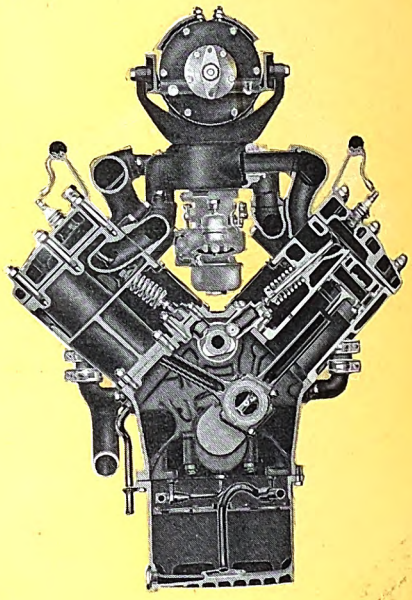


The famous Cadillac Engine modified to meet the requirements of motor coach service. 341 cu. in. displacement

Note that the 12-volt generator is easily accessible and well ventilated



THE same wonderful source of tremendous power, fast acceleration, smooth flexibility and freedom from vibration that gained for Cadillac its world-wide reputation for unexcelled performance is used in the Type "W" Yellow Chassis.

The V-type, 8-cylinder engine, as modified to meet the requirements of transportation service, is ideally suited to small coach construction.

It is very compact, and yet all units are easily accessible. The short engine length makes possible a greater useful loading space for a given overall length.

It is mechanically simple. Two short cylinder blocks paralleling one another insure highly efficient and simplified cooling, better carburetion, fuel distribution and lubrication.

It has long life. All units that are subjected to high stresses, such as crankcase, crankshaft, camshaft and cylinder blocks, are short and consequently very rigid. Their useful life, therefore, is greatly increased.

There is no tendency for the short crankshafts and short camshafts to whip. Three main bearings support the crankshaft in precise alignment, as against the seven or nine required in engines of greater length. Only four crank throws are required, where other engines require one for each cylinder. Compensating weights permanently attached to the crankshaft give inherent balance.

With this design the power impulses are equally spaced and are equally overlapping. Smooth power is assured whatever the engine speed.

Furthermore, it weighs less for its rated horsepower than a six or straight line eight of similar piston displacement.

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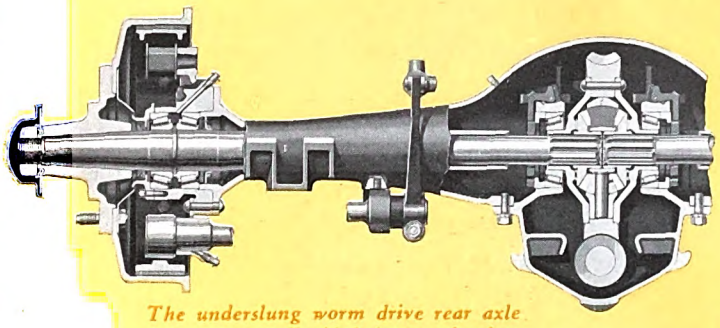
Another notable development new in small coach design is the use of an oversize, underslung, worm-drive rear axle.

Exceptional strength, a safety factor far in excess of normal requirements, and many features calculated to facilitate maintenance, characterize the entire design of this important unit.



The underslung worm drive rear axle has an unusually high factor of safety to take care of maximum loads

The worm shaft is mounted in a carrier on two opposed taper roller bearings at the rear end, and a straight type roller bearing at the forward end. The rear bearing takes fore and aft thrust of the worm shaft in addition to the radial load. The front bearing takes radial load only. The bronze worm wheel is riveted to the differential case.

The front axle is of the reverse Elliott type, with I-beam section. The load thrust is taken on roller bearings interposed between the axle end and the lower fork of the steering knuckle, as well as on the wheel bearings. The pivot pin and wheels are slightly inclined in order to provide for better steering and roadability.

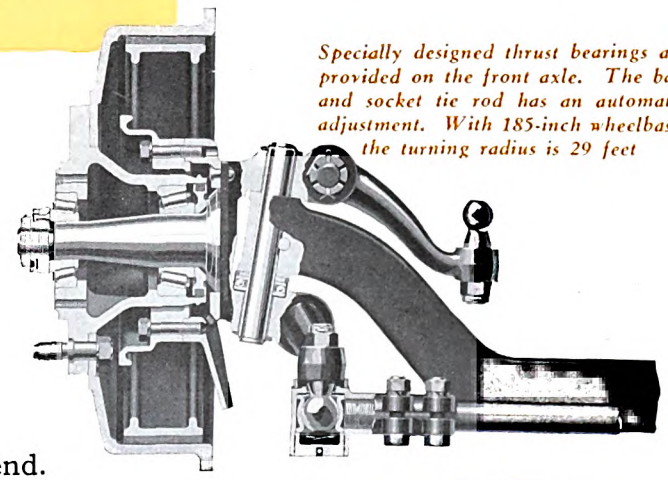
The front axle steering tie rod is of the heavy self-adjusting ball and socket type. Wear is automatically compensated for.

The steering gear is of the cam and lever type, with provision for easy adjustment or quick removal.

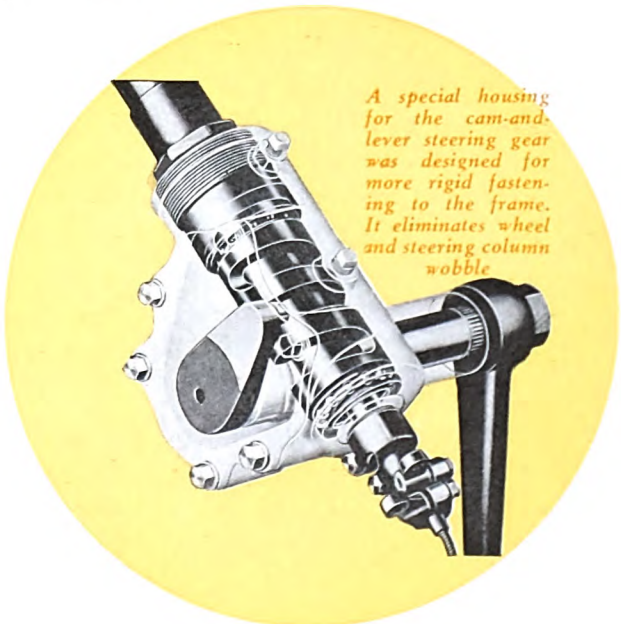
Careful attention has been paid to caster and camber, as well as to all other factors that are of vital importance in influencing easy steering and simplicity of adjustment.

The four-wheel service brakes employ a vacuum booster with hydraulic control to actuate the mechanical-type brakes.

A new type of hydraulic control was first



Specially designed thrust bearings are provided on the front axle. The ball and socket tie rod has an automatic adjustment. With 185-inch wheelbase, the turning radius is 29 feet



A special housing for the cam-and-lever steering gear was designed for more rigid fastening to the frame. It eliminates wheel and steering column wobble

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developed, in which the operating cylinders were reduced in diameter and mounted away from the wheels, so that they would be easily accessible, well ventilated and removed from any destructive heat generated by the brakes. To this was added a vacuum booster. This construction combines the light pedal pressure of the booster, the smooth efficiency, and the perfect brake equalization of the hydraulic, with all the desirable advantages of four-wheel mechanical-type brakes.

Adjustments for wear are exceedingly simple, and no equalization adjustment is necessary. Due to the even pressure maintained, and the unusually large braking area, brake lining life is exceedingly great. Brake drums are of gun iron, 16⅛ in. in diameter, ground to a perfect fit and balanced after being machined outside as well as inside. The combined service and emergency brake area amounts to 836 square inches, or nearly six square feet.

The emergency brake mechanism is a duplex propeller shaft brake entirely independent of the four-wheel service brakes. These two 8-in. gun iron drums are 3½ in. wide. Brake bands are external contracting, operated by hand lever.

Summed up, service brakes in the Type "W" combine these specific advantages—

Powerful and smooth braking action, with very slight pedal pressure.

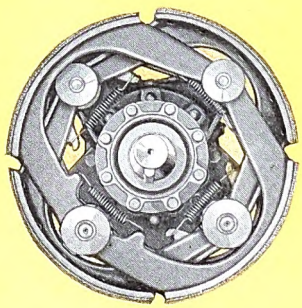
Perfect automatic equalization of brake pressures on all four wheels.

Adjustment for brake lining wear is exceedingly simple, quick and accurate.

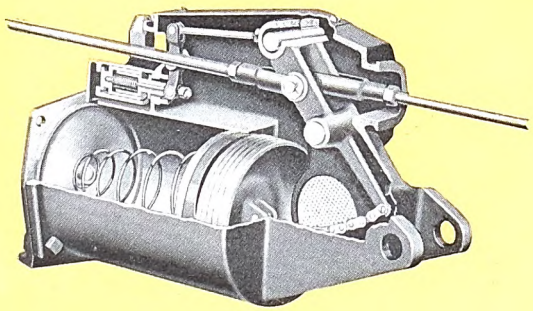
Low maintenance cost.

Easy accessibility and simplicity.

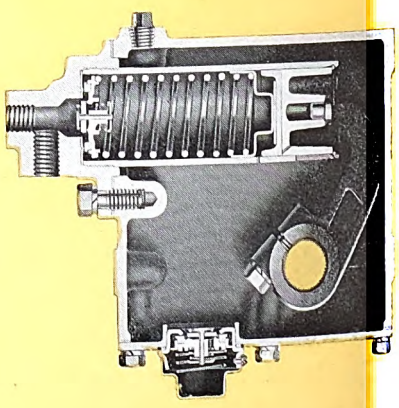
Each service brake contains four fabric lined shoes, interchangeable front and rear. Drums are of gun iron, machined and balanced



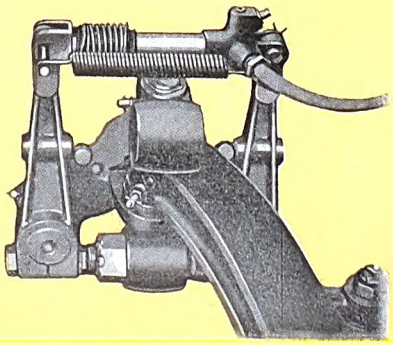
The vacuum booster "steps-up" the brake action and gets quick and positive results with light pedal pressure



TYPE W



The hydraulic master cylinder is the self-compensating type. The only rubber cup in the entire system is used here



The simplified operating cylinders of the hydraulic control that actuate the brake mechanism. They are mounted away from the wheels and are consequently well ventilated and accessible

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TYPE "W" SPECIFICATIONS

Chassis

GENERAL DIMENSIONS
Wheelbase, 185 in.
Dash to C/L. Rear Axles, 156⅝ in.
Frame height from ground loaded, 21⅜
Frame width—Front, 30 in.
Frame width—Rear, 41¼ in.
Track—Front, 69⅞ in.
Track—Rear, 65¼ in.
Turning radius, 28 ft. 3 in.
Overall width over rear tires, 81⅜ in.

ENGINE—Modified Cadillac V-8 cylinder, 3⅛ in. bore, 4½ in. stroke, 341 cu. in. displacement.

Fan—21 in. diameter, 6 blades mounted on roller bearings. V belt with adjustment.

Lubrication—Force feed to main bearings and connecting rods. Oil pump attached to crankcase top half and positively driven from spiral gear on cam shaft.

Water Circulation—Centrifugal Pump, gear driven.

Oil Cleaners—A.C. Type.

Carburetion—Special designed multiple jet plain tube type with adjustment for low and high speed.

Exhaust Manifold—Single porcelain enameled cast iron manifold on each cylinder block connected by Y branch to single exhaust pipe.

Crankshaft—Heat treated, statically and dynamically balanced. 3 main bearings, 2⅜ in. diameter; connecting rod bearings 2⅜ in. diameter.

Crankcase—Upper and lower halves aluminum with rigid webbing.

Ignition—Delco, battery type, 12 volt, automatic advance with two breakers, one breaker adjustable for synchronizing.

Battery—100 ampere hour, 12 volt, rubber case. Leads carried to side of case with special terminals.

Generator—Delco, 12 volt, 300 watt capacity. Automatic voltage regulation.

Starting Motor—Delco, 12 volt. manual shift.

RADIATOR—Vertical copper finned tube chromium plated shell.

CLUTCH—Multiple disc type, cooled by induced air current. Fabric friction linings. Adjustable and easily replaced.

CONTROL SET—Gear shift lever mounted directly on transmission at right of driver. Emergency brake lever at right of driver.

TRANSMISSION—Four speed selective, unit type mounted on engine flywheel housing.

PROPELLER SHAFTS—Tubular shafts with grease type metal joints. Center support bearing self contained, wide spacing between roller bearings; of sturdy construction to take propeller shaft brake stresses; large oil capacity.

STEERING GEAR—Cam and lever, mounted on top of frame, 19 in. wheel.

FRAME—Rigid, pressed steel side bars with kick up over rear axle. Seven cross members, three of which are tubular. Maximum side bar depth 8 in. Maximum flange width 3 in. Frame ¼ in. thick.

FRONT SPRINGS—Heat treated alloy steel, semi-elliptic 43 in. long, 3 in. wide. Shackled at front end.

REAR SPRINGS—Heat treated alloy steel, semi-elliptic 58 in. long, 3 in. wide.

SPRING MOUNTING—Metal shackle type. pins 1 in. diameter, side adjustment on all shackles.

FRONT AXLE—Reverse Elliott. Wheel loads taken on specially designed thrust bearings. Taper roller wheel bearings. Ball and socket tie rod, with automatic adjustment.

REAR AXLE—Underslung worm and wheel with cast steel housing. Axle semi-floating. Bearings taper roller with shim adjustment. Worm wheel bronze.

Ratios as follows:— 5.00-1 6.00-1 (Standard)
5.4-1 7.00-1

BRAKES—Service: 4-wheel hydraulic internal expanding type employing a Westinghouse Booster unit. Each brake drum has four fabric lined shoes simultaneously operated giving approximately even pressure all around drum: drums 16½ in. dia., shoes 3¼ in. wide; operating cylinders placed outside of drums keeping them free from all braking heat. Master cylinder arranged to automatically replace any leakage or fluid. **Emergency:** External contracting hand brake working on twin brake drums one on each end of propeller shaft center bearing, mechanically operated by pull-on type hand lever.

WHEELS—Pressed steel disc, cast steel hubs. Dual rear. Rims 20 in. dia.

TIRES—34x7.50 balloons, front and rear.

GASOLINE TANK — Capacity 46 gallons. Located and supported in rear end of frame.

GASOLINE FEED SYSTEM—A.C. Fuel Pump with integral strainer.

STANDARD ELECTRICAL EQUIPMENT — Ammeter, voltage regulator, reverse current cut-out, lighting, buzzer and ignition switches and heat indicator.

STANDARD CHASSIS EQUIPMENT—Front bumper, head lamps front fenders, hood, electric horn, tail and stop light, one extra disc wheel, speedometer, oil gauge and tools.

21-Passenger City Service Body

GENERAL DIMENSIONS
Coach length over bumpers—23 ft. 8 in.
Overall length of body—18 ft. 1⅜ in.
Overall width of coach—90 in.
Overall height (full load)—8 ft. 7⅜ in.
Head-room inside body—76½ in.
Floor height (loaded)—25⅛ in.
Height of step from ground (loaded)—13⅜ in.

SEATING ARRANGEMENT—Twenty-one passengers all facing forward. Eight double seats—4 on each side. Cross seat at rear seating 5. Bucket type driver's seat.

CONSTRUCTION — Framework of second-growth, thoroughly seasoned ash, braced and jointed in conformity with best body-building practice. All joints treated with white lead or glue and either screwed or bolted.

ROOF—Formed from slats, over ash car-lines, covered with black top decking. Construction extremely rigid and waterproof. Inside veneer.

PANELS—Entire exterior covered with sheet aluminum. No exposed wood members. Panels individual and readily detachable.

WINDOWS—Raised type, with fixed upper transoms. 15⅜ in. window lift. Sash of drawn brass providing maximum window vision and minimum weight. Equipped with anti-rattling devices and held to adjustable heights by racks and locks. Sash glazed with double strength window glass. Sash, glass and guides easily removable as a unit, 29⅞ in. post spacing.

ENTRANCE DOOR — Jack-knife type, steel, opening outward. Operated from driver's seat by adjustable mechanism. Upper door panels of glass. Entrance step incorporating safety tread.

EMERGENCY DOOR—Located at left side. Equipped with safety lock.

INTERIOR FINISH—Below belt rail—special composition recessed panels. Brown finish. Mahogany molding. Roof—white enamel. Floor covered with special waterproof composition.

SEATS—Upholstered in genuine brown leather. Full sprung cushions and backs. Light pressed steel pedestals. Seats fitted with polished grab-handles. Seat width 33 in.; aisle width 18¼ in. at cushion and 21¼ in. at seat back; seat spacing 30 in. to 33 in.

HEATING SYSTEM—Blower system. Air circulated around multitubular unit heated by exhaust gases. Controlled by switch on instrument panel.

VENTILATORS—Three large ventilators located in roof. Three ventilators in cowl.

WINDSHIELD—Plate glass with metal frame. Ventilating panel at top equipped with windshield wiper.

WIRING—Cables of stranded wire type, rubber and fabric covered. All exposed wiring protected with loom or metal conduit.

INTERIOR LIGHTING—Eight dome lights of 21 C.P. Light wiring self-contained in advertising racks and removable as a unit. Destination sign illuminated by three 4 C.P. bulbs.
Signal buttons at each seat.
Curtain, at rear of driver's seat.

ADVERTISING SPACE—Standard 11 in. wide advertising sign rack along upper part on both sides and rear of body, mahogany finish.

SUN VISOR AND DESTINATION SIGN—Hunter roller type. Size 8 in. x 40 in. Lettering space 6 x 36 in. Lettering optional. Sun visor located below destination sign.

STANCHIONS—Grab-rail in vertical position at entrance door.

REAR VISION MIRROR—Located on panel above and in front of driver.

LIGHTS—Front and rear marker lights with optional lens colors. Step light at entrance door.

BUMPERS—Tube type rear bumper and channel front bumper.

TIRE CARRIER—One spare tire carrier at rear.

PAINTING—Optional as to colors.

LETTERING—Extra charge for lettering, monograms, gold and silver leaf striping.

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TYPE "W" SPECIFICATIONS

17-Passenger Parlor Car Body

GENERAL DIMENSIONS
Overall length over bumpers—23 ft. 8 in.
Overall length of body—18 ft. 1⅜ in.
Overall width of coach—84 in.
Overall height (full load)—7 ft. 10¾ in.
Head-room inside body—68 in.
Overall height body including luggage rack—8 ft. 8¼ in.
Floor height (loaded)—25⅝ in.
Height of step from ground (loaded)—13⅝ in.

SEATING ARRANGEMENT—Seventeen passengers, all facing forward, accommodated in four rows of double seats on left side and four rows of single seats on right side of coach, a rear cross seat for four and an observation seat (hinged) alongside driver.

CONSTRUCTION—Same as in city service body.

ROOF—Formed from slats, over ash car-lines, securely fastened in place. Corners hammered aluminum. Roof covered with black top decking. Construction extremely rigid and waterproof.

PANELS—Exterior, side and rear covered with heavy gauge metal. No exposed wood members.

WINDOWS—Window post spacing 39 7/16 in. Glass ¼ in. plate, frameless, sliding in felt channels. All side and door windows of drop type, operated by Ternstedt heavy duty crank type regulators fitted with anti-rattlers. Rear window stationary.

ENTRANCE DOOR—Sedan type, 34 in. wide, opening outward controlled by adjustable mechanism from driver's seat. Entrance step incorporating safety tread.

EMERGENCY DOOR—Sedan type, 34 in. wide, opening outward, located at rear on left side of coach, fitted with safety lock.

BAGGAGE DOOR—Sedan type, 34 in. wide, opening outward, located at rear on right side of coach.

LUGGAGE RACK—On roof at rear—three bar type with folding steps and grab-rails at side of coach.

INTERIOR FINISH—Lower side panels of waterproof metal board covered with mohair. Roof headlining of velour. All hardware bright chrome finish. Floor covered with linoleum.

CHAIRS—De Luxe type, tan colored fibre chairs with arm rests. Detachable double cushions. Chair back cushions and arm rests all upholstered in genuine green Spanish leather. Double chair width over arm rests 38 in. Single chair width over arm rests 22 in. Chair spacing 30 to 39 1/16 in. Aisle width at arm rests 14 in.

HEATING SYSTEM—Blower system. Air circulated around multitubular unit heated by exhaust gases. Controlled by switch on instrument panel.

VENTILATORS—Three roof ventilators of large capacity. Three ventilators in cowl.

WINDSHIELD—Plate glass with metal frame. Ventilating panel at top equipped with windshield wiper.

WIRING—Cables of stranded wire type, rubber and fabric covered. All exposed wiring protected with loom or metal conduit.

INTERIOR LIGHTING—Eight 21 C.P. dome lights. Signal cord at each seat.

CURTAINS—Window drapes at side and rear windows sliding on chromium plated rods. Curtain at rear of driver's seat.

SUN VISOR AND DESTINATION SIGN—Sun visor metal fixed type. Built-in illuminated destination sign. Roller Hunter type. Lettering optional.

REAR VISION MIRROR—Located on panel above and in front of driver.

LIGHTS—Front and rear marker lights with optional lens colors. Step light at entrance door.

BUMPER (Rear)—Tube type rear bumper and channel front bumper.

TIRE CARRIER—One spare tire carrier at rear.

PAINTING—Optional as to colors.

LETTERING—Extra charge for lettering, monograms, gold and silver leaf striping.

21-Passenger Observation Parlor Car Coach

GENERAL DIMENSIONS
Overall length over bumpers—23 ft. 8 in.
Overall length of body—18 ft. 1½ in.
Overall width of coach—90 in.
Overall height—101 in.
Headroom inside body—75 in.
Floor height (loaded)—24½ in.
Height of step from ground (loaded)—14 in.

CAPACITY AND SEATING ARRANGEMENT—21 Passengers, eight double 35 in. wide fibre back chairs with headroll design, all facing forward, one cross seat at rear, seating five and individual driver's seat with adjustable pedestal. Aisle width 12 in. Seat spacing 32 in.

CONSTRUCTION—Same as in City Service Body.

ROOF—Center panels of roof three-ply poplar veneer. Front section formed to shape of roof. Roof over rear end slat construction. Center panel and rear end covered with long grain top material. Balance of roof covered with sheet aluminum.

PANELS—Entire exterior covered with sheet aluminum. No exposed wood member; panels are individual and readily detachable.

WINDOWS—Glass 3/16 in. plate, frameless, sliding in felt channels. All side windows including door windows, drop type, operated by Ternstedt heavy duty crank type regulators. Rear window stationary glazed with ¼ in. dangershield glass.

ENTRANCE DOOR—Sedan type opening outward, controlled by adjustable mechanism from driver's seat.

EMERGENCY DOOR—Located at left rear side. Equipped with three-point lock.

INTERIOR FINISH—Wainscoting and pillars above belt covered with leather cloth to match genuine leather used on chairs. Floor covered with battleship linoleum to harmonize with trimming. All hardware bright nickel finished.

CHAIRS—Fibre chairs with arm rest on aisle side only and divided backs accommodating two passengers each. Double cushions. Backs to be headroll type. Cushion backs and arm rests all genuine leather.

HEATING SYSTEM—Same as in City Service Body.

VENTILATORS—Four large ventilators with stationary grills and screen in roof. Three ventilators in cowl.

WIRING—All wiring protected with metal conduit. All circuits of 12 volt double contact type.

INTERIOR LIGHTING—Interior illuminated by six (6) 12 volt 21 C.P. dome lights.

SIGNAL CORD—Located conveniently for each seat.

CURTAINS—Window drapes at side and rear windows full width of window.

SUN VISOR AND DESTINATION SIGN—Sun visor, metal fixed type. Built-in illuminated destination Hunter sign with roller curtain having provision for 15 readings.

WINDSHIELD—Windshield, one-piece stationary, glazed with plate glass, equipped with windshield wiper.

REAR VISION MIRROR—Located on panel above and in front of driver.

LIGHTS—Front and rear marker lights with optional lens color. Step light in well and on top of entrance door. Combination tail and stop light and license bracket at rear.

OBSERVATION REAR—Equipped with ornamental grill and awning. Center of grill equipped with illuminated disc.

BUMPERS—Tube type rear bumper and channel front bumper.

TIRE CARRIER—One spare tire carrier mounted at front of coach on left side.

OUTSIDE BAGGAGE RACK—Baggage rack with tarpaulin cover on rear of roof with ladder at rear right side.

INSIDE LUGGAGE RACK—A built-in luggage rack on inside of body formed by space in monitor in front section of roof on both sides of body.

TOOL CHEST—Under rear cross seat, accessible thru left emergency door without disturbing rear seat cushions.

PAINTING—Optional as to colors. Extra charge for lettering.

GENERAL MOTORS TRUCK COMPANY
PONTIAC, MICHIGAN

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RELIEVING CONGESTION
through
TREADLE-IZATION

"The Circulating Load Uses the Rear Treadle

The circulating load—in at the front, out at the rear door by standing on the treadle —will relieve congestion in the front end of safety cars.

Isn't that simple? It is for your convenience and if you follow that practice you will find your street car riding much more comfortable. And, too, if you move away from the entrance you often will find a vacant seat even at the rush hours of the day.

The treadle—that piece of aluminum in front of the rear exit on safety cars—operates with but a minimum of assistance from you. Just stand on the treadle and the door opens automatically when the car stops. You not only get off the car quicker, but by relieving congestion at the entrance door, help us to give you better service."

This is the way the Georgia Power Company presents treadle-ization to its passengers.

NP

NATIONAL PNEUMATIC COMPANY

Executive Office: Graybar Building, New York

General Works, Rahway, New Jersey

CHICAGO
518 McCormick Building

MANUFACTURED IN TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building

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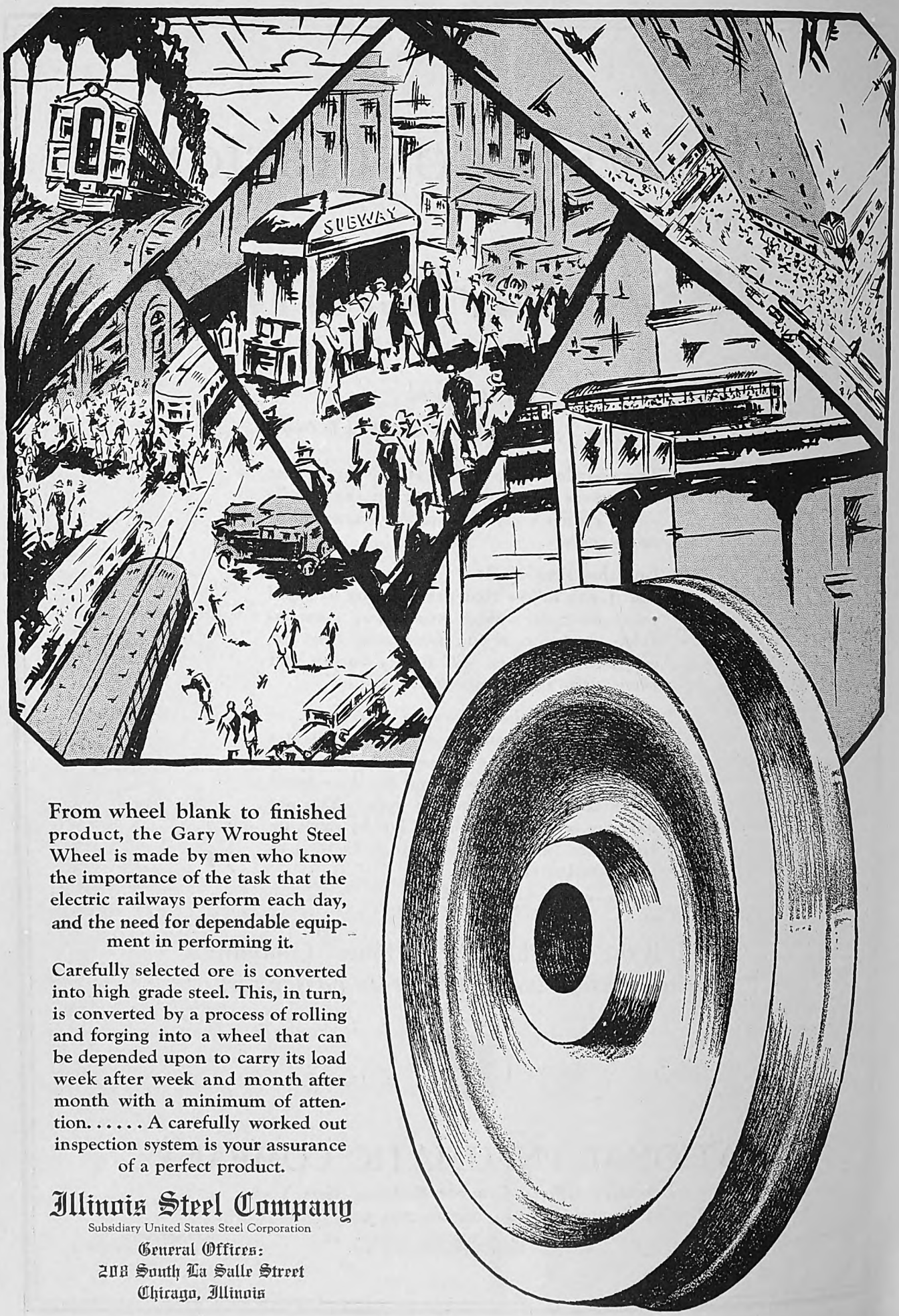

From wheel blank to finished product, the Gary Wrought Steel Wheel is made by men who know the importance of the task that the electric railways perform each day, and the need for dependable equipment in performing it.

Carefully selected ore is converted into high grade steel. This, in turn, is converted by a process of rolling and forging into a wheel that can be depended upon to carry its load week after week and month after month with a minimum of attention. . . . . A carefully worked out inspection system is your assurance of a perfect product.

Illinois Steel Company
Subsidiary United States Steel Corporation
General Offices:
208 South La Salle Street
Chicago, Illinois

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Competition . . . NEVER Waits!

WRITE it down that competition will either benefit or destroy a business, but whichever it does, it never waits!

You need Cincinnati Modern Cars on your property today. Tomorrow the job of keeping your present patrons, winning back your lost ones, will be harder.

Your cars are your salesrooms, your customers are being impressed by the service you render today, not the service you may have been *planning* to render all these years.

Look to your cars—they're the foundation of your business.

Cincinnati cars will increase your business, create and *hold* more business—and they'll pay for themselves in a short time out of increased profits.

CINCINNATI CAR COMPANY
CINCINNATI, OHIO

CINCINNATI BALANCED LIGHTWEIGHT CARS

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The Dayton Integral of Track and Paving

THE Dayton Integral System of Track and Paving Structure has been perfected through years of Engineering Research plus long experience with paved track.

Called forth by inherent weakness of wood tie, gravel ballast, with separate paving slab.

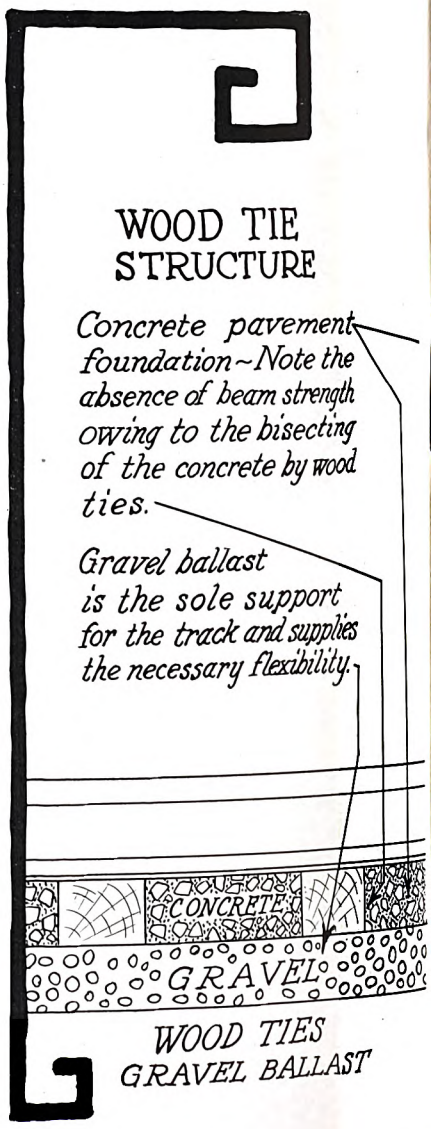
The Dayton Integral System unifies track and paving into a durable monolithic structure, in which complete strength of all parts is uniformly developed.

More than a tie, the Dayton Tie becomes in the Integral System a reinforcing member, plus an effective device for absorbing traffic vibration, which otherwise tends to destroy the concrete.

Both track and paving loads are carried by the whole thickness of the reinforced slab, much as concrete and reinforcing of a floor combine to carry a floor load.

Vibration absorption is accomplished by a mixture of asphalt and abestos fibre, contained in a metal box. Upon this mixture rests a wood block for the rail bearing.

Many examples prove soundness. Notably Toledo, Ohio. Here it was necessary to wreck some eleven-year-old Dayton Integral Track (in perfect condition) to build an undergrade railway crossing. The Track was so solid that heavy pile drivers were resorted to after other demolition methods failed.



Dayton Mechanical Tie

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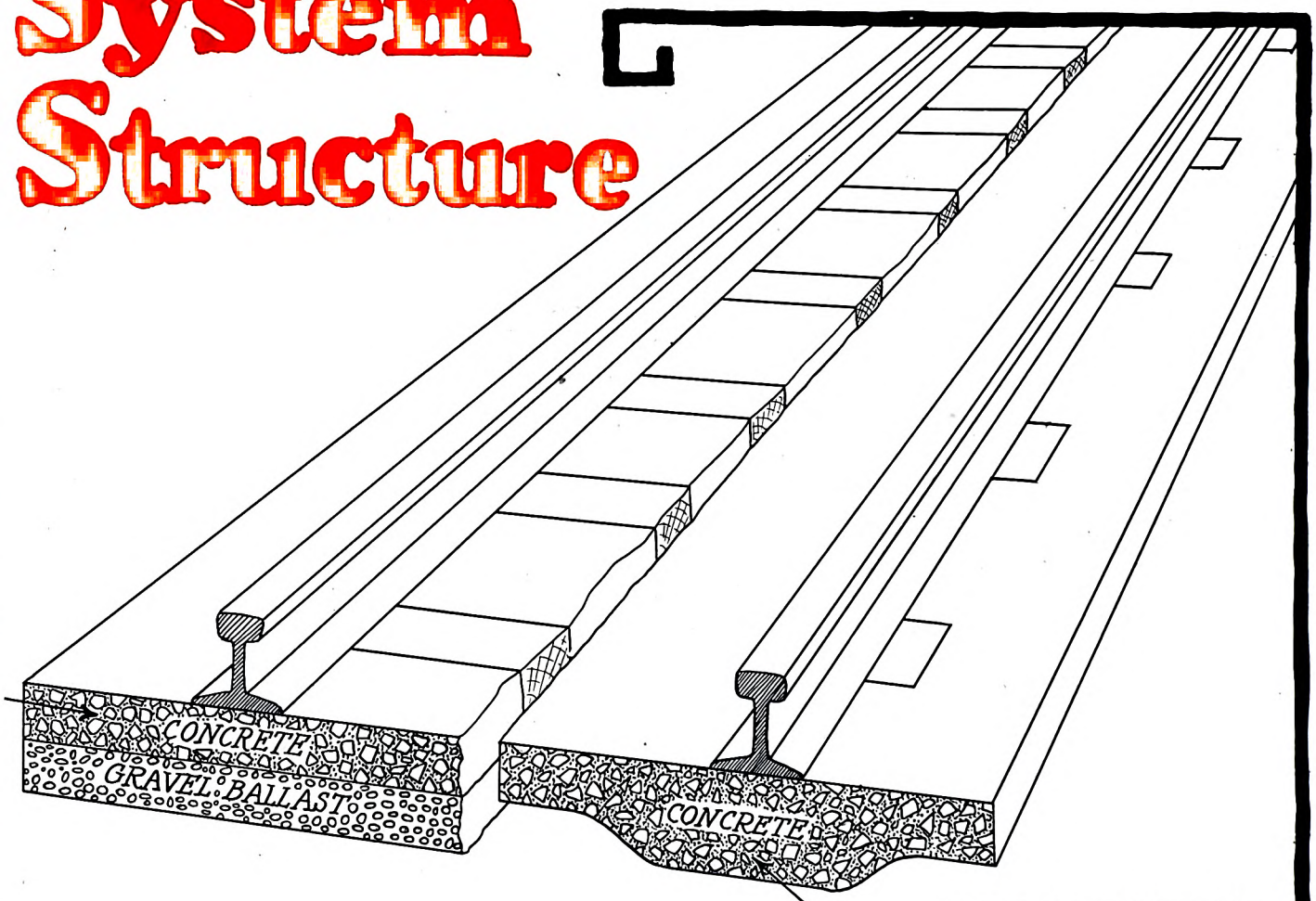
System Structure

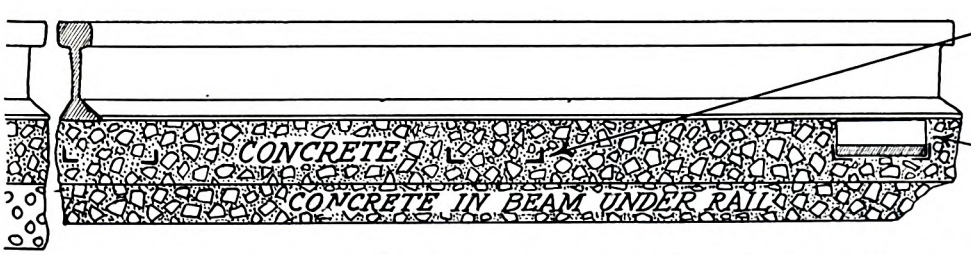


DAYTON INTEGRAL STRUCTURE

The concrete here serves as foundation for both pavement and track

The tie members reinforce the concrete beam, the whole thickness of which, both above and below the ties, contributes the strength.

The tie members, with their asphalt-asbestos cushion, give protection to the concrete from vibration and supply the flexibility



DAYTON TIES IN CONCRETE

Company - Dayton, Ohio -

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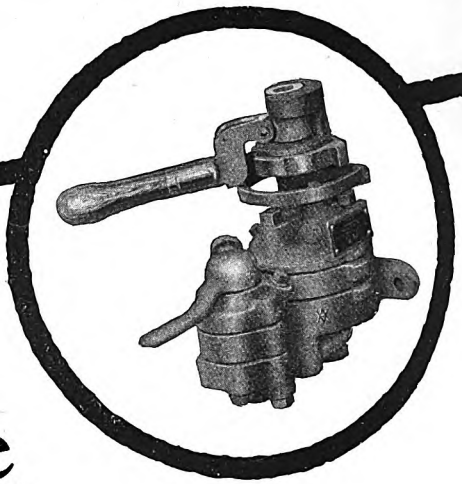

Common—yet not Commonplace.

The Safety Car Control Equipment . . . which interlocks power, brakes, and door control to provide maximum safety and convenience for cars operated by one man . . . is now universally used by traction properties.

To street railway men this equipment is familiar, yet not devoid of interest. It still attracts attention by virtue of its contribution to safe, speedy, and economical transportation. Its potentiality for improvement in service and public goodwill is being recognized more extensively from year to year.

SAFETY CAR DEVICES CO.
OF ST. LOUIS, MO.
Postal and Telegraphic Address:
WILMERDING, PA.
CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH

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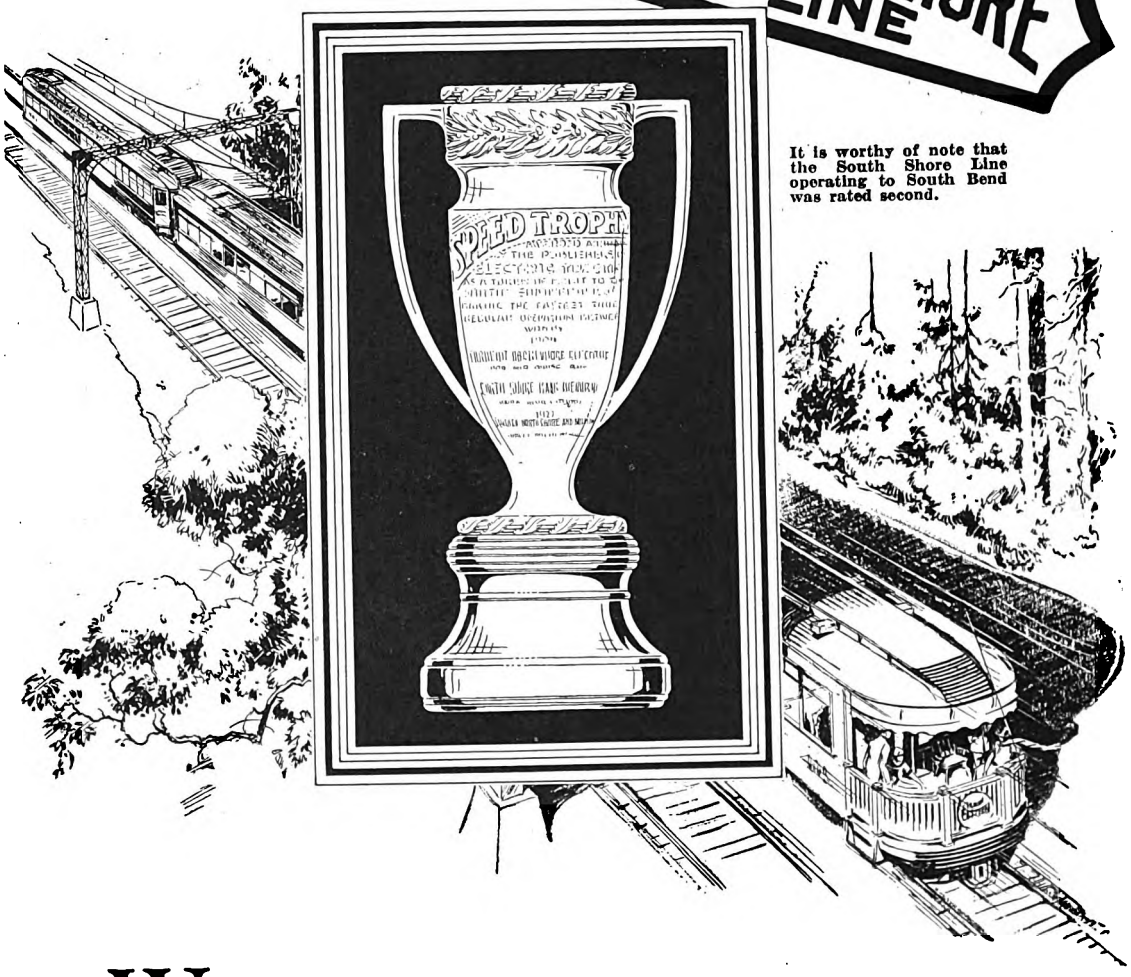
Again!!

America's Speed Trophy

goes to the NORTH SHORE LINE



It is worthy of note that the South Shore Line operating to South Bend was rated second.

We congratulate the winner, and are pleased that the performance of "Standard" wrought steel wheels and forged steel axles contributed to this success

STANDARD STEEL WORKS COMPANY

PHILADELPHIA, PA.

WORKS: BURNHAM, PA.

CHICAGO
NEW YORK
RICHMOND
PITTSBURGH

ST. LOUIS
HOUSTON
PORTLAND
SAN FRANCISCO

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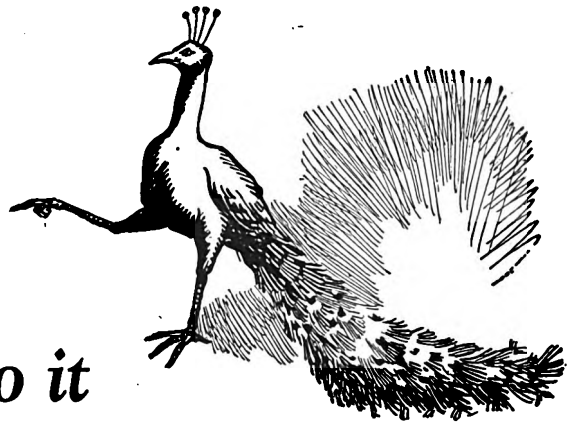

Our story *and we'll stick to it*

PEACOCK STAFFLESS BRAKES

1. *Are Most Powerful:*—An average man can apply up to 3000 lbs. braking force with a 20-inch hand-wheel.

2. *Are Fast:*—This powerful braking force can be applied most rapidly and effectively with Peacock Staffless Brakes, stopping car in shortest possible time.

3. *Have Unlimited Capacity:*—Unique in ability to wind in almost any amount of chain without binding. Neither slack in rigging nor worn brake shoes can prevent effective operation.

4. *Do Save Space and Weight:*—Despite rugged construction and great capacity, Peacock Staffless Brakes occupy minimum platform space and weigh only 72 lbs.

5. *Require Least Maintenance:*—Graphite bronze bushings do away with the need for periodical oiling. Every part strong and simple.

NATIONAL BRAKE COMPANY, Inc.

890 Ellicott Square

Buffalo, N. Y.

Canadian Representative
Lyman Tube & Supply Co., Ltd., Montreal, Can.

General Sales Representatives
The Ellcon Co., 50 Church St., New York

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COLUMBIA

Railway and Utility Supplies

Castings—Grey Iron, Brass and Aluminum

Forgings
Special Machinery and Patterns

Machine and Sheet Metal Work

Armature and Field Coils.

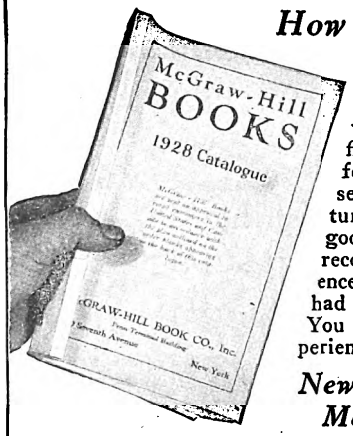
The Columbia Machine Works and M. I. Co.
265 Chestnut St., corner Atlantic Ave.,
Brooklyn, New York

Griffin Wheel Company
410 North Michigan Ave.
Chicago, Ill.

Griffin Wheels
with
Chilled Rims
and
Chilled Back of Flanges
For Street and Interurban Railways

FOUNDRIES:

Chicago	Boston	St. Paul
Detroit	Kansas City	Los Angeles
Denver	Council Bluffs	Tacoma
Cleveland	Salt Lake City	Cincinnati



How to keep up with your field

How do you keep in touch with developments in your field? Where do you turn for reference, study or research? Where can you turn? What's available? A good part of the written record—the "canned experience" of your field is to be had in McGraw-Hill Books. You have the key to this experience in the

New 1928 Catalogue of McGraw-Hill Books

The catalogue lists and describes all McGraw-Hill Books in dozens of different branches of dozens of different fields.

It gives you the key to the existing literature on many different scientific engineering and business subjects.

It is a valuable catalogue to have handy and a copy is waiting for you if you want one. Just send us your name and address.

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The catalogue describes a plan whereby you can put your book-buying on a convenient budget basis—get the books that you want as you need them—pay for them by the month as you use them.

Send for a copy —it's free

McGraw-Hill Book Co., Inc., 370 Seventh Avenue, N. Y.

Send me the NEW 1928 McGRAW-HILL CATALOGUE to the address given below. The catalogue is free I understand.

Name .....
Address .....
City and State .....
E. 12-29-28

Used and Surplus Equipment

INDIVIDUAL items of used equipment, or surplus new equipment, or complete plants, are disposed of (and found) through advertising in the *Searchlight* Section of this paper.

This is the section which so effectively aided the Government in selling the many millions of dollars worth of surplus material and equipment accumulated during the war without disturbing the market.

"SEARCHLIGHT"

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Specify these poles . . . *then cut your maintenance budgets for 40 years!*

PUT these strong, long-lasting Prettyman Preserved Poles of Southern Yellow Pine in your lines in 1929. Then forget them . . . forget replacement and maintenance costs until 1969. Creosoted under pressure, full length to the heartwood, they will last from 25 to 40 years—5 to 8 times the natural life of an untreated pole, which in 40 years would cost you something like 23 times its original price in replacements and labor.

Southern Yellow Pine is stronger, too. It has 44% higher static bending strength than the next strongest pole wood. Specify it and cut equipment costs by using fewer or smaller poles per given load. But be sure it is Prettyman Preserved for, however strong, untreated pine is highly susceptible to the attacks of termites (white ants) and decay-producing fungi. Write today for prices on air-seasoned Prettyman Preserved Poles, framed and treated to your own specifications.

J. F. Prettyman & Sons
Wood Preserving Plant
Charleston, S. C.

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Bankers and Engineers

Ford, Bacon & Davis
Incorporated
Engineers
39 Broadway, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

The J. G. White Engineering Corporation
Engineers — Constructors
Steam and Hydro-Electric Power Plants, Gas Plants, Steam and Electric Railroads, Transmission Systems, Buildings and Industrial Plants.
43 Exchange Place New York

STONE & WEBSTER
Incorporated
Design and Construction
Examinations Reports Appraisals
Industrial and Public Service Properties
NEW YORK BOSTON CHICAGO

THE BEELER ORGANIZATION
Transportation, Traffic, Operating Surveys
Better Service—Financial Reports
Appraisals—Management
52 Vanderbilt Ave. New York

SANDERSON & PORTER
ENGINEERS
PUBLIC UTILITIES & INDUSTRIALS
Design Construction Management
Examinations Reports Valuations
CHICAGO NEW YORK SAN FRANCISCO

ENGELHARDT W. HOLST
Consulting Engineers
Appraisals Reports Rates Service Investigation
Studies on Financial and Physical Rehabilitation
Reorganization Operation Management
683 Atlantic Ave., BOSTON, MASS.

ALBERT S. RICHEY
ELECTRIC RAILWAY ENGINEER
WORCESTER, MASSACHUSETTS
REPORTS - APPRAISALS - RATES - OPERATION - SERVICE

J. ROWLAND BIBBINS
CONSULTING ENGINEER — TRANSPORTATION
Organized Transit Development and Traffic Controls.
Economic Operation, Routing, Schedule Analyses.
Valuations, Rate Cases and Ordinances
EXPERIENCE IN 25 CITIES
2301 Connecticut Avenue Washington, D. C.

C. B. BUCHANAN, President — W. H. PRICE, JR., Sec'y-Treas. — JOHN F. LAYNG, Vice-President
BUCHANAN & LAYNG CORPORATION
Engineering and Management, Construction
Financial Reports, Traffic Surveys
and Equipment Maintenance
BALTIMORE, 1004 Citizens National Bank Bldg. — Phone: Hanover: 2142 — NEW YORK, 49 Wall Street

WALTER JACKSON
Consultant on Fares and Motor Buses
The Weekly and Sunday Pass—Differential Fares—Ride Selling
Holbrook Hall 5-W-3
160 Gramatan Ave., Mt. Vernon, N. Y.

HEMPHILL & WELLS
CONSULTING ENGINEERS
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APPRAISALS
INVESTIGATIONS COVERING
Reorganization Management Operation Construction
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McCLELLAN & JUNKERSFELD
Incorporated
ENGINEERING AND CONSTRUCTION
Examinations—Reports—Valuations
Transportation Problems—Power Developments
68 TRINITY PLACE NEW YORK

KELKER, DeLEUW & CO.
CONSULTING ENGINEERS
REPORTS ON
Operating Problems Valuations Traffic Surveys
111 W. Washington Street, Chicago, Ill.

SCARR TRANSPORTATION SERVICE, INC.
Railway and Highway Consulting Engineers
An organization of experienced engineers, prepared to assist you in the installation of highway operations as a substitute for or a supplement to your rail operations.
225 BROADWAY, NEW YORK

E. H. FAILE & CO.
Designers of
Garages— Service Buildings— Terminals
441 LEXINGTON AVE. NEW YORK

THE P. EDWARD WISH SERVICE
50 Church St. NEW YORK — *Street Railway Inspection* DETECTIVES — 131 State St. BOSTON

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

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That perplexing problem

Modern transportation is responsible for many problems—many of them complicated and requiring a very considerable amount of technical research before they can be answered with accuracy.

The trained viewpoint of engineering service, focused on these problems, will assist you in their solution.

W H Sawyer
PRESIDENT.

STEVENS & WOOD, Incorporated
Engineers and Constructors
20 Pine Street, New York
Chicago . . Youngstown, O.

A Personalized Service

Arc Weld Rail Bonds

AND ALL OTHER TYPES

Descriptive Catalogue Furnished

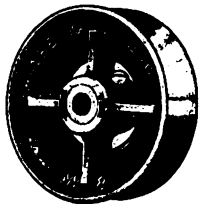
American Steel & Wire Company

CHICAGO, NEW YORK, BOSTON, CLEVELAND, WORCESTER, PHILADELPHIA, PITTSBURGH, BUFFALO, DETROIT, CINCINNATI, BALTIMORE, WILKES-BARRE, ST. LOUIS, KANSAS CITY, ST. PAUL, OKLAHOMA CITY, BIRMINGHAM, MEMPHIS, DALLAS, ATLANTA, DENVER, SALT LAKE CITY

EXPORT REPRESENTATIVE: U. S. STEEL PRODUCTS CO., NEW YORK. PACIFIC COAST REPRESENTATIVE: U. S. STEEL PRODUCTS COMPANY, SAN FRANCISCO, LOS ANGELES, PORTLAND, SEATTLE.

Kalamazoo Trolley Wheels

The value of Kalamazoo Trolley Wheels and Harps has been demonstrated by large and small electric railway systems for a period of thirty years. Being exclusive manufacturers, with no other lines to maintain, it is through the high quality of our product that we merit the large patronage we now enjoy. With the assurance that you pay no premium for quality we will appreciate your inquiries.

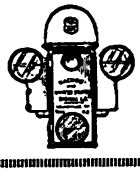


THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.

NACHOD & UNITED STATES SIGNAL CO., INC.

LOUISVILLE, KY.

BLOCK SIGNALS
FOR
ELECTRIC RAILWAYS
HIGHWAY CROSSING SIGNALS



Johnson Electric Fare Boxes

and overhead registers make possible the instantaneous registering and counting of every fare. Revenues are increased 1½ to 5% and the efficiency of one-man operation is materially increased. Over 5000 already in use.

Johnson Fare Box Co.
4619 Ravenswood Ave., Chicago, Ill.

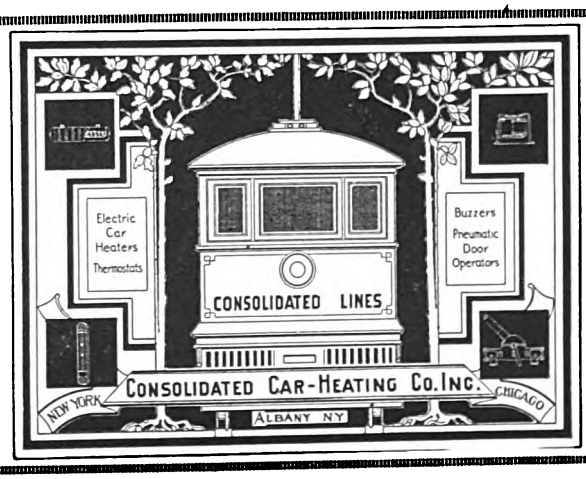
GOLD CAR HEATING & LIGHTING CO.

220 36th St., Brooklyn, N. Y.

ELECTRIC HEATERS WITH OPEN COIL OR ENCLOSED ELEMENTS
THERMOSTAT CONTROL—VENTILATORS
WRITE FOR NEW CATALOGUE

Your Name

in this space in all issues where larger display space is not used backs up your advertising campaign and keeps your name in the alphabetical index.



Send for Bulletin No. 2 *describing*

MASTER LIVE LINE TOOLS

Master Pliers, the powerful, unbreakable pliers, cost no more than ordinary types. Send for literature.

MASTER PLIER CORPORATION
7330 Harrison Street Forest Park, Illinois

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Heralding a year of activity and progress

The ANNUAL STATISTICAL ISSUE

of

Electric Railway Journal

January 12, 1929

This important issue is being awaited with even greater interest than usual. It will chronicle the achievements of a year that has seen encouraging progress. And it will forecast an increasingly optimistic picture for 1929.

The contents of the issue will include the basic statistics for 1928; a complete picture of the Industry's budgets for 1929; high spots of the year's progress in financing, construction, operation and maintenance, and a review of the advances made by manufacturers.

The advertising pages will, as usual, form an important new year exhibit of the latest in equipment, materials and supplies.

Advertising forms close JANUARY 2nd

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THIS MAN IS COMFORTABLE AT HOME

IS HE COMFORTABLE IN YOUR CARS?

When a chair at home is too near the heat or too far from the light, it can easily be *moved* into proper relation. But the seats, lights, windows and heaters on a trolley car are in a *fixed immovable position.*

Once uncomfortable upon a car—always uncomfortable. It is necessary, therefore, to bring these factors into right relation at the start and a Hale & Kilburn seating engineer, working with you from the beginning of the design of the car, will assure the maximum degree of final comfort.

We have half a century's experience to aid, not only in providing the most practical *arrangement* of these comforts, but in providing the most practical and comfortable type of *seat* for every type of city and inter-city service.

The H. & K. No. 900D Double Chair has brought street railway seating to the highest point of modern luxury and comfort. It is, however, but one of the many Hale & Kilburn styles developed to fulfill this function in all fields of transportation.

HALE & KILBURN SEATS

"A Better Seat for Every Type of Modern Transportation Service"

HALE & KILBURN COMPANY

General Offices and Works: 1800 Lehigh Avenue, Philadelphia

SALES OFFICES

Hale & Kilburn Co., Graybar Bldg., New York
Hale & Kilburn Co., McCormick Bldg., Chicago
E. A. Thornwell, Candler Bldg., Atlanta
Frank F. Bodler, 903 Monadnock Bldg., San Francisco
T. C. Coleman & Son, Starks Bldg., Louisville
W. L. Jefferies, Jr., Mutual Bldg., Richmond
W. D. Jenkins, Praetorian Bldg., Dallas, Texas
H. M. Euler, 146 N. Sixth St., Portland, Oregon
C. S. Wright Co., 66 Temperance St., Toronto, Ont., Canada

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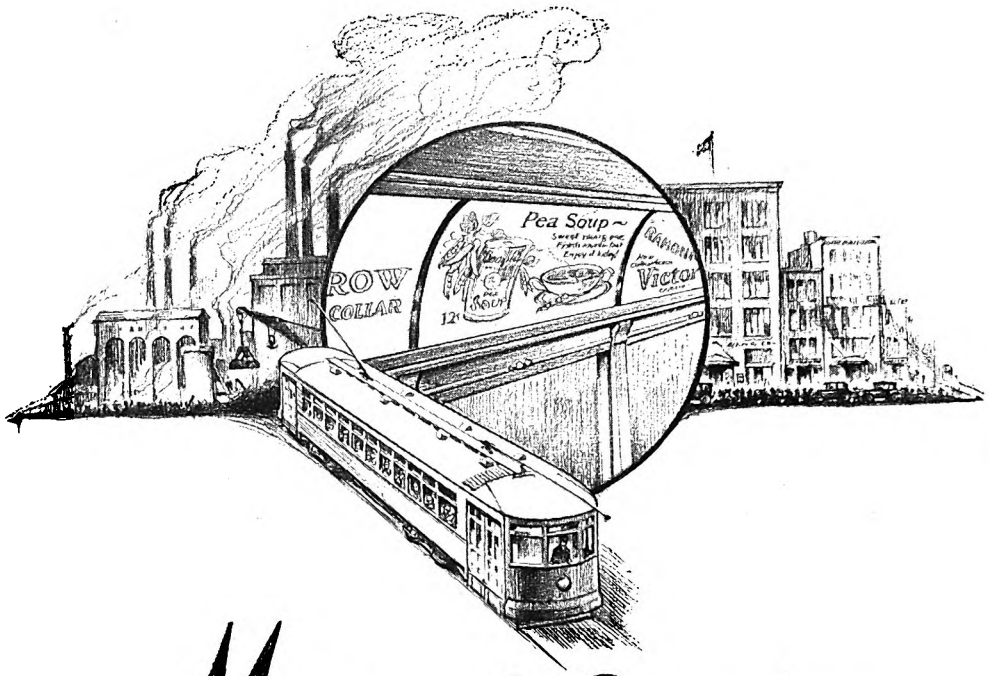

Mutual Service

TO the manufacturers and distributors of America and the street railway systems that transport the millions of America's potential buyers, Collier offers a mutual service.

This service has brought the street railway riders in thousands of cities and towns throughout the country to look upon car cards as extremely useful and pleasing features of up-to-date street car service. It has given national and local advertisers a medium thru which they can get their messages to selected territories easily, economically and convincingly.

Our business is one of service—service to the street railway industry, service to America's National and local advertisers, service to the millions of people who daily ride on street cars.

CANDLER BUILDING
NEW YORK, N. Y.

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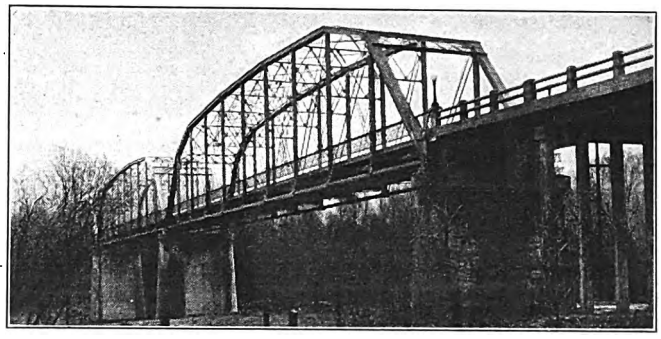
AMERICAN BRIDGE COMPANY

71 Broadway, New York



Highway Bridge across Russian River at Guerneville, Cal.

Manufacturers of Steel Structures of all classes, particularly

BRIDGES AND BUILDINGS

HIGHWAY BRIDGES

POWER HOUSES BOILER HOUSES

ROOF TRUSSES COLUMNS, GIRDERS

Offices in Principal Cities

LORAIN

Girder Rails, Special Trackwork, Switches, Frogs and Crossings in Solid Manganese Steel, Manganese Insert Construction, Chrome Nickel Steel Insert Construction and Built-up Construction of all heights and weights of rail

The Lorain Steel Company

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

General Offices: Johnstown, Pennsylvania

Sales Offices:

Atlanta Chicago Cleveland Dallas New York Philadelphia Pittsburgh

Pacific Coast Representatives: U. S. Steel Products Co., San Francisco, Seattle, Portland, Los Angeles
Export Representatives: United States Steel Products Co., New York

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DEALERS IN SCRAP METALS FOR OVER THIRTY YEARS

Heartiest Season's Greetings

To our many friends in the electric railway industry, we extend our cordial good wishes.

It is pleasant to look back over the past year and think of our old friends as well as those who during the year we have been privileged to serve for the first time.

To you all, may the coming year be prosperous — a year during which you will reap greater benefits than ever before from the good will which you, too, are fostering among those you serve.

L. Schiavone & Bonomo Bros., Inc.
Jersey City, N. J.

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WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

This index is published as a convenience to the reader. Every care is taken to make it accurate, but *Electric Railway Journal* assumes no responsibility for errors or omissions.

Advertising, Streeet Car
Collier, Inc., Barron G.

Air Brakes
General Electric Co.
Westinghouse Tr. Br. Co.

Anchors, Guy
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools
Columbia Machine Works
Elec. Service Supplies Co.

Automatic Return Switch Stands
Ramapo Ajax Corp.

Automatic Safety Switch Stands
Ramapo Ajax Corp.

Axles
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Cincinnati Car Co.
Illinois Steel Co.
Westinghouse E. & M. Co.

Babbitting Devices
Columbia Machine Works

Badges and Buttons
Elec. Service Supplies Co.
International Reg. Co., The

Barges, Steel
American Bridge Co.

Batteries, Dry
Nichols-Lintern Co.

Bearings, Anti-Friction
Timken Roller Bearing Co.

Bearings and Bearing Metals
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
Westinghouse E. & M. Co.

Bearings, Center and Roller Side
Cincinnati Car Co.
Columbia Machine Works
Stucki Co., A.

Bearings, Roller
Timken Roller Bearing Co.

Bearings, Thrust
Timken Roller Bearing Co.

Bells and Buzzers
Consolidated Car Htg. Co.

Bells and Gongs
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
Elec. Service Supplies Co.

Benders, Rail
Railway Trackwork Co.

Bodies, Bus
Brill Co. The J. G.

Bolts, Case Hardened
American Steel Foundries
Bemis Car Truck Co.

Bolts and Nuts, Track
Illinois Steel Co.

Bond Testers
American Steel & Wire Co.
Electric Service Supplies Co.

Bonding Apparatus
American Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Bonds, Rail
American Steel & Wire Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

Books
McGraw-Hill Bk. Co.

Brackets and Cross Arms (See also Poles, Ties, Posts, etc.)
American Bridge Co.
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.

Brake Adjusters
American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
Bemis Car Truck Co.
Brill Co., The J. G.

Brake Testers
National Ry. Appliance Co.

Brakes, Brake Systems and Brake Parts
American Steel Foundries
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
General Electric Co.
National Brake Co.
Safety Car Devices Co.
Westinghouse Tr. Br. Co.

Brakes, Magnetic Rail
Cincinnati Car Co.

Bridges, Steel
American Bridge Co.

Brushes, Carbon
General Electric Co.
Westinghouse E. & M. Co.

Brushholders
Columbia Machine Works
General Electric Co.

Buildings, Steel
American Bridge Co.

Bunkers, Coal
American Bridge Co.

Buses
Studebaker Corp. of America

Buses, Motor
General Electric Co.
General Motors Truck Co.

Bus Lighting
National Ry. Appliance Co.

Bushings, Case Hardened and Manganese
American Steel Foundries
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works

Cables (See Wires and Cables)

Cambric Tapes, Yellow and Black Varnish
General Electric Co.

Carbon Brushes (See Brushes, Carbon)

Car Lighting Fixtures
Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Htg. Co.
Westinghouse E. & M. Co.

Car Steps, Safety
Cincinnati Car Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co.

Cars, Gas-Electric
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

Cars, Gas, Rail
Brill Co., The J. G.

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Cincinnati Car Co.
Kuhlman Car Co., G. C.
Wason Mfg. Co.

Cars, Self-Propelled
Brill Co., The J. G.

Castings, Brass Composition or Copper
Cincinnati Car Co.
Columbia Machine Works

Castings, Gray Iron and Steel
American Bridge Co.
American Steel Foundries
Bemis Car Truck Co.
Columbia Machine Works
Standard Steel Works

Castings, Malleable & Brass
Bemis Car Truck Co.
Columbia Machine Works
Timken Roller Bearing Co.

Catchers and Retrievers, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.

Change Carriers
Cleveland Fare Box Co.
Electric Service Supplies Co.

Change Trays
Cincinnati Car Co.

Circuit Breakers
General Electric Co.
Westinghouse E. & M. Co.

Clamps and Connectors for Wires and Cables
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Cleaners and Scrapers, Track (See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
Cincinnati Car Co.

Coil Banding and Winding Machines
Columbia Machine Works
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

Coils, Armature and Field
Columbia Machine Works
General Electric Co.
Westinghouse E. & M. Co.

Coils, Coke and Kicking
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Coin Changers
Johnson Fare Box Co.

Coin Counting Machines
Cleveland Fare Box Co.
International Reg. Co., The
Johnson Fare Box Co.

Coin Sorting Machines
Cleveland Fare Box Co.
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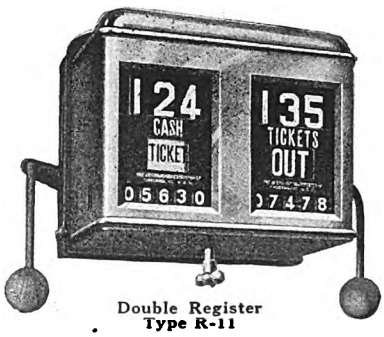

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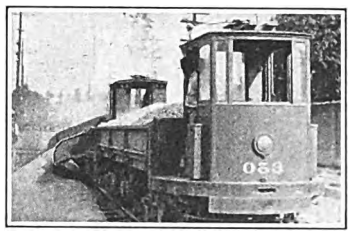

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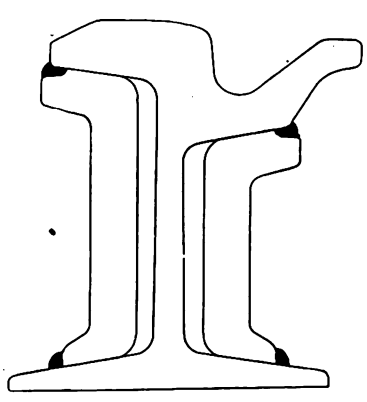

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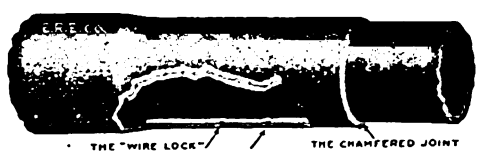

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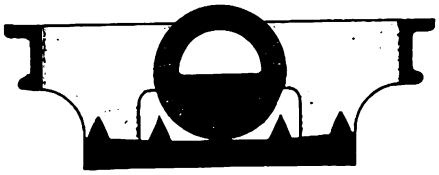

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electrified to improve suburban operation

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President L. A. Downs, of the Illinois Central, attributes much of the increased patronage to the faster and more frequent train service provided in the electrified zone.

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